

Biopsychosocial Approach for the  
Assessment and Treatment of  
Children and Adolescents who Stutter

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## **ABSTRACT**

Stuttering in childhood and adolescence can prove a difficult and debilitating communication disorder, potentially adversely affecting many aspects of an individual's life. Several researchers and clinicians have argued for a broader conceptualisation of stuttering, which aims to delineate not only the surface behaviours present in a child or adolescent's speech, but also the psychosocial impact stuttering has on their life.

Chapter 1 addressed the impact of the stuttering disorder on anxiety and inherent psychosocial variables. A review of the research specific to the relationship between stuttering and anxiety in adults, children and adolescents was provided. The conclusion was made that a fuller understanding is needed regarding this relationship between stuttering and anxiety for children and adolescents who stutter. In addition, the impact of the stuttering disorder on various psychosocial variables such as behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering, communication difficulties in daily situations, and quality of life was also explored. Further review of the literature, culminated in the identification and use of a biopsychosocial therapeutic framework developed by Yaruss and Quesal (2004; 2006) resulting in a more extensive and complete evaluation of the impact stuttering has on children and adolescents. Such an in-depth framework has not previously been incorporated into clinical research. Accordingly, the model provides one of the central tenets of this thesis. Such biopsychosocial theoretical support for the links between anxiety, psychosocial variables and stuttering severity was then presented in the context of current treatment programs.

In Chapter 2, an overview of the unique holistic biopsychosocial concurrently run Fluency & Confidence and Investing in Parents group treatment program was presented. The development and implementation of this treatment initiative was a culmination of the theoretical biopsychosocial model of Yaruss and Quesal (2004) and the clinical

expertise and practice within the Curtin University Stuttering Treatment Clinic. The importance of parental involvement and group dynamics was highlighted. In addition, the distinction was drawn between efficacy and effectiveness based treatment research in the context of a clinical setting. The purpose of this comparison between efficacy and effectiveness based treatment practices was to reinforce the use of effectiveness based research methods in this particular thesis framework.

The primary research aims of this thesis were to explore the relationships between anxiety, psychosocial variables and stuttering severity in children and adolescents who stutter. The resultant statistical and clinical significance of these findings then evolved into holistic effectiveness based treatment practices. A mixed-methods approach was used in the following four chapters to examine key principles of this biopsychosocial approach to the assessment and treatment of children and adolescents who stutter.

In Chapter 3, results for children ( $n = 39$ ) and adolescents ( $n = 36$ ) who stuttered demonstrated statistically significant higher levels of state, trait and social anxiety; higher behavioural, social and communication difficulties; and overall poorer quality of life than their fluent peers ( $n = 75$ ). These results proved theoretically and clinically significant and promoted the need for a biopsychosocial perspective when managing children and adolescents who stutter. In addition, support arose for the proposal that the stuttering disorder may impact significantly on the anxiety levels and psychosocial functioning of children and adolescents who stutter based on the various inter-relationships detailed between the severity of stuttering and these psychosocial variables.

Chapter 4 employed a mixed methods design incorporating qualitative semi-structured interviews and quantitative questionnaires to explore the barriers which precluded adolescents from attending therapy. Fifteen adolescents who chose not to participate in the group therapy program were interviewed and their qualitative data was

analysed using a phenomenological approach. The quantitative data contained within this chapter were obtained from 36 adolescents who completed 5 quantitative questionnaires 8 weeks prior to the commencement of the group therapy program. The quantitative data were separated into 2 groups: i) adolescents who accepted and participated in the group program (AWS Accept;  $n = 21$ ) and ii) adolescents who declined participation in the group program (AWS Decline;  $n = 15$ ). The implications and future clinical directives addressing commitment and participation in a holistic biopsychosocial group treatment programs were presented.

Chapter 5 further explored the relationships between anxiety, psychosocial variables and stuttering severity. This study investigated the relationships between anxiety, several psychosocial variables and stuttering severity in children ( $n = 39$ ) and adolescents ( $n = 21$ ) at a waiting list date compared to a pre-treatment date 8 weeks later. The outstanding and unexpected feature of the findings was the replicability and stability of the results across this time period. In these children and adolescents who stuttered, the fears, anxieties and distress they were experiencing, remained with them unwaveringly over a 2 month period. Other researchers have reported the difficulties of measurement in children and adolescent populations, arguing the unpredictability of the young peoples' reactions. The collective results from Chapters 3 and 5 provided consistent and reliable insight into the elevated state, trait and social anxiety; higher behavioural, social and communication difficulties; and overall poorer quality of life of the assessed children and adolescents who stuttered.

Chapter 6 detailed the effectiveness of the unique Fluency & Confidence and Investing in Parents group treatment program for children ( $n = 39$ ) and adolescents ( $n = 21$ ) who stuttered which was conducted alongside the parent ( $n = 60$ ) support group program. The most important contribution made by this effectiveness research study was the confirmation of several clinically significant treatment outcomes for this

holistic and two faceted approach. Children and adolescents who participated in the group program demonstrated clinically significant improvements in stuttering symptoms, state, trait and social anxiety and all psychosocial outcome variables. In addition, their parents reported significantly greater positive attributes in their children and more balanced perspectives on their speech, psychological, behavioural and social life skills in general. The concurrently run Fluency & Confidence and Investing in Parents group treatment programs produced large treatment effects for the children and adolescent sample population cohorts.

This thesis poignantly explored the relationships between anxiety, psychosocial variables and stuttering severity in children and adolescents who stutter. This information was then utilised to successfully expand the knowledge base regarding holistic effectiveness based treatments for children and adolescents who stutter. In addition, the effectiveness of this unique biopsychosocial group treatment program for children and adolescents who stutter which was conducted alongside the parent support group program has been demonstrated.

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**I PROMISE NOT TO DO ANOTHER PHD!!**



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## **LIST OF ABBREVIATIONS**

The following abbreviations are used throughout the thesis:

AWNS	Adolescents who do not Stutter
AWS	Adolescents who Stutter
BFNE-II	Brief Fear of Negative Evaluation Scale Revised
CUSTC	Curtin University Stuttering Treatment Clinic
CWNS	Children who do not Stutter
CWS	Children who Stutter
F & C	Fluency & Confidence
FNE	Fear of Negative Evaluation Scale
ICF	International Classification of Functioning, Disability, and Health
IIP	Investing in Parents
MRA	Multiple Regression Analysis
OASES	Overall Assessment of the Speaker's Experience of Stuttering
OASES-SI	Self-awareness of speaking ability / knowledge of stuttering
OASES-SII	Reactions to stuttering / speaking ability
OASES-SIII	Communication difficulties in daily situations
OASES-SIV	Quality of life
PWNS	People who do not Stutter
PWS	People who Stutter
%SS	Percentage of Syllables Stuttered
QoL	Quality of Life
RCTs	Randomised controlled trials
SDQ	Strengths and Difficulties Questionnaire
SLPs	Speech Language Pathologists
SOC	Stage of Change Questionnaire

STAI	State Trait Anxiety Inventory
STAIC	State Trait Anxiety Inventory for Children
WHO	World Health Organization

## **1.0 CHAPTER 1: LITERATURE REVIEW**

Stuttering in childhood and adolescence can prove a difficult and debilitating communication disorder, potentially adversely affecting many aspects of the individual's life. The young child who stutters may feel discouraged with the persistent breakdowns in communication and restrict their interactions with others (Langevin, Bortnick, Hammer, & Wiebe, 1998). School aged children who stutter may become academically delayed as a result of their avoidance of asking questions in class and their fear of being teased and bullied by other children (Davis, Howell, & Cook, 2002). The embarrassment and anxiety often felt by adolescents who stutter may impact on their ability to enjoy social repartee and meaningful interpersonal relationships, and future career and employment choices (Blood & Blood, 2004). In adulthood, the person who stutters may avoid certain occupations which require a high degree of verbal skills and interaction, which correspondingly, may lead to feelings of apprehension, failure and diminished self-worth (Bloodstein, 1995; Guitar, 1998). Research has shown that people who stutter experience status loss and discrimination, especially as they continue into the employment setting (Gabel, Blood, Tellis & Althouse, 2004; Swan, 1993).

Approximately 1% of the population stutters (Bloodstein, 1995) and given that the population of Australia is in the vicinity of 22 million, this culminates in approximately 220,000 individuals across Australia who have a stuttering disability (Australian Bureau of Demographic Statistics, June 2009). In addition, a firmly established reality of stuttering which has been documented extensively within the research literature is that stuttering frequently runs within families. Research in the area of stuttering and genetics suggests that individuals who stutter have an inherited predisposition to stutter (Guitar, 1998). It is clinically accepted that the onset of stuttering is most likely to occur between the ages of 2 and 5 years (Andrews et al., 1983; Craig, Hancock, Tran,

Craig, & Peters, 2002), and typically begins as rapid, irregular repetitions of parts of words (Ambrose & Yairi, 1999; Guitar, 1998).

Stuttering is a disorder however that embraces much more than verbal disfluency. Stuttering not only affects the forward flow of speech, but includes impairment with additional psychological and social effects (Guitar, 2006). Guitar (2006) defined stuttering as “characterised by an abnormally high frequency and/or duration of stoppages in the forward flow of speech. These stoppages usually take the form of repetitions of sounds, syllables, or one-syllable words; prolongations of sounds; or ‘blocks’ of airflow or voicing in speech” (p.13). Additional nonverbal symptoms may include such accessory factors as facial grimacing, fixed articulatory postures, or eye closure. There are often unobservable features repeated by the individual such as obvious fear during speech attempts, and anticipation of speech failure prior to speech attempts (Sheehan, 1975). Sheehan articulates these overt and covert symptoms of the stuttering disorder, as analogous to an iceberg (Sheehan, 1975). The audible and visible signs of stuttering constitute the tip of an iceberg that is apparent above the water level. Yet, more weighty and powerful is the insidious submerged portion, which incorporates feelings from fear, shame, guilt, anxiety, hopelessness, isolation, to outright denial in the person who stutters.

Theories attempting to explain and embrace the scope of the phenomenon of stuttering have resounded through history. A comprehensive account summarised by Bloodstein (1995) included a famous yet flawed description by Aristotle, who believed that stuttering was due to an “abnormality of the tongue”. The emergence of psychoanalysis in the 19<sup>th</sup> century profoundly changed the ethos of health and behaviour and with this mantle, Freud explained stuttering as resulting from an “oral-anal fixation” on the part of the patient (as cited in Adams, 1969).



By contrast, in contemporary research, there is consensus that stuttering is viewed primarily as a disorder of speech motor planning with psychosocial aetiological theories being neglected (Bloodstein, 1995). It has been suggested that many psychosocial variables may impact upon the sophisticated speech motor skill process (Conture et al., 2006; Zimmerman, Smith, & Hanley, 1981). The particular role of one fundamental variable, anxiety, is a matter of extensive debate (Alm & Risberg, 2007; Craig, 1990; Craig, Hancock, Tran, & Craig, 2003; Craig & Tran, 2006; Menzies, Onslow, & Packman, 1999). In addition, the impact on the individual's emotional, cognitive and social well-being and their ability to engage in treatment is addressed in the following thesis.

Theories of stuttering are important as they represent different perspectives of the phenomenon and can ultimately affect how the disorder is evaluated and treated. Knowledge of the aetiology of a disorder increases the ability to evaluate accurately, prescribe effective strategies and ultimately treat the enigmatic features of this disorder. However, it is clear that in order to effectively treat the stuttering disorder it is important to examine not only the overt symptoms of the disorder but also to holistically evaluate other components such as the speaker's affective, behavioural and cognitive reactions; the environmental impact of stuttering indicated by the difficulty of different speaking situations and the reactions of others; and the overall impact of stuttering on the speaker's life indicated by the limitations in communication activities and restrictions in participation in daily life.

Based on a review of the literature, it has evolved that many theorists have implicated anxiety as a hallmark feature which impacts on the psychosocial fabric of the person who stutters (e.g., Bloodstein, 1987; Brutten & Shoemaker, 1967; Johnson, 1942; Sheehan, 1975). It has been highlighted because the relationship between stuttering and anxiety has been the topic of a considerable body of research. However,

a contemporary, integrated, holistic biopsychosocial model of stuttering proposed by Yaruss and Quesal (2004) outlines other features deserving of investigation. More recent treatment approaches for stuttering incorporate such a holistic framework and therefore underscores the significance of the integrated model. Such is the foundation for the development and implementation of the group programs used extensively at the Curtin University Stuttering Treatment Clinic (CUSTC). These programs address the needs of children and adolescents with specific guidelines for the involvement of their families.

## **1.1 Anxiety and Stuttering**

### **1.1.1 Adulthood Anxiety and Stuttering**

Anxiety is agreed upon as an aversive emotional and motivational state which occurs in circumstances perceived as threatening (Eysenck, Derakshan, Santos, & Calvo, 2007). Anxiety is a negative emotion which is often dichotomised into state, trait, and social anxiety components (Bennett, 2006; Kraaimaat, Vanryckeghem & Van Dam-Baggen, 2002). State anxiety is considered to be specific to a given situation. The unpleasant emotional arousal presents in demanding situations and may be triggered by factors associated with social interaction (Ezrati-Vinacour & Levin, 2004; Davis, Shisca & Howell, 2007). Trait anxiety by comparison is conceptualised as an inherent, stable characteristic of an individual. It refers to an individual's general level of anxiety, regardless of situational factors that are likely to evoke anxiety (Menzies et al., 1999; Kraaimaat et al., 2002). It has been proposed that in contrast to state anxiety, trait anxiety develops gradually over time (Ezrati-Vinacour & Levin, 2004). Social anxiety “involves the persistent fear of embarrassment and humiliation, with the sufferers avoiding participating in events they think may be potentially distressing” (Craig & Tran, 2006, p.65). However, in relation to stuttering, these three constructs are neither discrete nor unitary. In support of an interactional model of state-trait anxiety,

researchers have suggested that people who stutter (PWS) are not born with higher trait anxiety levels, but that over time repeated negative social experiences (increased state anxiety) coalesce, giving rise to a condition of chronic anxiety (i.e., trait anxiety). In addition, social anxiety may become so entrenched that the individual comes to develop a clinical level of generalised anxiety that often incites severe stress and impedes functioning, thus implying a relationship between trait anxiety and social anxiety (Ezrati-Vinacour & Levin, 2004).

In the 1980s several researchers (Andrews et al., 1983; Ingham, 1984; Bloodstein, 1987) reviewed research concerning anxiety and stuttering and agreed in their conclusions that little scientific evidence had been found for a systematic and predictable relationship between anxiety and stuttering.

Since these published reviews there have been further important research studies concerning anxiety and stuttering carried out with adults who stutter. The pursuit to disambiguate the direction and magnitude of the relationship between stuttering and anxiety has long been confounded by the complex and enigmatic nature of the two variables (Blood, Blood, Bennett, Simpson, & Susman, 1994; Bloodstein, 1995; Craig, 1990; Craig & Tran, 2006; Ezrati-Vinacour & Levin, 2004; Fitzgerald, Djurdjic, & Maguin, 1992; Miller & Watson, 1992; Poulton & Andrews, 1994; Weber & Smith, 1990).

The consensus of the majority of recent research studies in adults who stutter suggest that stuttering is associated with significantly elevated levels of state, trait and social anxiety (Alm, 2004; Craig, 1990; Craig et al., 2003; DiLollo, Manning, & Neimeyer, 2003; Ezrati-Vinacour & Levin, 2004; Kraaimaat, Janssen, & Van Dam-Baggen, 1991, 2002; Mahr & Torosian, 1999; Messenger, Onslow, Packman, & Menzies, 2004). From a pragmatic stance, it seems logical that a disorder that causes involuntary disruption to a person's verbal utterances during speaking, and that has the

potential to elicit ridicule, embarrassment, frustration and/or pity from listeners, would be associated with some degree of fear, anxiety and/or frustration (Bloodstein, 1995; Lincoln, Onslow & Menzies, 1996; Menzies et al., 1999; Reitzes, 2006).

Whilst the general consensus amongst Speech Language Pathologists (SLPs) and adults who stutter is that anxiety is involved in stuttering (Lincoln et al., 1996), the findings are divergent in terms of the role anxiety plays in the aetiology, manifestation and maintenance of the disorder (Ezrati-Vinacour & Levin, 2004; Kraaimaat, Janssen & Van Dam-Baggen, 2002). In a high proportion of these recent research studies which have investigated anxiety levels, PWS seeking or who had initiated treatment for their stuttering were assessed (Craig & Tran, 2006). It has been suggested in these research studies that PWS who seek treatment appear to stutter more severely than PWS who do not seek treatment, and that perhaps, as a consequence, those who seek treatment present with elevated anxiety levels (Craig et al., 2003).

Craig (1990) found that PWS experienced state anxiety specific to speaking situations prior to treatment, as well as overall higher levels of trait anxiety than people who did not stutter (PWNS), regardless of whether they had received treatment. Craig (1990) reported that following their involvement in an intensive behaviour therapy program, trait anxiety scores of PWS regressed to normal levels. This finding has significant theoretical implications. According to Endler and Parker (1990), trait anxiety is a fixed personality characteristic. This definition lends to the assumption that, if elevated anxiety is indeed a trait characteristic of PWS, then irrespective of the remediation or successful management of the disorder, elevated anxiety levels shall endure (Davis et al., 2007). In view of Craig's (1990) findings one might argue that in the area of stuttering, trait anxiety, by traditional definition, is null and void.

Craig et al. (2003) investigated trait anxiety levels among PWS and PWNS within the framework of a randomised population study. The researchers phone 4, 689 random

households across New South Wales between 1995 and 1996 in order to identify a random and demographically representative group of PWS. Sixty-three PWS age 15 years and above completed the Trait Anxiety subset of the STAI (STAI-Trait) over the telephone. Trait anxiety data for the stuttering group was compared to trait anxiety data obtained from 102 aged- and sex-matched non-stuttering persons involved in an earlier study by Craig (1990). The PWS were shown to be significantly more anxious than the non-stuttering controls. The PWS cohort was then sub-divided based on involvement in ( $n = 18$ ) or no exposure ( $n = 33$ ) to past treatment. No significant effect for treatment was found; hence the authors concluded that PWS are at risk of developing higher levels of trait anxiety irrespective of exposure to treatment.

Ezrati-Vinacour and Levin (2004) examined the relationship between stuttering and state-trait anxiety within Endler's multidimensional interactional framework (Endler, Edwards, & Vitelli, 1991; Endler, Parker, Bagby, & Cox, 1991). Forty-seven male PWS recruited from various stuttering treatment clinics were tested across various measures of state and one measure of trait anxiety. Like Craig (1990) and Fitzgerald, Djurdjic & Maguin (1992), the PWS were found to exhibit significantly greater trait anxiety than PWNS with the authors concluding that anxiety is a personality trait of people who stutter (Ezrati-Vinacour and Levin, 2004). The authors also found that state anxiety in social communication was higher among severe stutterers as compared to mild stutterers and fluent speakers, therefore deducting that state anxiety was related to stuttering severity (Ezrati-Vinacour and Levin, 2004).

Kraaimaat et al. (1991) also found differences between PWS and PWNS on both state and trait anxiety measures. Kraaimaat and colleagues (1991) compared levels of social anxiety among PWS, social phobic patients, and PWNS. They found that PWS were significantly more anxious than normal subjects but significantly less anxious than the social phobic patients.

In contrast, Peters & Hulstijn (1984) compared a group of 24 adults who stutter with 24 adults who do not stutter across a general measure of trait anxiety derived from the neuroticism scale and neurotic somatic complaints scale of the Amsterdam Biographical Questionnaire (Wilde, 1963). In view of the non-significant results the authors concluded that stuttering is not associated with increased general trait anxiety (Peters & Hulstijn, 1984). These findings corroborated those of Sheehan (1970), and were corroborated by Miller and Watson (1992) who found no differences between PWS and PWNS on state or trait anxiety, as measured by the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, & Lushene, 1970).

In summary, the general findings when reviewing the research literature regarding the relationship between anxiety and stuttering in adults who stutter evince the reality of a relationship (Menzies et al., 1999). However it is important to note the methodological differences between each of the studies reviewed in this section. There were differences in the construct of anxiety, participant numbers and treatment status which may explicate some of the different results obtained between each of the studies reviewed (Menzies et al., 1999).

It is clinically accepted that PWS do indeed experience increased levels of state anxiety termed “communication apprehension” compared to PWNS, particularly in social situations (Lincoln et al., 1996; Messenger et al., 2004; McCroskey, 1978). However, the findings are divergent in terms of the role that anxiety plays in the aetiology, manifestation and maintenance of the disorder (Ezrati-Vinacour & Levin, 2004; Kraaimaat et al., 2002). The familiarity of negative emotions in association with speaking experiences of the past serves to condition communication apprehension (Alm, 2004). In support of this claim, several studies have confirmed the presence of negative communication attitudes in PWS (Baumgartner & Brutton, 1983; Bloodstein, 1975; Vanryckeghem & Brutton, 1996). Bloodstein (1975) surveyed PWS regarding their

state anxiety related to communication situations and found that anxiety played a role in increasing disfluency. Miller and Watson (1992) found that the communication attitudes of PWS appeared to deteriorate with heightened self-ratings of stuttering severity. Additional findings indicated that PWS with mild to moderate stuttering severity exhibited a significant positive correlation between measures of communication attitudes and both state and trait anxiety. Conversely, PWS with severe stuttering showed no significant correlations between anxiety and communication attitudes. Worthy of note is the premise that PWS underestimate the severity of their communication apprehension, possibly as a form of denial (Pennbaker, 1990; Sackeim & Gur, 1978).

The preceding overview demonstrates that the direction and magnitude of the relationship between stuttering and anxiety has long been confounded by the complex and enigmatic nature of the two variables (Blood et al., 1994; Bloodstein, 1995; Craig, 1990; Craig & Tran, 2006; Ezrati-Vinacour & Levin, 2004; Fitzgerald et al., 1992; Miller & Watson, 1992; Poulton & Andrews, 1994; Weber & Smith, 1990). The general findings to emerge from the extensive body of authoritative research evince the reality of a relationship in adults who stutter (Menzies et al., 1999). Hence, from a clinical point of view, routine inclusion of anxiety management strategies in stuttering treatments would be beneficial.

### **1.1.2 Childhood & Adolescent Anxiety and Stuttering**

Some anxiety disorders such as separation anxiety, social phobia, and generalised anxiety may occur early in a child's development (Treon & Dempster, 2006). Several researchers such as Sawyer et al. (2001) have suggested that up to 20 percent of children in the general population may be affected by psychological disturbances, such as anxiety or depression. Even more alarming is the finding that, at preschool age, the

prevalence of psychiatric disorders is estimated to be between 10 to 15 percent, and persists into adolescence (Briggs-Gowan, Carter, Irwin, Wachtel, & Cichetti, 2004; Konold, Hamre, & Pianta, 2003; McGee, Feehan, & Williams, 1995; Warren, Huston, Egeland, & Sroufe, 1997).

In a study conducted in 1998, researchers assessed anxiety levels in school children aged between 8 to 12 years using a measurement called the Spence Children's Anxiety Scale (SCAS) which was administered verbally and reported in writing (Spence, 1998). The SCAS has been reported to examine the frequency of anxiety symptoms which are characteristic of specifically diagnosed anxiety disorders. The five separate categories of anxiety measured by this questionnaire are social phobia, separation anxiety, generalised anxiety, obsessive-compulsive disorder, and fears of physical injury. It was reported that overall, the children who were younger reported greater levels of anxiety than the older children, with the exception of social phobia symptoms. In a later study (Spence, Rapee, McDonald, & Ingram, 2001) investigated the subtypes of anxiety in preschool children ranging in age from 2 to 6 years using a parent questionnaire, known as the Preschool Anxiety Scale (Parent Report) (Spence & Rapee, 1999). The scale includes a wide variety of anxiety symptoms typically noted in preschoolers. Preschool children showed no significant differences in generalised anxiety levels according to sex (Spence et al., 2001). Groups of factors denoting the same five distinct types of anxiety were described as closely correlated. This indicates a lack of ability to differentiate between these disorder types at an early age. Hence, although symptoms tended towards different categories of anxiety disorders, preschoolers appeared to experience more generalised anxiety, which separate into a distinct type of anxiety disorder later in childhood (Spence et al., 2001).

Related research has assessed children diagnosed with a speech disability and have demonstrated that these children have an increased risk of developing anxiety



disorders in early adulthood (Baker & Cantwell, 1987). It has been suggested that the development of anxiety disorders in early childhood coincide with the initial emergence of stuttering (Wingate, 2002). The body of research specific to anxiety in children who stutter (CWS) is limited, with the majority of research undertaken with younger CWS in the form of questionnaire studies administered to parents of CWS or direct verbal questioning of CWS. Fowlie and Cooper (1978) provided an adjective checklist to mothers of 34 CWS and 34 children who do not stutter (CWNS). It was found that mothers of CWS tend to describe their children as overall more anxious compared to mothers of typically developing children. The mothers of CWS perceived their children as being significantly more anxious, introverted, fearful, sensitive, withdrawn and insecure. In another earlier study, Andrews and Harris (1964) directly examined anxiety in CWS and CWNS using Sarason's General Anxiety Scale for Children (Sarason, Davidson, Lighthall, Waite, & Ruebush, 1960) and found no significant differences between groups.

In an attempt to delineate the role of anxiety in the progression of stuttering, Craig and Hancock (1996) compared 96 older children and adolescents who stutter aged 9-14 years with 104 age and education matched children and adolescents who do not stutter using the State-Trait Anxiety Inventory for Children (STAIC) (Spielberger et al., 1970). No significant difference was found between the two groups in either state or trait anxiety, yet differences in communication fears were observed, with older CWS found to be more apprehensive of and negative toward communicative interactions (Craig & Hancock, 1996). The authors concluded that anxiety may be less common in CWS compared to adults who stutter. The authors inferred that heightened trait anxiety may not be a latent characteristic of children who stutter, but rather, may develop as a result of an accumulation of actual and perceived negative social communicative experiences (Craig & Hancock, 1996; Craig & Tran, 2005; Ginsberg, 2000).

Further research which assessed the anxiety levels of adolescents who stutter (AWS) have supported the results of Craig and Hancock (1996). Blood, Blood, Maloney, Meyer and Qualls (2007) administered the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 2002) to 36 AWS and 36 AWNS aged between 12 to 18 years and found that AWS, although generally recording higher levels of generalised anxiety compared to their fluent peers, still scored within normal limits. However, those AWS with concomitant speech-language disorders (e.g., articulation, phonology, expressive language, receptive language, SLI), or other disorders (e.g., central auditory processing, attention deficits, behavioural disorders, reading problems, neurological disorders) experienced greater levels of generalised anxiety than AWS without co-occurring disorders.

Davis et al. (2007) compared state and trait anxiety measures derived from the State-Trait Inventory for Children (STAIC) (Spielberger, 1973) across three groups of children and adolescents aged between 10-17 years: those with a persisting stutter; those whom had recovered from their stutter; and a control group of fluent speakers. Participants were first identified as stutterers and non-stutterers. The stuttering group then received treatment, and 24 months later, the stuttering severity of each was reviewed and participants assigned to either the persisting or recovered group, with the STAIC administered to all. The results suggested that children and adolescents who stutter have higher state anxiety than children and adolescents who do not stutter, however they found no differences in trait anxiety between children and adolescents who stutter, children and adolescents who had recovered from stuttering, and fluent peers aged between 10 and 17 years.

In a more recent study, Mulcahy, Hennessey, Beilby, and Byrnes (2008) observed that adolescents who stutter between the ages of 11 and 18 years were found to have statistically significantly higher levels of state, trait and social anxiety than fluent

speaking controls. State and trait anxiety were significantly associated with difficulty in communication in daily situations for adolescents who stutter, but not for control fluent peers. No statistically significant associations were found between anxiety and measures of communication difficulty, and the severity or typography of stuttering surface behaviours. The authors concluded that these findings highlighted some of the psychosocial concomitants of chronic stuttering in adolescence and supported the need for a holistic biopsychosocial perspective when assessing and treating adolescents who stutter.

The polarised results of these studies (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety in people who stutter may in fact be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering, state and trait anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004).

### **1.1.3 Anxiety and Fear of Negative Social Evaluation**

Contrary to the traditional state-trait anxiety dichotomy, a contemporary model of anxiety holds that state and trait anxiety are both multidimensional and interactive, consisting of various components including social evaluation (Endler, Edwards, & Vitelli, 1991). It is suggested that global measures may not adequately capture the

particular aspects of anxiety that are directly related to stuttering (Menzies et al., 1999). In the ongoing development of measurement procedures for anxiety in individuals who stutter, attention needs to delineate exactly what components of anxiety and its determinants should be measured.

Endler, Edwards, Vitelli and Parker (1989) emphasise the role of social evaluation in the expression of trait anxiety. Central to the experience of social anxiety is the fear or the perception of being negatively evaluated (Carleton, Collimore & Asmundson, 2007; Clark & Wells, 2007). Secondary features include; a bias for the detection of social-evaluative threats, reduced confidence in one's perceived social skills, and heightened shyness and diminished self-esteem (Carleton et al., 2007). There is significant overlap between the social evaluation dimension of trait anxiety (Endler et al., 1989) and the fear of negative evaluation underlying the construct of social anxiety (Carleton et al., 2007).

Within the clinical psychology literature, expectancy of harm has been included as a key construct in anxiety measurement (Beck & Emery, 1985; Endler et al., 1991; Eysenck et al., 2007; Messenger et al., 2004). Alm and Risberg (2007) argue for the need to reconceptualise trait anxiety as a secondary feature of social anxiety. They suggest that PWS score higher on tests of trait anxiety not because they are inherently more anxious than PWNS, but because they experience heightened levels of social anxiety associated with particular speech situations. Messenger, Onslow, Packman and Menzies (2004) compared 34 PWS recruited from the waiting list of a Sydney Speech Pathology clinic to 34 PWNS on two measures of expectancy of social harm: the Fear of Negative Evaluation Scale (FNE) (Watson & Friend, 1969), and the Endler Multidimensional Anxiety Scales-Trait (EMAS-T) (Endler et al., 1991). The PWS group scored significantly higher on the FNE than the control group, indicating higher levels of expectancy of social harm (Messenger et al., 2004). On the EMAS-T the PWS

group scored significantly higher only on those two dimensions associated with people and social interactions. The authors intimated that in a clinical population of PWS, trait anxiety is not an infinite state, but rather, an epiphenomenon of social anxiety (Alm & Risberg, 2007; Messenger et al., 2004). This fear of being negatively evaluated by others, particularly in social situations, is described as social anxiety (Messenger et al., 2004). In individuals who stutter, social anxiety is not surprising, given the likely negative evaluation of speech that has been experienced for some time (Messenger et al., 2004).

Mahr and Torosian (1999) compared symptoms of social anxiety, including fear of negative evaluation, among a group of 22 PWS to data from a previously gathered sample of social phobics and non-patient controls. The authors failed to find a significant main effect of group on fear of negative evaluation scores. However, scores on the Social Avoidance and Distress Scale (SAD), which quantifies the experience of distress in social situations and avoidance of those situations (Watson & Friend, 1969), and scores on the Self-Rating Anxiety Scale (SAS), which measures overall anxiety (Zung, 1971), were significantly higher for PWS than controls. The authors interpreted the findings as evidence of an interactional relationship between social distress, avoidance, fear of negative evaluation and trait anxiety (Mahr & Torosian, 1999). They argued that PWS and PWNS both fear negative evaluation, but PWS experience higher levels of trait anxiety and display increased social avoidance secondary to their fear (Mahr & Torosian, 1999).

Kraaimaat et al. (2002) examined the incidence of social anxiety in PWS via the administration of the Inventory of Interpersonal Situations (IIS) (Van Dam-Baggen & Kraaimaat, 1999). Compared to PWNS, PWS exhibited significantly greater levels of emotional tension and significantly lower frequency of social activity as measured on the Discomfort and Frequency scales of the ISS respectively, with no significant

difference in self-esteem. Approximately 50 percent of the scores of PWS feel within the range of a group of highly socially anxious psychiatric patients, suggesting social anxiety may be pathological in a sub-group of PWS. The researchers concluded that PWS differ from PWNS in terms of negative emotional experience of and reactions to social situations, irrespective of levels of positive self-esteem (Kraaimaat et al., 2002). If the Discomfort measures of the IIS relate directly to the perception of social evaluation and social evaluation is a substrate of trait anxiety, one might infer that since PWS display higher levels of emotional discomfort in socially-related settings, they are higher in trait anxiety.

Whilst these studies seem to imply a relationship between trait anxiety and social anxiety, some limitations can be identified. For example, the Messenger et al. (2004) study awaits replication, with few researchers aside from Poulton and Andrews (1994) having considered the role of expectancy of social harm in the scrutiny of the relationship between stuttering and anxiety. Sample bias is also prevalent in all three studies due to the over-reliance on the recruitment of stuttering participants seeking treatment. In the Mahr and Torosian (1999) study data from the comparison groups were obtained from normative data generated nearly 30 years before the study was conducted, increasing the change of generational and cultural between-group differences. Also as all three studies targeted an adult demographic, one cannot apply the findings to populations of children and adolescents who stutter.

There is direct evidence that fluent children as young as 3 years can recognise stuttering in their peers and that they may evaluate stuttering negatively as early as 4 years of age (Ezrati-Vinacour & Levin, 2004). Parental reports have indicated that CWS are aware of their stuttering shortly after its onset, and thus the potential to affect social interaction occurs from an early age (Ambrose & Yairi, 1994; Packman, Onslow & Attanasio, 2003). Although research evaluating the relationship between anxiety and

stuttering in CWS is limited, there is evidence to support a difference in communication apprehension between CWS and CWNS (De Nil & Brutton, 1990, 1991; Vanryckeghem & Brutton, 1996, 1997; Vanryckeghem, Brutton, & Hernandez, 2005; Vanryckeghem, Hylebos, Brutton, & Peleman, 2001). CWS as young as 3 and 4 years have been found to experience more negative attitudes towards speech than CWNS, and these negative attitudes appear to worsen with age and stuttering severity (De Nil & Brutton, 1990, 1991; Vanryckeghem, 1995; Vanryckeghem & Brutton, 1997; Vanryckeghem et al., 2001, 2005). In contrast, such attitudes tend to improve with age among CWNS (Vanryckeghem, 1995; Vanryckeghem & Brutton, 1997). Vanryckeghem et al. (2005) piloted the Communication Attitude Test for Preschool and Kindergarten Children Who Stutter (KiddyCAT) (Vanryckeghem & Brutton, 2007), a self-report measure of communication attitudes for preschoolers, in 45 CWS aged 3 to 6 years and 63 sex and age-matched CWNS. They found that the CWS group displayed significantly more negative communication attitudes than their non-stuttering peers. Vanryckeghem et al. (2005) concluded that the communication attitudes of CWS differed at the onset of stuttering, which is consistent with the finding that both preschool aged CWS and CWNS are aware of the differences between fluent and stuttered speech (Ambrose & Yairi, 1994; Ezrati, Platzky, & Yairi, 2001). There is a culmination of demonstrable evidence that confirm the presence of state anxiety, based on communication apprehension in CWS at the onset of stuttering.

In adolescents who stutter, only one study to date has attempted to measure both traditional trait and state anxiety and a fear of negative evaluation (Mulcahy et al., 2008). The researchers compared 19 adolescents who stutter and 18 of their fluent peers on the Fear of Negative Evaluation (FNE) scale and the State-Trait Anxiety Inventory (STAI). The authors concluded that adolescents who stutter displayed significantly higher state, trait and fear of negative evaluation than did control

participants. In addition, the FNE scores were found to correlate significantly with trait anxiety measures, further implicating an interactional relationship between trait anxiety and focal measures of social anxiety (Alm & Risberg, 2007). It is inferred that whilst other researchers have demonstrated that children and adolescents may not experience significantly higher levels of trait anxiety as measured via traditional instruments which conceptualise trait anxiety as a unitary construct (Blood, Blood, Tellis & Gabel, 2001; Craig & Hancock, 1996; Davis et al., 2007), AWS may indeed experience increased expectancy of social harm and fear of social evaluation which is a dimension of trait anxiety.

#### **1.1.4 The Mediating Role of Social Anxiety on Stuttering Events**

The actual role that social anxiety and its determinants have in contributing to a discrete stuttering event remains unclear. Results from recent studies suggest that anxiety may play a mediating role in the disorder, as determined by interplay between variables such as communication attitude and apprehension (Davis et al., 2007; Messenger et al., 2004). The communication-emotional model of stuttering (developed by Conture et al., 2006) supports this mediating role of anxiety. The model suggests that distal contributors to stuttering, such as genetics, serve as the foundation for proximal variables, such as speech planning, to trigger stuttered events. Conture et al. (2006) further suggest that any events resulting from speech planning and production are influenced by emotional arousal and regulation, including anxiety. This proposal was supported by the effects of arousal on speech motor planning. Anxiety and its determinants were therefore suggested as mediating or exacerbating instances of stuttering including its surface features, severity and typography (Conture et al., 2006).

Considering the relationship between communication and anxiety, it appears that social anxiety may mediate the surface features of stuttering events in daily



communication (Messenger et al., 2004). Limited evidence exists for such a relationship although it has been supported in a range of research studies (Alm & Risberg, 2007; Blood et al., 2007; Conture et al., 2006; Davis et al., 2007; Messenger et al., 2004). A study by Davis et al. (2007) found that individuals with persistent stuttering had higher state anxiety than did participants in the control or recovered stuttering group, which may provide experimental evidence for the suggested mediating role of anxiety in stuttering.

### **1.1.5 Anxiety and Severity of Stuttering**

Direct evidence evaluating the impact of anxiety on the severity of stuttering is limited. If social anxiety is a consequence of chronic stuttering, the impact on communicative evaluation may be increased for those with more severe stuttering behaviours. The mediating role of increased social anxiety on the speech motor control system may impact upon stuttering events, particularly for those participants with more severe stuttering behaviours. If this association is valid then the severity of stuttering may be mediated by social anxiety.

Studies addressing such associations have examined the link between anxiety and severity of stuttering. Craig et al. (2003) reported that adults with more severe stuttering, measured by the calculation of percentage of syllables stuttered, were not significantly more anxious than those who had less severe stuttering, however, the findings were limited to trait anxiety and the role of state and social anxiety was not investigated. Results from a study by Blood et al. (2007) demonstrated no significant correlations between the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 2002) and the severity of stuttering in AWS. A recent study by Mulcahy and colleagues (2008) in AWS also found no significant associations between anxiety and severity of stuttering.

The results from Blood et al. (2001), however, showed the severity of stuttering as measured by the Stuttering Severity Instrument (Riley, 1994) to be significantly, positively correlated with communication apprehension in adolescent participants. If the mediating effects of social anxiety are dependent on severity, existing studies have failed to conclusively demonstrate a consistent relationship.

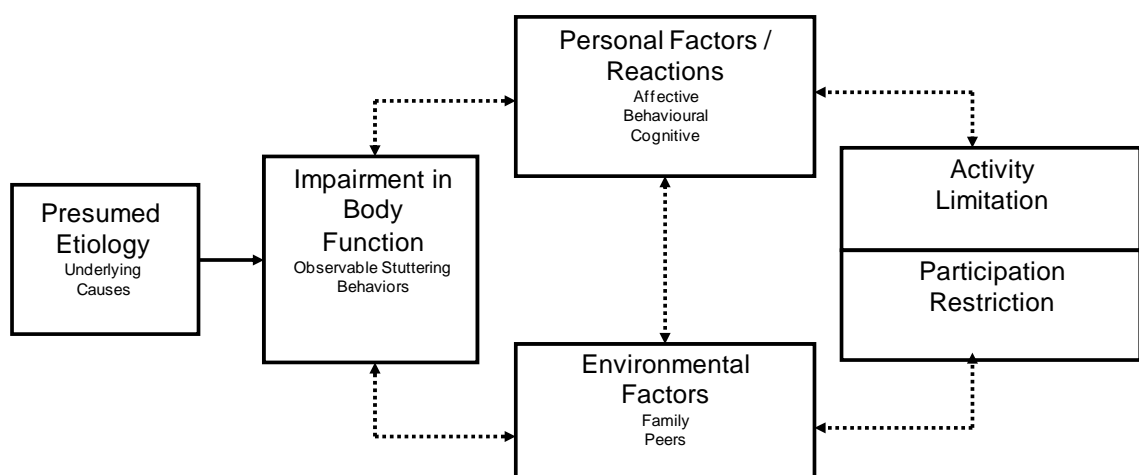
In conclusion, the general findings to emerge from the extensive body of authoritative research evince the reality of a relationship between anxiety and stuttering in adults who stutter (Menzies et al., 1999). In the case of children and adolescents who stutter, the polarised results of these studies (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety may in fact be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering, state and trait anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004).

Hence, from a clinical point of view, routine inclusion of anxiety management strategies in stuttering treatments when treating children, adolescents and adults who stutter would be beneficial. In addition, when assessing and treating children and adolescents who stutter, the impact of various additional psychosocial variables such as behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering,

communication difficulties in daily situations, and quality of life on the severity of stuttering would also provide insight therapeutically.

## 1.2 Biopsychosocial Model of Stuttering

Several researchers and clinicians have argued for a broader conceptualisation of stuttering, which aims to delineate the surface behaviours present in an individual's speech, but also the psychosocial impact or consequences stuttering has on their life (Cooper & Cooper, 1996; Gabel, 2006; Quesal, 1989; Rustin, Cook & Spence, 1995; Yaruss & Quesal, 2004; 2006). Yaruss and Quesal (2004) analysed the multidimensional nature of the International Classification of Functioning, Disability, and Health (ICF) presented by the World health Organization (WHO) as it related to stuttering. The authors stated that the International Classification of Functioning, Disability, and Health, when adapted, is an effective tool in relation to looking at the stuttering disorder because it considers factors that are beyond the observable characteristics of the impairment of stuttering. Aside from the physiological deficits of stuttering, personal factors, environmental factors, and the individual's performance in life activities are all components in this holistic biopsychosocial model of stuttering.



**Figure 1.1:** Reproduced schematic version of the Yaruss and Quesal (2004) model adaptation. Cited by Yaruss and Quesal (2006, p. 94).

The integrated holistic biopsychosocial model of stuttering developed by Yaruss and Quesal (2004) (see Figure 1.1) proposes that the stuttering disorder be viewed in terms of several interacting components. Such components include the *biological* which consists of the presumed aetiology or underlying causes of the disorder and impairment in the body function indicated by the observable characteristics of stuttering; *psychological* which includes the speaker's affective, behavioural, and cognitive reactions to stuttering; *social* which includes the effects of the environment on stuttering, indicated by the difficulty in different speaking situations and the reactions of others; and the *overall impact* of stuttering on the speaker's life, as indicated by the limitations in communication activities and restrictions in participation in daily life. Yaruss and Quesal (2004) proposed that because this biopsychosocial model describes the totality of the stuttering disorder it is a foundation for the development of a comprehensive measurement instrument that may be used both in daily treatment and in outcomes research. The ultimate evolution is the development of a more holistic approach to the treatment of stuttering in the future.

In 2006, Yaruss and Quesal constructed a paper-and-pencil instrument for adults who stutter called the Overall Assessment of the Speaker's Experience of Stuttering (OASES; Yaruss & Quesal, 2006; 2008). Recently, the adult OASES questionnaire has been revised resulting in the development of a version for school-aged children (OASES-S) (Yaruss, Coleman & Quesal, 2007a) and for adolescents (OASES-T) (Yaruss, Coleman & Quesal, 2007b). The OASES questionnaire was developed to assess the negative consequences associated with stuttering. These consequences are described in terms of the speaker's *reactions* to stuttering, the impact of stuttering on their *functional* communication in daily situations, and the impact of stuttering on their overall *quality of life* (Yaruss & Quesal, 2006; Yaruss, Pelczarski & Quesal, 2010). An

overview of these potential consequences associated with stuttering are described in detail below.

### **1.2.1 Personal Reactions**

The personal reactions identified include affective, behavioural and cognitive reactions to stuttering. Children, adolescents and adults may experience a variety of *affective* or emotional reactions to their stuttering (e.g., Yaruss, 1998; Cooper, 1993; DeNil & Brutten, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutten, 1996; 1997; Watson, 1988; Yaruss & Quesal, 2004, 2006). Within the stuttering literature, personal reactions include feelings of embarrassment, anxiety and fear, shame and guilt, anger, isolation and loneliness, inadequacy, and other negative emotions accompanying stuttered speech (Cooper, 1993; Vanryckeghem et al., 2001; Watson, 1988; Yaruss & Quesal, 2006). In children and adolescents, these personal reactions may pose particular challenges given that the young person may not possess coping skills necessary for managing these strong emotions without assistance. It follows that the incorporation of strategies to manage these personal reactions is a necessary part of a holistic approach to stuttering therapy.

Individuals who stutter may also exhibit *behavioural* reactions to stuttering including physical tension and struggle as speech is forced through moments of stuttering and effort (e.g., Johnson, 1961; Van Riper, 1982; Wingate, 2002). Similarly, behavioural reactions develop from avoidance or escape behaviours, in which the child or adolescent may attempt to minimise exposure to difficult speaking situations. They may avoid reading aloud in class; ordering food for themselves in public; or talking on the phone to friends or extended family. In addition, they may circumlocute, word avoid or word substitute during daily conversational exchanges. Although these avoidance behaviours may decrease stuttering in the short-term, the child or adolescent

who avoids such speaking situations is eventually compromised in the key activities that are important for educational or social development (Murphy, Quesal, & Gulker, 2007). Again, such personal and behavioural reactions impose difficulties for the child or adolescent in their attempts to communicate effectively and need to be addressed in effective holistic treatment programs.

Other cited personal reactions include *cognitive* reactions such as low self-esteem, diminished self-confidence, and reduced feelings of self-efficacy (Blood & Blood, 2004; Healey & Scott, 1995; Manning, 2001; Ramig & Bennett, 1995; 1997; Ramig & Dodge, 2005; Reardon-Reeves & Yaruss, 2004; Starkweather & Givens-Ackerman, 1997; Vanryckeghem et al., 2005; Yaruss, 1998; Yaruss & Quesal, 2004; 2006). Because self-esteem and self-confidence can have a broader impact on the child or adolescent's life in areas not related to stuttering, it is important to address these reactions through the treatment process.

Conture (2001) has remarked on the dearth of empirical research in the affective, behavioural and cognitive domains and has proposed two reasons for this scarcity. Firstly, he posited that there was a lack of clarity regarding the best and most systematic way to measure nonverbal behaviours, and secondly, he described the confusion regarding how the affective, behavioural and cognitive reactions manifest themselves in each person's cognitive and affective profiles. Yaruss and Quesal (2004; 2006; 2008) proposed and developed this biopsychosocial model and the adjoining OASES questionnaire to assist clinical researchers in describing and conceptualising the possible consequences of the stuttering disorder and the outcomes of stuttering treatment.

### **1.2.2 Environmental Reactions**

The ability of a child or adolescent to communicate effectively in a variety of every day speaking situations is not necessarily determined by the amount of stuttering

that they are exhibiting in that given situation. It is affected by how completely the child or adolescent is able to convey their spoken message in each situation. Communicating effectively can be diminished if gains in fluency are achieved through avoidance or through the use of speaking techniques that are so burdensome and unnatural that the young person has difficulty using them on a consistent basis. In treatment, maintaining an emphasis on effective communication which focuses on emotional support as well as the acquisition of speaking techniques is imperative (Murphy, Quesal, Gulker, 2007; Murphy, Yaruss, & Quesal, 2007a, 2007b; Yaruss, Coleman, & Hammer, 2006).

The focus on total and effective communication challenges clinicians to address the variability that children and adolescents who stutter exhibit in their stuttering behaviours. Researchers have commented on the differences in stuttering frequency that can be observed over time and across different speaking situations (see Costello & Ingham, 1984; Yaruss, 1997). Such variability can challenge treatment significantly because a child or adolescent's ability to use a given strategy within the clinic may not translate to their ability to generalise the same technique in another setting, such as the classroom or at home. Variability is often addressed in treatment through the use of situational hierarchies and generalisation plans to ensure that speakers can use techniques across a variety of situations (Brutten & Shoemaker, 1967; 1974; Darley & Spriestersbach, 1978; Shumak, 1955; see also Hillis & McHugh, 1998; Ingham & Onslow, 1987). The situational differences are viewed less in terms of the effect they have on the child or adolescent's fluency and more in terms of the effect they have on the child or adolescent's ability to convey their message and speak freely, regardless of the amount of stuttering they exhibit. These reactions are framed in terms of functional communication (Frattali, 1998) rather than in terms of stuttering frequency, and

addressing functional communication represents a significant and positive focus for the future of stuttering treatments.

Effectively coping with stuttering involves a myriad of support. The biopsychosocial framework posed by Yaruss and Quesal (2004) emphasises the inherently powerful relationship that the environment has on the person and ultimately on their ability to cope effectively in their daily interactions. This model also emphasises the importance of support networks and relationships that PWS have and the impact they have on the person's ability to function in the real world.

The family is the primary support network for the child or adolescent who stutters and is responsible for the development of the primary relationships that people experience. The family, through their reactions and relationships with the person who stutters, can have a positive impact, providing support and positive guidance in teaching life management and coping skills, or they can have a negative impact, hindering the development of positive life management techniques.

The home environment is formative in the development of parent child interactions in childhood stuttering (Yairi, 1997). Yairi advocates researching more routinely the home environment of the child who stutters and cautions that the home environment may contain potential personal difficulties for the child who stutters. Such difficulties ultimately affect the emotional development and well-being of the child.

Crowe and Cooper (1977) studied specific attitudes toward stuttering reported by 50 parents of CWS compared to 50 parents whose children did not stutter. Parents were administered the Parental Attitudes Towards Stuttering Inventory and the Alabama Stuttering Knowledge Test. Results indicated that parents of CWS reported more undesirable attitudes towards stuttering than did parents of children without stutters (Crowe & Cooper, 1977). These undesirable attitudes reported by parents of CWS may have a significant impact within the home environment and may hinder the ability of



children who stutter to develop positive management skills and ultimately feelings of self-empowerment.

Bergstrom (2001) discussed the importance of such a family dynamic on stuttering per se and proposed that the organization of the family can be modified in order to produce positive change. The author wrote, “We cannot isolate the individual from his environment when we discuss stuttering and we need to observe the interaction between the stuttering child and his family in order to understand how the problem develops and manifests itself and how it is affected by and affects the family” (Bergstrom, 2001, p. 141). Bergstrom (2001) advocated that clinicians need to view the entire family unit when assessing the child that stutters and concluded that although clinicians may not always be able to change the speech of the child who stutters, they can change the environment in which the child is raised so that positive changes can be made to assist the child to cope with their stuttering (Bergstrom, 2001).

Family relationships are the first and most important interactions that a child who stutters develops entering school. The beliefs that family members have regarding stuttering may greatly influence a person who stutters’ ability to construct a positive social identity. Incorporating family members into the therapeutic process is important in comprehensive treatment programs. However, it is crucial for the clinician to have an accurate and valid understanding of family dynamics in order to involve family members as appropriate and relevant support agents in therapy.

### **1.2.3 Quality of Life**

Stuttering has far-reaching and sometimes devastating effects on a child or adolescent’s life. Stuttering can affect the child or adolescent’s overall quality of life (Frattali, 1998) and result in negative emotional and cognitive reactions to communicating in daily living situations. Quality of life (QoL) refers to the well-being

of an individual from a multidimensional perspective including a variety of domains of the life such as physical, psychological, social, and vocational aspects.

While it has been noted by researchers that QoL is a potentially important measure when assessing the impact of stuttering and the efficacy or effectiveness of therapeutic treatments (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig, Blumgart & Tran, 2009), QoL research assessing the impact of stuttering on QoL has only recently been undertaken (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Franic & Bothe, 2008; Craig et al., 2009).

Klompas and Ross (2004) used an in-depth interview procedure to study the life experiences of a small group of adults who stuttered and the perceived impact stuttering had on their quality of life. Multiple assessment measures were used including employment, self-esteem, marital and family status, and emotional and social function. It was concluded that stuttering did not seem to impact negatively on the quality of the marital and family dynamics; however stuttering was found to have a significant and negative influence on emotional stability and self-esteem.

Craig, Blumgart and Tran (2009) used a measure of QoL entitled the Medical Outcomes Study Short Form-36 (SF-36) for 200 adults who stuttered and 200 normally fluent adults. Their findings indicated that stuttering does have a negative impact on QoL in the domains of vitality, social functioning, emotional functioning and mental health status. In addition, results from this study suggested that adults who stutter who have an increased level of stuttering severity may have a higher risk of poor emotional functioning.

Many PWS have described how stuttering has posed restrictions on entitlements such as diversifying their career choices, job promotions, participating in social events, developing friendships, and succeeding in school (Hayhow, Cray, & Enderby, 2002; Hugh-Jones & Smith, 1999; Yaruss et al., 2002). Children and adolescents in particular

have experienced negative reactions in the form of school yard bullying and teasing (Blood & Blood, 2004; Davis et al., 2002; Langevin, 1997, 2000; Langevin et al., 1998; Murphy & Quesal, 2002; Murphy, Yaruss. & Quesal, 2007a, 2007b; Yaruss, Murphy, Quesal, & Reardon, 2004). Such life frustrations, may negatively affect the person's full participation in vocation and recreational opportunities.

Successful treatment outcomes ensure that stuttering does not have a crippling negative outlook for the child or adults. Improvements in quality of life can still be achieved even if the child continues to stutter to some extent following treatment. If the child or adolescent knows how to manage tension and conflict during disfluent speech, if they experience minimal negative reactions, or if they can communicate competently in a broad range of speaking situations, then the ultimate impact of stuttering on the child or adolescent's overall quality of life will be greatly reduced. Such outcomes result in the child or adolescent who may still exhibit the stuttering behaviour but who does not experience a stuttering disorder.

When recalling the experience of stuttering and its impact, individuals who stutter consistently describe a variety of negative emotions, struggle, avoidance, and restriction across many and varied aspects of their lives. Research regarding the experience of stuttering summarises that the experience of stuttering as one of suffering (Corcoran & Stewart, 1998; Plexico, Manning, & DiLollo, 2005). Suffering results from experiences such as humiliation, dread, and social isolation which ultimately results in feelings of helplessness, hopelessness, shame and fear. Such descriptions of the stuttering experience go beyond the surface features of the disorder and delve into the impact on the quality of life or wellbeing of the person. Such experiences of stuttering cannot be fully understood without taking into account the cognitive and affective reactions of people who stutter and their global life experiences with the disorder (Plexico et al., 2005).

A culmination of the research findings to date has implications for the assessment and treatment of children and adolescents who stutter with specific emphasis on assessing and treating the biopsychosocial consequences of stuttering. Research to date focusing on the treatment of children and adolescents who stutter has relied heavily on the assessment and treatment of the stuttered behaviours with less emphasis on the psychosocial aspects of the stuttering disorder.

### **1.3 Treatment Programs for Children and Adolescents who Stutter**

The final portion of this thesis (Chapter 6) is an evaluation of the effectiveness of the concurrently run Fluency & Confidence and Investing in Parents Group program, therefore, it is appropriate to examine some previous research regarding school-age child and adolescent treatment programs which have been conducted in speech pathology clinical practice and those that have incorporated a biopsychosocial approach to the treatment of children and adolescents with stuttering disorders.

The treatment programs presented below are four contemporary treatment approaches used by clinical researchers for school-age children and adolescents who stutter. These four contemporary treatment approaches were chosen to illustrate different theoretical models resulting in the treatment and measurement of diverse clinical outcomes. In addition, similarities across the therapeutic approaches common to each of the four treatment programs are elucidated.

#### **1.3.1 Lidcombe Program for School Age Children Who Stutter**

The Lidcombe program is a parent administered behavioural treatment programme originally designed for use with pre-school aged children up to 6 years of age who have been stuttering for at least 1 year. The origins of the Lidcombe program can be traced to single-subject laboratory experiments which demonstrated that response

contingent stimulation reduced stuttering in preschool-age children (Martin, Kuhl, & Haroldson, 1972; Reed & Godden, 1977).

The Lidcombe program for school-age children who stutter is an adaptation of the Lidcombe program for preschool children and has been used for children between the ages of 6 and 12 years with few modifications from the preschool version (Harrison, Bruce, Shenker & Koushik, 2010; Koushik, Shenker, & Onslow, 2009). The evidence obtained from these research studies suggests that a higher variability exists when measuring stuttering behaviour treatment outcomes of school age children compared to preschool children as the treatment program concludes (Koushik et al., 2009; Lincoln, Onslow, Lewis, & Wilson, 1996).

The evidence supporting the Lidcombe program for school age children is relatively modest compared with the evidence for the Lidcombe program for preschool children. Lincoln et al. (1996) published the first report on the Lidcombe program for this age group, with a cohort of 11 children aged 7 to 12 years. Multiple pre- and post-group measures were made, showing that all the children made substantial gains in fluency and that, for the most part, these gains continued during a 1 year maintenance program. However, the results of this study must be interpreted with caution as 4 of the 11 children did not complete maintenance and no data was presented to establish that fluency gains continued after the maintenance programme was over. Koushik et al. (2009) reported on 12 children between the ages of 6 and 10 years who had been treated using the Lidcombe program. The mean percentage syllables stuttered (%SS) decreased from 9.2% at the beginning of treatment to 1.9% at follow-up which was measured at a mean of 6 months post-group after stable fluency was achieved. At follow-up, 7 of the 12 children had %SS scores below 2% SS while the remaining 5 had scores below 4% SS. In both of these reports, the fluency of the school age children was found to be

more variable in the maintenance phase compared to that of preschool children treated with the Lidcombe program.

### **1.3.2 The Fluency Rules Program**

Runyan and Runyan (1993; 2010) developed a treatment program for school-aged children based on methods found to be effective in the treatment of adults who stuttered. The program's ultimate goal is that of natural-sounding fluent speech. The original treatment program outlined 10 rules designed to teach children to speak fluently using a natural sounding pattern. These rules included directive advice such as "speak slowly," or "say a word one time" (Runyan & Runyan, 1999, pp. 161).

The evidence for the effectiveness of the Fluency Rules program included a study by Runyan and Runyan (1991) in which they reported on 9 children between the ages of 3 and 7 years, treated in a public school setting. Follow-up assessments of these children for 1 to 2 years indicated that all children achieved and maintained significant improvement in fluency, normal speaking rate and eliminated all secondary behaviours although it was noted that the children still showed mild repetitions of one to two iterations.

### **1.3.3 Smooth Speech and Cognitive Behavior Therapy**

The main goals of the Smooth Speech and Cognitive Behavior Therapy approach are to teach clients smooth speech (a fluency shaping treatment and variant of prolonged speech) and psychological skills (social skills and communication attitudes) to assist them in improving their ability to communicate and interact with others. The theoretical basis of this approach is two-fold. The first assumption is that that stuttering arises from a neurophysiologic deficit which can be compensated for by the use of fluency management skills such as slow rate and gentle onset of phonation which alter the entire

pattern of speech initiation. The second assumption is that for older children, stuttering has interweaved psychological factors, such as anxiety and avoidance, which have become associated with the speech of the child after years of failure and frustration with compromised communication. A variety of cognitive-behavioural techniques such as muscle relaxation and social skills training are incorporated to treat children and young adolescents between 9 and 14 years who stutter (Craig, 2010).

The evidence which supports the effectiveness of this combined treatment approach is detailed primarily in two studies (Craig et al., 1996; Hancock et al., 1998) whereby the change in %SS at various time-points (pre treatment, immediately post treatment, 1 year post treatment, and 5 years post treatment) was assessed. The results detailed in these research studies indicate that at both 1 year, and 2 - 6 years post treatment, the mean %SS for both clinic-based and home-based treatments was approximately 3% SS.

#### **1.3.4 Comprehensive Treatment for School-Age Children Who Stutter**

The Comprehensive Treatment approach (Yaruss et al., 2010) to managing stuttering in school aged children and adolescents incorporates a holistic psychosocial approach which is focused on the behavioural, cognitive and affective responses to stuttering. It is proposed by the authors of this treatment program that the various responses a child or adolescent may have towards their stuttering behaviour may compromise their communication effectiveness because of self-consciousness regarding social conversations and consistent situational avoidance. In addition, this communication dysfunction may lead to reduced quality of life for children and adolescents who stutter because of restricted participation in wide ranging academic, social or occupational opportunities.

The Comprehensive Treatment approach was designed to be used with children and adolescents between the ages of 7 and 17 years. The investigations to date include published studies of some of the sub-components of this comprehensive treatment approach (Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006), which have resulted in a reduction in the severity of stuttering and changes in negative reactions to stuttering. The findings from these studies suggest that clinicians can assist children to overcome bullying and other negative reactions associated with stuttering through the implementation of well-supported treatment strategies that can be taught in a variety of clinical and real-life situations.

### **1.3.5 Summary of Treatment Approaches for School-Age Children Who Stutter**

The four treatment approaches which have been detailed embrace different theoretical models. The Lidcombe program for school age children aims to facilitate the child's everyday fluency through parent verbal contingencies for fluent speech (praise) and for stuttered speech (request for correction), without any directions to the child regarding how to achieve the fluency. The Fluency Rules program also endeavours to teach children natural-sounding fluent speech, however direct instructions to the child are implemented, in addition to rewards and speech corrections. The children taught within the Fluency Rules program are specifically taught to slow down their rate of speech, to say words only once (rather than letting repetitions persist), and to say words briefly (rather than prolongations of sounds). In addition, children with severe stuttered speech are taught specific techniques such as proper breathing control, gentle onsets of phonation, and light articulatory contacts to facilitate fluency.

The goals for Smooth Speech with Cognitive Behavior Therapy are more holistic and encompassing than for the two previous programmes. Such goals include direct control of the stutter (rather than simply learning to talk fluently), in association with an



improvement in social skills and communication attitudes. In this treatment program, control of stuttering is taught using a hierarchy of systematically controlled rate and prolonged speech quality that is eventually shaped into normal sounding speech. Additional techniques such as muscle relaxation are taught to assist the child or adolescent to manage the physiological forcing and effects that accompany more severe stuttering. Cognitive behavioural techniques such as positive self-talk are used to support the child or adolescent to improve their attitudes towards communication and social life skills. The target population for this treatment program is older children and adolescents who have been stuttering for a longer period of time compared to younger school-age children which are the target of the Lidcombe and Fluency Rules programs. It is the premise of the authors of this treatment program that older school-age children need to be supported and counselled regarding their negative reactions to their communication, with specific support provided for avoidance of speaking and social isolation (Bloodstein & Bernstein Ratner, 2008).

In older children and adolescents, it is the long term modification in the nature of the stutter to more entrenched chronic stuttering in addition to the life consequences of the disorder which underpins the Comprehensive Treatment approach and aims to help children become effective communicators rather than exclusively fluent speakers. Children and adolescents are taught to modify stuttered moments by reducing the rate of their speech and physical tension which results in a desensitization to environmental stimuli that previously elicited fear and anxiety. Consequently, they are assisted to have different perspectives about their past and future speaking experiences. This Comprehensive Treatment approach has the broadest objectives of the four contemporary treatment approaches presented and hence may approximate most closely to one of Bloodstein's famous criteria for effective treatment: "Treatment must remove

not only stuttering, but also the fears, the anticipations, and the person's self-concept as a stutterer" (Bloodstein, 1987, p. 405).

The four contemporary treatment programs are presented sequentially in terms of the specific focus of the measured clinical outcomes. The Lidcombe program is the most insular directed towards fluent speech; the Fluency Rules program focuses on fluent speech, however employs additional techniques and strategies to modify stuttering for children as appropriate; Smooth Speech and Cognitive Behavior Therapy targets fluency in association with social life skills and communication attitudes; and finally, the Comprehensive Treatment program approaches stuttering treatment from a holistically psychosocial based perspective and prioritises effective communication and the alleviation of negative reactions associated with stuttering while still placing emphasis on fluency as a clinical goal.

Despite the theoretical differences in goals, activities, and age ranges embraced by these four contemporary treatment programs, there are also similarities between these treatment programs in the nature of the positive reinforcements provided for successful change. All four treatment programs use positive reinforcement for the targeted behaviours that the clinician would like to increase. The Lidcombe program delivers verbal contingencies (praise for fluency and requests for correction of stuttering), and the Smooth Speech and Cognitive Behavior approach employs token economy rewards to children for completing stages of the program. Fluency Rules and the Comprehensive Treatment programs are less systematic in schedules of delivery but use positive consequences such as verbal praise, and opportunities to take play breaks to reinforce desired behaviour. Whether fluency goals and stuttering treatment outcomes are affected by how systematically reinforcement is scheduled and delivered and how naturally it is delivered to children in different speaking environments remains inconclusive.

Another clinical administration component common to the four treatment programs is the use of task and situational hierarchies in helping children acquire and use new behaviours. Such hierarchies embrace universal principles of learning, and are used to assist the child to achieve mastery of new behaviours and generalise these behaviours into beyond clinic speaking situations. The use of hierarchies are intrinsic in the Lidcombe program's transitions from structured to unstructured conversations and from the standard weekly clinic session in Stage 1 to the gradually intermittent sessions of Stage 2. The hierarchy organization in the Fluency Rules, Smooth Speech and Comprehensive Treatment programs are, on the other hand, more structured, especially in the latter two approaches, where hierarchies are used both in the initial learning of complex behaviours and in the systematic generalisation of these behaviours to everyday real-life situations.

An additional similarity across the four treatment programs is the degree to which the child's parents are involved in the treatment process. It is common within stuttering treatment programs that the parents are involved either at the beginning of the treatment program as active change agents or alternatively, once increased fluency has been achieved, parents are involved as part of the inherent generalisation and maintenance of treatment program effects. Both the Lidcombe program and the home-based version of the Smooth Speech and Cognitive Behavior Therapy program require the parent to be the child's clinician, and Craig et al. (1996) suggested that the home-based version may have been slightly more effective because of the parent's role as the clinician. This is particularly significant given the older age of the children in the research on the home-based cohort (i.e., a mean age of 10.5 years with a range of 9 to 14 years), indicating that even adolescents respond effectively to their parent as their speech clinician. In the clinic-based Smooth Speech and Cognitive Behavior program, parents also assume an active role from the commencement of the treatment program

through facilitating the child's practice of fluency skills at home. The Fluency Rules program also involves parents and other family members, however this does not happen until after fluency skills are learned within the clinic and the child begins work on transferring these skills to other everyday environments. It is noted that throughout the transfer and maintenance phases of Fluency Rules treatment program, parents are increasingly included in order to maintain natural facilitation and cueing of their child's fluency skills at home. Family involvement in the Comprehensive Treatment program is different compared to the previous three treatment programs. In this treatment program, emphasis is placed on parents' understanding of the nature of the stuttering and acceptance that the child may always stutter to some extent during their life-span. In this treatment program, rather than assist the child to practice fluency skills, parents of children in the Comprehensive Treatment program strive to create an environment in which stuttering is accepted and allowed, thereby liberating the child to communicate freely with and without stuttering.

Finally, the four treatment programs presented in this Chapter are all directed towards school aged children who face the challenges of stuttering. Two of these treatment approaches are applicable to an age range that many regard as the most difficult to treat, namely older children and adolescents (Craig et al., 1996). A common factor among these approaches is the involvement of the parents, the use of hierarchies to establish and master the therapeutic skills and to generalise the new learnt behaviours, in addition to the use of a variety of schedules of reinforcement to facilitate changes in behaviour. The fluency goals for the first two treatment program approaches described, Lidcombe and Fluency Rules programs, are more stringent than the goals of the latter two approaches, Smooth Speech and Comprehensive Treatment programs. While the first two treatment programs aim predominantly for natural fluent speech, the latter two treatment programs aim in addition to assist children to reduce or modify

stuttering and improve their overall social life skills and communication attitudes and effectiveness. These differences in the aims of the various treatment programs documented may be influenced by the targeted age range of the different clinical approaches.

#### **1.4 Chapter Summary**

This literature review commenced with an overview of the proposed impact of anxiety on the stuttering disorder in adults, children and adolescents who stutter. The general findings to emerge from the extensive body of research evince the reality of a relationship between anxiety and stuttering in adults who stutter (Alm, 2004; Craig, 1990; Craig et al., 2003; DiLollo et al., 2003; Ezrati-Vinacour & Levin, 2004; Kraaimaat et al., 1991, 2002; Mahr & Torosian, 1999; Menzies et al., 1999; Messenger et al., 2004). In the case of children and adolescents who stutter, the polarised results of these studies (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety may in fact be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering, state and trait anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004).

A recent holistic biopsychosocial model of the consequences of stuttering proposed by Yaruss and Quesal (2004) was then presented. This model of stuttering

does not propose causal principles but rather a theory about how the disorder manifests itself in the lives of people who stutter. This model describes stuttering as a broad-based and multi-factorial disorder in which “stuttering is more than stuttering” (Yaruss, 1998; 2007; Reardon-Reeves & Yaruss, 2004; Yaruss and Quesal, 2004, 2006) and reinforces the premise that the experience of stuttering for people who stutter involves far more than the production of stuttered behaviours.

Finally a review was provided of four contemporary therapeutic programs for school age children and adolescents who stutter with specific attention paid to the involvement of family and other important supportive relationships for clients. The four treatments presented were aimed at children and adolescents who face the challenges of stuttering not only at home, but also in their school environment and everyday social interactions. Common among these approaches was the involvement of family, the use of hierarchies to establish mastery of skills and the generalisation the new behaviours in everyday life, plus the use of various kinds of schedules of reinforcement for evoking positive changes in behaviour. The first two programs aim to produce natural fluent speech, whereas the last two programs aim to help children reduce or control stuttering and improve their communicative effectiveness.

## **1.5 The Present Thesis**

The remainder of this thesis is divided into six chapters. Chapter 2 presents an overview of the innovative concurrently run Fluency & Confidence (F & C) and Investing in Parent (IIP) Group Program which was developed and implemented at the Curtin University Stuttering Treatment Clinic (CUSTC). Chapter 3 presents a cross-sectional analysis of the relationship between anxiety, psychosocial variables and stuttering severity obtained from 75 children and adolescents who stutter. These 75 individuals were drawn from the F & C Group Program Wait-List and were assessed 8

weeks prior to commencement the group intervention program. In addition, a cohort of seventy-five age and sex matched children and adolescents who did not stutter were compared according to the same psychosocial variables. Chapter 4 presents a qualitative and quantitative assessment of 21 AWS who accepted, participated and completed the F & C group program compared to 15 AWS who expressed preliminary interest in the treatment program however then declined the invitation to attend the group program. Chapter 5 presents a comparison of the relationship between anxiety, psychosocial variables and stuttering severity obtained from 60 children and adolescents who stutter at Wait-List and Pre-Group time-points (8 weeks apart). Chapter 6 presents an evaluation of the effectiveness of the concurrently run Fluency & Confidence and Investing in Parents group treatment program for 60 children and adolescents who stutter and 60 of their accompanying parents who participated in the concurrently run IIP group program. Chapter 7 summarises the thesis with conclusions and implications for future clinical and theoretical research directions.

## **2.0 CHAPTER 2: FLUENCY & CONFIDENCE & INVESTING IN PARENTS GROUP PROGRAMS**

A group treatment program holistic and biopsychosocial in nature has evolved from the clinical practices at the Curtin University Stuttering Treatment Clinic (CUSTC). An 8-week concurrently run Fluency & Confidence (F & C) and Investing in Parents (IIP) Group Program was developed which contained components which embodied the biopsychosocial model of Yaruss and Quesal (2004) and embraced a holistic multi-disciplinary approach through the integration of Speech Pathology and Clinical Psychology practices. The ultimate goal of such a clinical initiative was to address the relatively neglected population of school aged children and adolescents for whom early speech pathology intervention for stuttering had not proven to be effective.

The program targeted 8 – 17 year old children and adolescents who stuttered with the aim of treating the stutter but equally and importantly empowering them through the integration of Fluency Techniques and Confidence Life Skills.

### **2.1 Resource Manual Overview and Components**

#### **2.1.1 Parent Participation in Treatment**

Parent responsibilities in the successful management of stuttering are well documented and the consensus of many experienced clinicians who have achieved therapeutic success with young children who stutter is that parental involvement in treatment is crucial (Bottrill, Kelman, & Rustin, 1991; Conture, 1990, 2001; Conture & Schwartz, 1984; Ham, 1986; Johnson, Brown, Curtis, Edney, & Keaster, 1967; Peters & Guitar, 1991; Riley & Riley, 1983; Rustin, 1987; Starkweather, Gottwald, & Halfond, 1990). Since stuttering is typically a developmental disorder beginning in early childhood and parents are the most influential factors in the child's learning, it is essential that successful intervention requires the participation of the parents. Through



nurturing and education, parents provide their children with an important foundation on which values, beliefs and ideas are built, exchanged and transferred. In addition, parents provide their child with working models of relationships and interactions with people around them (Engels, Finkenauer, Deković & Meeus, 2001).

Rustin and Cook (1995) indicate that, if there is any realistic chance for therapeutic success, the parents must play a major role and they state that “without the involvement of parents, clinicians become powerless to help the child beyond the confines of the clinic room” (Rustin & Cook, 1995, p. 135). Ramig (1993) has supported this stance by stating that without the parent’s investment in helping their child in therapy, the effects of treatment are likely to deteriorate and not be maintained.

Parental involvement not only assists the child in making behavioural and cognitive changes but also permits support and education for the parents themselves. Through counselling and parent group contact, the parents can accumulate the necessary information to become stronger and more confident in helping their child (Rustin & Cook, 1995).

Clinicians assist parents in various ways to transfer the gains obtained in the clinical setting to the broader aspects of the child’s life. Clinicians assist parents in understanding the stuttering disorder and making informed, effective therapeutic decisions by providing information about the various behavioural models. One of the primary roles of the clinician is to help demystify stuttering and educate the parents extensively regarding their child’s stuttering disorder. Parents are informed and counselled that, although the aetiology of stuttering is still under debate, a great deal is known about the features of stuttering and several techniques are available which can address their child’s difficulties. The purpose of this detailed information is to empower the parents in becoming more knowledgeable and familiar with the stuttering features

and possible fluctuations, which better places them to make intuitive and helpful responses to their child.

Given the onset and the nature of early stuttering, parents, by omission or commission, often believe they have somehow caused the difficulties (Conture, 1990, 2001; Peters & Guitar, 1991; Rustin, 1987; Van Riper, 1982). As Ramig (1993) suggests, one of the important roles of clinicians should be the demystification and reduction of the possible feelings of guilt by the parents. The parent group support meetings provide an invaluable forum for dealing with these fears, frustrations and concerns.

Clinicians also assist parents of children who stutter to understand that, as a group, they behave no differently than parents of normally speaking children. Parents are provided with information which documents that no evidence exists for the view that the parental interaction style is related to the severity of a fluency disorder. Furthermore, they are provided with information which states that no relationships occur between stuttering severity at initial assessment and parental conversational behaviours of speech rate, frequency of questions, or interruptions (Bernstein Ratner, 1993). Additional researchers support this stance with their findings that parents of CWS do not produce significantly more requests for verbal responses than parents of CWNS (Weiss, 1993; Weiss & Zebrowski, 1992), and parents of CWS do not demonstrate psychological differences when compared to the parents of CWNS (Adams, 1993).

An additional important role of parental involvement is that of observer and participant in the process of therapeutic change. The participation of both parents would provide the ideal circumstances to promote therapeutic change; however there is to date minimal research on the role of the father in this process. Ramig (1993) proposed that if only one parent is able to take part, the outcome of the therapy is still likely to be more

beneficial for the child compared to no parental involvement. The integration of the parental involvement in the therapeutic process is a gradual one. Initially within the clinical setting, the parents begin by observing the interaction of their child and clinician. The clinician also demonstrates strategies for facilitating the child's fluency and modifying moments of stuttering. The parents then gradually participate in this process with the clinician and the child and eventually interact and assume responsibility for the treatment with their child on their own.

As discussed in Chapter 1, most treatment programs for children attempt to incorporate an active role for the parents in the therapeutic process. The achievement of high levels of parental understanding, learning, and commitment is a fundamental goal throughout the treatment process. The natural result of the parental involvement in this therapeutic process is a reduction of parental anxiety given their understanding and participation in their child's treatment program. Through the educative process, acknowledgement and effective management of stuttering by the parents occurs.

### **2.1.2 Group Approach to Treatment**

It has been suggested by Conture (2001) that a decrease in the occurrence of group therapy programs for individuals who stutter was a consequence of the increased use in the 1970s of directive behavioural modification techniques. These therapeutic techniques prescribed the use of individual therapy protocols, and evolved into an emphasis on a "bottom line mentality" (p.289) which rationalised more so the time and cost of treatment.

Various clinical researchers have discussed in detail the benefits of group therapy programs for people who stutter. Luterman (1991) describes the two main types of groups for people who stutter as therapy groups and counselling groups and that group programs for individuals with fluency disorders typically serve both functions. It has

been suggested that the group setting provides the perfect opportunity for enhancing and maintaining change of both the surface and intrinsic aspects of the stuttering difficulties. In addition, the group setting may be the only vehicle for the individual who stutters to understand that they are not alone. The group may also provide a social support setting where the person who stutters and their parents or significant others can discuss their stuttering difficulties openly and place such difficulties into perspective.

Several components of the group therapy environment embrace and extend the individual treatment initiatives and provide an ideal setting for practice, generalization and divergent thinking as individuals have the opportunity to observe how others have dealt with similar difficulties (Levy, 1983). In addition, the support that the group environment provides in terms of understanding, motivation, and courage is the cornerstone of successful group practice (Egan, 2007).

Other important benefits of the group therapeutic environment include a setting where a person who stutters can feel supported. They often constitute the only environment, compared to the community at large, in which there will not be penalties for stuttering. The structure provided by a group setting may provide the individual with the opportunity to practice the techniques learned during the treatment sessions. Conture (2001) proposes that in some instances, group environments can also provide important social and speaking opportunities for people who might not communicate with others for days or weeks. The group setting may provide a supportive audience for gaining confidence during communicative activities such as public speaking, practicing introductions, role-playing, discussion, and debating.

Group interactions also provide the clinician with the indispensable opportunity to monitor the progress of the individual who stutters in a social context (Conture, 2001). When the group treatment program is taking place in an academic institution, the group setting provides an important opportunity for student clinicians to observe a broad range

of professional behaviours displayed by clinicians and to measure and observe the variable progress in different clients within this setting. Group therapeutic programs also provide an ideal way for the individuals who stutter to gradually phase out of the more intensive individual treatment schedules and plan for the generalisation of their skills over time (Levy, 1983).

Based on the various benefits of group therapy programs for people who stutter detailed above, the Fluency & Confidence and concurrently run Investing in Parents group programs were developed with these benefits in mind. One of the components of group therapy that was deemed essential in the Fluency & Confidence program was the modelling benefits. As certain members of the group were able to make positive changes to their speech, other group members increased their belief that they were also capable of such success. The clients who became more assertive gained momentum from others in the group.

Luterman (1991) highlighted the importance of another fundamental principle of the Fluency & Confidence program called the promotion of universality. When the members of the group shared a common difficulty, other members of the group recognise that they were not alone. The group therapeutic setting provided a means for coping with potential feelings of isolation and loneliness.

The Fluency & Confidence group setting provided the clients with the opportunities to practice recently learned stuttering modification techniques in a realistic setting. For most speakers, publicly speaking in a supportive group environment is a practical initial step in generalizing newly acquired behavioural techniques. Successfully using and applying the techniques in a group setting helped to reduce the client's potential dependence on the clinician. The inclusion of other clinicians and parents provided the opportunity for individuals who stuttered to understand, many for

the first time, that non-stuttering speakers share many of the same fears about speaking in public or about risk-taking in general.

In addition, the Fluency & Confidence and Investing in Parents group treatment program evolved through the stages of ‘forming’, ‘storming’, ‘norming’, and ‘performing’ (Tuckman, 1965). The child and parent group members learned to adjust to the group protocol, and discovered how to identify roles and resolve conflicts. Members became committed to working with each other, and focused on integrating the group with family objectives and goals.

In summary, the potency of group therapeutic dynamics provided the opportunity for child and parent group members to deal with questions concerning wide-ranging psychosocial issues. These were associated with the challenges of daily living, feelings of loneliness, dependency, and future fears. The guided group discussions reduced anxiety, demystified the fears and allowed the child and adult members to improve the quality of their decision making which impacted positively on many interpersonal aspects of their lives.

### **2.1.3 Fluency & Confidence and Investing in Parents Group Program**

The clinical content of the unique concurrently run Fluency & Confidence (F & C) and Investing in Parents (IIP) group programs for young people who stutter and their parents are summarised in Table 2.1.

The program evolved from clinical initiatives adapted in the Curtin University Stuttering Treatment Clinic (CUSTC). The holistic treatment philosophy of the primary clinical educator, Janet Beilby, was mapped onto the biopsychosocial model of Yaruss and Quesal (2004). This concurrently run group program adopts a holistic biopsychosocial approach integrating Speech Pathology and Clinical Psychology practices. The program planned to meet the needs of children and adolescents for

whom early speech pathology intervention was deemed unsuccessful. The group program targeted 8 – 17 year old children and adolescents who stuttered with the aim of empowering them through the integration of Fluency Techniques and Confidence Skills and empowering their parents through education and modelling.

Table 2.1: Concurrent Fluency & Confidence & Investing In Parents Group Programs

Week	Session Topic	Content Outline
1	<b>Introduction</b>	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Introductions</li> <li>• Explanations of theories of stuttering</li> <li>• Definitions and descriptions of stuttered behaviours</li> <li>• Psycho-education – Program Rationale</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – “Getting to know you”</li> <li>• Introducing different Fluency Techniques in Group Setting</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion – “Telling your story”</li> <li>• Overview of Parenting Styles</li> <li>• Overview of Stuttering Therapy</li> <li>• Overview of Parent’s Participation in Program</li> </ul>
2	<b>Foundation Skills</b>  “Feelings & Thoughts” “Decision Making Skills”	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Psycho-education – Feelings &amp; Thoughts</li> <li>• “It’s OK to talk about feelings with others that I trust”</li> <li>• “Having a thought versus Buying a thought”</li> <li>• Psycho-education – Decision Making Skills</li> <li>• 3 Step Decision Making Method</li> <li>• “Detect, Investigate &amp; Decide (DID)”</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities – Feelings &amp; Thoughts</li> <li>• Group Activities – Decision Making and Problem Solving Skills</li> <li>• Group Activities which Incorporate Fluency Techniques with Foundation Skills</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy</li> <li>• Group Discussion – Feelings &amp; Thoughts</li> <li>• Group Discussion – Decision Making Skills</li> <li>• Review of Child &amp; Adolescent’s Progress</li> </ul>
3	<b>Communication Skills</b>	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Psycho-education – Communication Skills</li> <li>• “Communication is Not All Talk”</li> <li>• Body language, verbal language and active listening</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities – Communication Skills</li> <li>• Group Activities which Incorporate Fluency techniques with Communication skills</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy Progress</li> <li>• Group Discussion – Communication Skills</li> <li>• Review of Child &amp; Adolescent’s Progress</li> </ul>

Week	Session Topic	Content Outline
4	Assertiveness Skills	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Psycho-education – Assertiveness Skills (vs Passive &amp; Aggressive)</li> <li>• “I can express my feelings and stand up for myself”</li> <li>• “Say it Straight”</li> <li>• Assertive, passive and aggressive communication styles</li> <li>• “Describe the <i>situation</i>, say how you <i>feel</i>, say what you <i>want</i>”</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities – Assertiveness Skills (vs Passive and Aggressive)</li> <li>• Group Activities which incorporate Fluency techniques with Assertiveness skills</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy Progress</li> <li>• Group Discussion – Assertiveness Skills (vs Passive and Aggressive)</li> <li>• Review of Child &amp; Adolescent’s Progress</li> </ul>
5	Negotiation Skills	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Psycho-education – Negotiation Skills</li> <li>• “When you disagree, listen to the other person and negotiate ”</li> <li>• “<i>You</i> say what you want, <i>listen</i> to what the other person wants, make a fair <i>deal</i>”</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities – Negotiation Skills</li> <li>• Group Activities which incorporate Fluency techniques with Negotiation skills</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy Progress</li> <li>• Group Discussion – Negotiation Skills</li> <li>• Review of Child &amp; Adolescent’s Progress</li> </ul>
6	Coping Skills	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Psycho-education – Coping Skills</li> <li>• “Our bodies know what is good for them”</li> <li>• “Listen to our bodies and use your coping skills”</li> <li>• Early signs, coping skills, relaxation techniques</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities – Coping Skills</li> <li>• Group Activities which incorporate Fluency techniques with Coping skills</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy Progress</li> <li>• Group Discussion – Coping Skills</li> <li>• Review of Child &amp; Adolescent’s Progress</li> </ul>
7	Network Skills: Family and Friends	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Psycho-education – Networks: Family and Friends</li> <li>• “Nothing is so awful...or so little...that we can’t talk about it with someone”</li> <li>• “Family and friends are important network members”</li> <li>• Networks, Friendship-Making Skills, Managing Difficult situations</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities – Network Skills</li> <li>• Group Activities which incorporate Fluency techniques with Network skills</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy Progress</li> <li>• Group Discussion – Network Skills</li> <li>• Review of Child &amp; Adolescent’s Progress</li> </ul>



Week	Session Topic	Content Outline
8	Transition & Review	<p><i>Children, Adolescents and Parents Together:</i></p> <ul style="list-style-type: none"> <li>• Overview and Review of F &amp; C and IIP Group Program</li> <li>• Transition and Maintenance</li> <li>• “I can cope with changes in my life”</li> </ul> <p><i>Children &amp; Adolescents:</i></p> <ul style="list-style-type: none"> <li>• Group Activities – Fluency Technique Review and Practice</li> <li>• Group Activities which incorporate Fluency techniques with Confidence skills</li> <li>• Relapse Prevention Activities</li> </ul> <p><i>Parents:</i></p> <ul style="list-style-type: none"> <li>• Group Discussion - Review of Stuttering Therapy Progress</li> <li>• Group Discussion – Transition and Maintenance</li> <li>• Review of Child &amp; Adolescent’s Progress</li> <li>• Presentations of Certificates and Celebration Party</li> </ul>

The results pertaining to the treatment program for the Fluency & Confidence participants were collected in naturalistic within and beyond clinical settings, and therefore reflect treatment *effectiveness*, rather than treatment *efficacy*. The overarching clinical intention of this group program was to conduct an *effectiveness* treatment initiative with sound professional integrity. Therefore the goals of the data analyses were to highlight the evidence base to such ethical initiatives.

## 2.2 Efficacy and Effectiveness Treatment Practices

While stuttering treatment has some support in efficacy based studies (see Chapter 1), there has been debate in the literature as to the difference between what constitutes efficacious versus effective treatment practices (for reviews see Bernstein Ratner, 2005; Manning, 2010, p. 305 – 313). Efficacy studies characteristically have high internal validity (Westen, Novotny & Thompson-Brenner, 2004) due to their use of randomised controlled trials; controlling for as many variables as possible; constraining and standardising therapists by using treatment manuals; and commonly having strict exclusion criteria (Seligman, 1995; Westen & Bradley, 2005; Westen et al., 2004). While these efficacy studies have excellent internal validity, they have often been criticised for a number of reasons, particularly their lack of ecological validity and generality.

Westen and colleagues (2004; 2005) recognise the value of randomised controlled trials (RCTs), however in doing so raised a number of important limitations. Firstly, the outcomes of RCTs cannot be assumed to generalise to non-research settings, with only a small percentage of therapists in the field achieving similar results to those reported in efficacy studies. RCTs place a high value on strong internal validity, but do so at the expense of external validity, which may result in making them excellent robust studies, but again which may not generalise to everyday practice. For example, exclusion criteria such as excluding participants with co-occurring conditions may make for a purer sample; however clinicians are faced with clients of complex presentations and multiple co-occurring conditions, and are left to question how applicable RCTs are to their own client groups (Westen & Bradley, 2005; Westen et al., 2004).

Secondly, Westen and colleagues (2004; 2005) posit that control condition in most RCTs are designed to be inactive, and offer little in the way of credibility, hope and other factors which are important in producing therapeutic gains. Therefore, comparing such a condition against an active treatment which has the support of the therapist involved provides additional advantage to the active condition.

Effectiveness studies, on the other hand, aim for high external validity, and test whether a therapy performs well in naturalistic settings (Seligman, 1995). By the very nature of these studies, variables are less able to be controlled for, but the results of such studies make them especially useful for practicing clinicians. Seligman goes as far as to state that “the efficacy study is the wrong method for empirically validating therapy as it is actually done, because it omits too many crucial elements of what is done in the field” (Seligman, 1995, p. 966).

### **2.2.1 Evidence-Based Practice vs Practice-Based Evidence**

It has been proposed by selected clinicians and researchers that the gold-standard method of treatment efficacy research is the randomised controlled trial (Piantadosi, 1997). However, in order to demonstrate the often subtle cause-and-effect relationships of therapy programs, considerable rigor and control is exercised by clinical researchers regarding participant selection with the ultimate goal of maximizing the homogeneity of those participating. Individuals with co-occurring conditions are typically excluded based on the proposal that they may contaminate and make the results difficult to interpret unequivocally. In addition, specific manualised protocols are published and treatment techniques prescribed in RCTs in order to ensure replicability with the focus on maintaining control of possible contaminating variables. In RCTs, participants are randomly assigned to the groups and the results of rigorous testing during these well-controlled conditions are designed to lead to outcomes demonstrating *efficacy* of treatment protocols. However, there are often discrepancies between the theoretical models proposed and their prescribed treatment protocols and techniques for practicing clinicians working with the clients on a daily basis (Manning, 2010).

Practicing clinicians indisputably wish to demonstrate that the therapy they are implementing on a daily basis to assist their clients is likely to be helpful and result in successful therapeutic outcomes. However, clinicians who make decisions and implement true effectiveness based therapy, treat their clients under circumstances and environments that are far less rigorous and less well-controlled than those created in research clinical trials. Professional clinicians are treating individuals with stuttering difficulties who have not been randomly assigned to a variety of treatment programs and clinicians are likely to be treating people who are highly heterogeneous and present with a variety of other, sometimes related, communication problems. In the practical therapeutic environment, there are inevitably uncontrolled and often unknown

environmental factors that may impact on the treatment techniques being selected and ultimately implemented. The results of these natural clinical choices demonstrate *effectiveness* of treatment programs with high integrity (Manning, 2010).

The majority of evidenced-based clinical practice in the research literature is based on the medical model, which proposes that there are specific components which account for and are necessary for the remediation of a medical disorder. Within the medical model it follows that due to the specificity of the components administered to the experimental groups of participants, clinical researchers should follow procedural manualised program instructions in order to ensure adherence to the treatment protocol per se. Although it is noted that historically within the medical field this model has resulted in important advances in the development of medications and medical procedures, there have been recent challenges posed by the research literature. Such challenges reason that this model may not be the best nor the most appropriate for investigating complex, subtle and multifaceted therapeutic changes that take place within the treatment of a complex human disorder (Manning, 2010). The medical model does not necessarily elucidate the generalisation of therapeutic outcomes that occur beyond the scope of the formal treatment practice (Monk, Winslade, Crocket, & Epston, 1997; Raskin & Lewandowski, 2000).

The medical model of disability places emphasis on a disease-entity approach which infers that experts are required to cure the disease. Within this doctrine is the tendency to label and pathologise individuals seeking assistance while placing them in a passive role (Monk et al., 1997). Other clinical researchers have critiqued the medical model of mental health, along with the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) of the American Psychiatric Association (APA) (American Psychiatric Association, 2000) for the promotion and use of terms or phrases which are counter-productive and inaccurate for the therapeutic environment (e.g., disorder,

pathology, symptoms, patient, recovery, cure) (Monk, et al., 1997; Raskin & Lewandowski, 2000).

In contrast to the medical model, Wampold and his research colleagues (Ahn & Wampold, 2001; Wampold et al., 1997; Wampold & Brown, 2005) developed a “common factors model” which embraced and accounted for treatment outcomes across many treatment approaches. Wampold and colleagues (2004; 2005) identified several factors that were common across a variety of treatment approaches and were representative in accounting for the variance in treatment outcome. Among the common factors that were found to contribute to a successful therapeutic outcome were: the nature of the working alliance of the client and the clinician which accounted for 5%; clinician allegiance (adherence) to the treatment protocol which accounted for 10%; and the quality of the clinician which accounted for 22%. Wampold and colleagues have consistently demonstrated how the quality and effectiveness of the clinician has been found to account for the greatest outcome variance (Ahn & Wampold, 2001; Kim, Wampold, & Bolt, 2006; Wampold, 2001; Wampold et al., 1997). In fact, Ahn & Wampold (2001) have suggested that people who stutter should search for particular experienced and effective clinicians rather than particular treatments.

Herder, Howard, Nye, and Vanryckeghem (2006) have reported similar results in a meta-analysis of behavioural treatments for stuttering. Independent of the work of Wampold and his colleagues (2004; 2005), Herder et al. (2006) concluded that “the critical elements for successful intervention might not lie with the intervention itself” (p. 70) but in the common elements found across many treatment approaches. Like Wampold and colleagues, these authors further suggest that the knowledge and skills of the clinician who is providing the treatment is probably a defining and critical element influencing success of treatment.

Recent evidence is emerging in the field of stuttering research regarding the usefulness of the common factors model to inform the effectiveness of treatment choice for stuttering. Craig et al. (1996) have reported consistent results for three treatment protocols (intensive smooth speech, parent-home smooth speech, and intensive electromyography feedback) during the treatment programs and up to one year post-group. Following this initial treatment effectiveness study, Hancock et al. (1998) conducted a two-to-six year follow-up of the 62 children who had received one of the three stuttering treatments. Using a variety of outcome indicators of such as stuttering behaviour, speech naturalness, communication attitudes, and anxiety, the authors found no differences in long-term effectiveness between or across the three treatment programs.

In addition, Franken, Van der Schalk and Boelens (2005) have compared the Lidcombe program with a Demands and Capacities protocol. Consistent with the common factors model, the frequency and severity ratings of stuttering decreased significantly and were similar for the children in both programs regardless of the treatment prescribed. Therefore based on the available research to date, it is likely that, regardless of the particular treatment approach, factors such as the working alliance between the client and the clinician and clinician allegiance to the treatment protocol are essential. As the common factors model proposes, clinicians need to have allegiance to the program they are implementing, and an inherent belief that the treatment program will be effective. In addition, the underlying treatment philosophy should be congruent with the clinician's view of therapeutic change.

Bernstein Ratner (2005) has discussed in detail the limitations of RCTs for the allied health professions. Bernstein Ratner (2005) believes that the control groups created during RCTs pose particular problems given the ethical issues of withholding treatment from individuals who would likely benefit from assistance. In addition, there

are inevitably problems in trying to eradicate the confounding effects of prior learning from previous treatments. The naive RCT medical model of withdrawing treatment from individuals who have experienced the treatment is unlikely to eradicate prior learning and cognitive changes that have already occurred. Conversely, the positive placebo effects experienced by individuals who are selected for the control group component may result in improvements, moderating the true effects of the standard treatment component. In addition, there is the clear possibility for evidence based practice research to provide compelling but superficial evidence for a selected brand of treatment program. It is also possible that an overemphasis on evidence based practice may result in the endorsement of questionable treatment programs that are not based conceptually or empirically on sound principles of change. This latter circumstance is more likely to occur with treatment programs, in which a cohort of individuals is involved in the training and franchising of the treatment program (Bernstein Ratner, 2005).

Bernstein Ratner (2005) makes the point that some treatments may also be unacceptable to people for a variety of individual reasons. Researchers who are conducting efficacy based studies exclude participants who are in some way noncompliant with the treatment protocol (Hollis & Campbell, 1999). This practice of excluding noncompliant individuals risks biasing the treatment outcome results selectively in favour of the treatment group.

Kerridge, Lowe & Henry (1998) stated that the concept “currently without substantial evidence” should not be confused with the perception “without substantial value.” Other clinical researchers (Westen & Morrison, 2001) have also argued that “to infer that one treatment is more efficacious than another because one has been subjected to empirical scrutiny using a particular set of procedures and the other . . . has not, is a logical error” (p. 878). These clinical researchers are consistent in their belief that

caution should be exercised when distinguishing empirically unvalidated from empirically invalidated treatments programs. Furthermore, esteemed authors (Bernstein Ratner, 2005; Westen & Morrison, 2001; Siegel, 1993; Zebrowski, 2007) have stated that clinical researchers need to not only demonstrate a treatment to be effective but also to explain the underlying principles of why the treatment program is effective. It is only through the process of understanding what principles and relationships might be operating that clinicians can adjust the treatment protocol to the unique characteristics and needs of the client.

The goal of this overview of effectiveness and efficacy based research practices was to highlight alternative interpretations of these important research concepts. The culmination of such an overview while presenting the important contributions of the medical model, demonstrates how alternative models of therapeutic and extra-therapeutic change need to be considered. The common factors model and effectiveness based research practices emerge as clinically valid ways of measuring therapeutic change.

### **2.3 Chapter Summary**

It is clear that in the treatment of the stuttering disorder, the fundamental treatment decisions are driven by the surface typography of stuttered speech behaviours and the underlying affective and cognitive components of stuttering as manifested in a particular individual. The clinical challenges that a clinician is then faced with is how best to assist the child or adolescent who stutters to achieve the goals of enhanced fluency, improved communication abilities and improved coping strategies. It has been proposed that in contrast to the young child who stutters, the school-age child or adolescent client typically enters treatment with well-developed and sometimes covert sets of coping responses which have been developed over time to assist them to negotiate with a generally fluent culture. Over time the older child and adolescent who



stutters has learned to survive with their stuttering problems and because the coping responses are often developed long-term, firmly established and tightly bound together with anxiety and fear, treatment for these age groups is typically more complex necessitating more effort and time. Through therapeutic alliances, the clinician and child or adolescent can begin the process of identifying and challenging the affective, behavioural and cognitive patterns that have for so long informed the person's choices about communicating with others.

It has been proposed in this Chapter 2, that parental involvement in the treatment program and group programs often provide the scaffolding for behavioural changes and are an essential part of treatment programs, providing information, support, and insight that may otherwise be unavailable. The activities of the group provide members with an opportunity to practice skills learned during individual meetings, experiment with new speaking roles, and test new perceptions with others who share the same difficulties. The group experience reinforces the ideas that the speaker is not alone and that they do have positive choices about communicating and how they choose to live their lives.

### **3.0 CHAPTER 3: WAITLIST FOR F & C GROUP PROGRAM**

Chapter 1 highlighted the need for a broader conceptualisation of stuttering to illuminate the impact of the stuttering disorder on anxiety and inherent psychosocial variables. The conclusion was drawn that a better understanding is needed regarding the relationship between the stuttering disorder and anxiety in children and adolescents who stutter. In addition, the impact of the stuttering disorder on various psychosocial variables (behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering, communication difficulties in daily situations, and quality of life) was also expounded. Through review of the literature, this biopsychosocial therapeutic framework of evaluating stuttering and its impact in children and adolescents who stutter evolves as an issue that has not been addressed in detail by previous research and provides one of the central tenets of this thesis. The biopsychosocial theoretical support for the links between anxiety, psychosocial variables and stuttering severity was then detailed in the context of some more recent treatment programs.

In Chapter 2 an overview of the unique holistic biopsychosocial concurrently run Fluency & Confidence and Investing in Parents group treatment program was presented. The development and implementation of this group program was based on the biopsychosocial model of Yaruss and Quesal (2004) and the clinical expertise and practice of the Curtin University Stuttering Treatment Clinic. The importance of parental involvement and group dynamics was highlighted. In addition, the distinction was drawn between efficacy and effectiveness based treatment research in the context of a clinical setting. The purpose of this comparison between efficacy and effectiveness based treatment practices was to reinforce the use of effectiveness base research methods in this particular thesis framework.

Chapter 3 constitutes the first in a series of three studies designed to explore the relationship between anxiety, psychosocial variables and stuttering severity.

### **3.1 STUDY AIM AND HYPOTHESES**

This study addressed four areas of investigation: i) The difference between children who stutter (CWS) and adolescents who stutter (AWS) for whom early speech pathology treatment was deemed unsuccessful, compared to their fluent peers on a range of psychosocial variables (state anxiety, trait anxiety, social anxiety, behavioural and social difficulties, self-awareness of stuttering/speaking ability, reactions to stuttering/speaking ability, communication difficulties in daily situations, and quality of life); ii) The relationship between these psychosocial variables and stuttering severity in CWS and AWS; iii) Whether any significant differences exist between CWS and AWS when measuring the relationships between these psychosocial variables and stuttering severity; and finally, iv) The factor structures of the various psychosocial variables measured.

Firstly, the possibility of a significant difference between CWS and AWS compared to their fluent peers on a range of psychosocial variables was explored. Variables based on the biopsychosocial model (Yaruss & Quesal, 2004) as a framework include: state anxiety, trait anxiety, social anxiety, behavioural and social difficulties, self-awareness of stuttering/speaking ability, reactions to stuttering/speaking ability, communication difficulties in daily situations, and quality of life. Given the background detailed in Chapter 1, it was posited that CWS and AWS compared to their fluent peers would demonstrate more dysfunctional levels of anxiety, social anxiety, behavioural and social difficulties, self-awareness of speaking ability, reactions to speaking abilities, communication difficulties in daily situations and quality of life.

Secondly, this study explored the relationship between these psychosocial variables and stuttering severity for CWS and AWS using the biopsychosocial model (Yaruss & Quesal, 2004) as a framework. Further exploration addressed which psychosocial variables, if any, were predictors of stuttered speech severity in these populations. Based on the limited previous research, it was hypothesised that CWS and

AWS would demonstrate statistically significant associations between some of these psychosocial variables and their stuttered speech severity.

Thirdly, this study explored the developmental differences between CWS and AWS when investigating the relationships between psychosocial variables and stuttering severity. The hypothesis was that given the impact and distress of experiencing stuttering for a longer period of time, the AWS would demonstrate greater statistically significant associations between some of these psychosocial variables and their stuttered speech severity.

Finally, Chapter 3 aimed to explore the factor or component structure of the various psychosocial variables measured using the biopsychosocial model (Yaruss & Quesal, 2004) as a framework. Based on the research and theory proposed by Yaruss and Quesal (2004; 2006), it was posited that using the data obtained from the CWS and AWS in this study, a definite factor structure would support the proposed Yaruss and Quesal (2004) model.

## **3.2 METHOD**

### **3.2.1 Participants**

#### **3.2.1.1 Children who Stutter (CWS) and Adolescents who Stutter (AWS)**

Participants were 39 children (8-11 years) and 36 adolescents (12-17 years) who were referred to the Curtin University Stuttering Treatment Clinic (CUSTC) for admission to the holistic biopsychosocial Fluency & Confidence (F & C) Group Program. All of the children and adolescents were placed on the Wait-List and assessed 8 weeks prior to the commencement of the F & C Group Program (Perth, Western Australia). All attended primary or secondary suburban and rural schools in Western Australia. Seven of the 75 participants who stuttered lived in a rural area (ranging from 200 kilometres south-west of Perth to 1600 kilometres north-east of Perth). All other participants resided in the Perth metropolitan region. The participants consisted of 64

males and 11 females. Parents and caregivers of participants who stuttered reported onset in early childhood in a manner consistent with developmental stuttering and all participants who stuttered had previously attended speech pathology treatment for their stuttering difficulties. Sixty four (85%) of the children and adolescents who stuttered had enrolled in speech pathology treatment in the past year however, no child was receiving active speech pathology intervention at the time of this study. None of the participants reported a history of pharmacological intervention for anxiety-related disorders. Table 3.1 and 3.2 provides relevant case history details on the CWS and AWS as reported by their parents and caregivers.

Table 3.1: Demographic Details of Child Participants Who Stutter

Participants	Gender	Age	%SS	Reported	Predominant
		(Years)		Stutter Onset	Stuttered Behaviour
C01	Male	9	3.1	3 years	Prolongations
C02	Male	9	2.7	3-4 years	Prolongations
C03	Male	11	2.8	4 years	Prolongations
C04	Male	10	3.3	3 years	Repetitions
C05	Male	9	2.9	3-4 years	Repetitions
C06	Male	8	3.5	3 years	Repetitions/Prolongations
C07	Male	10	5.3	2.5 years	Blocks
C08	Male	8	5.0	3 years	Blocks
C09	Male	10	2.8	3-4 years	Repetitions
C10	Female	10	3.6	4 years	Repetitions
C11	Male	11	11.0	3-4 years	Blocks
C12	Female	10	3.6	3 years	Blocks
C13	Female	10	2.5	3 years	Prolongations
C14	Male	8	3.9	3-4 years	Prolongations
C15	Male	9	9.5	3 years	Prolongations
C16	Male	9	5.5	3 years	Blocks
C17	Male	11	3.2	3 years	Repetitions
C18	Male	11	2.5	4 years	Repetitions
C19	Male	11	2.9	3-4 years	Blocks
C20	Male	10	4.8	2 years	Blocks
C21	Male	9	9.5	3 years	Blocks
C22	Male	10	2.8	3.5 years	Prolongations
C23	Male	9	3.8	3 years	Blocks
C24	Male	10	5.9	3 years	Prolongations
C25	Male	10	3.1	3 years	Blocks
C26	Male	8	3.5	4 years	Repetitions/Prolongations
C27	Male	9	5.8	3 years	Blocks
C28	Male	10	3.4	3 years	Prolongations
C29	Male	9	2.4	3 years	Repetitions
C30	Male	11	4.0	4-5 years	Blocks/Prolongations
C31	Male	11	9.5	4-5 years	Blocks/Prolongations
C32	Male	10	4.0	3 years	Blocks/Prolongations
C33	Male	11	2.5	3.5 years	Prolongations
C34	Female	8	3.2	3.5 years	Prolongations
C35	Male	8	6.5	3 years	Repetitions
C36	Female	9	10.0	4 years	Repetitions
C37	Male	11	3.5	3 years	Blocks
C38	Male	8	10.0	3-4 years	Repetitions
C39	Male	11	4.1	3 years	Repetitions

Table 3.2: Demographic Details of Adolescent Participants Who Stutter

Participants	Gender	Age	%SS	Reported	Predominant
		(Years)		Stutter Onset	Stuttered Behaviour
A01	Male	12	7.8	3-4 years	Prolongations
A02	Male	12	4.6	4 years	Prolongations
A03	Female	13	3.4	3-4 years	Repetitions
A04	Female	13	3.1	3-4 years	Repetitions
A05	Female	12	3.5	3 years	Prolongations
A06	Male	12	3.4	3 years	Repetitions
A07	Male	12	4.5	3 years	Blocks
A08	Male	12	2.2	3.5 years	Blocks
A09	Male	12	7.5	3 years	Prolongations
A10	Male	12	4.3	4 years	Prolongations
A11	Male	12	4.1	4 years	Prolongations/Blocks
A12	Male	13	4.6	3.5 years	Prolongations
A13	Male	14	5.5	3 years	Prolongations
A14	Male	12	8.5	3 years	Blocks/Prolongations
A15	Male	14	4.5	4 years	Prolongations/Blocks
A16	Male	13	18.5	2.5 years	Blocks/Prolongations
A17	Male	13	12.5	4 years	Blocks
A18	Male	13	3.1	2.5 years	Prolongations
A19	Male	12	2.4	3 years	Repetitions
A20	Male	12	4.5	3-4 years	Prolongations
A21	Male	12	5.3	3 years	Blocks
A22	Male	16	13.8	3-4 years	Blocks
A23	Female	15	2.8	3 years	Blocks
A24	Female	15	4.8	3-4 years	Prolongations
A25	Male	16	7.3	4 years	Blocks
A26	Male	14	2.8	3 years	Prolongations
A27	Male	16	6.1	4 years	Blocks/Prolongations
A28	Female	15	5.2	3 years	Blocks
A29	Male	16	8.7	3 years	Blocks/Prolongations
A30	Male	16	5.1	3-4 years	Blocks
A31	Male	14	3.4	3-4 years	Prolongations
A32	Male	15	6.4	3-4 years	Blocks
A33	Male	15	2.0	3 years	Repetitions
A34	Male	14	2.1	3 years	Prolongations
A35	Male	17	10.0	3 years	Blocks
A36	Male	17	16.1	3 years	Blocks

### 3.2.1.2 Participants who do not Stutter

Seventy-five control participants were age and sex matched as a cohort to the stuttering group with 39 control children (8 -11 years) and 36 control adolescents (12-17 years).

### 3.2.2 Measures

#### *Stuttered Speech Severity*

Speech stuttering severity in the group of children and adolescents who stuttered was determined by rating a representative natural conversational speech sample for each of the 75 participants. A minimum of 2000 syllables of speech were obtained and rated by two speech pathologists at the CUSTC (Perth, Western Australia). The computer program Stuttering Measurement System (Ingham et al., 2005) was used to obtain the percentage of syllables stuttered (%SS). This program uses mouse-clicks to count syllables and stuttering events whilst the audio recording is played. A higher %SS indicates more severe stuttering behaviour. Inter-rater reliability was examined by dividing a randomly selected 2000 syllable sample into 30 second time frames and then comparing the number of stutters identified across the time frames for two independent raters. An intra-class correlation coefficient of .91 was obtained using a one-way independent group random effect model of analyses (as described by Howell, 2007) which shows judgements were both satisfactorily correlated and in agreement. Intra-rater reliability was calculated using the same method and an intra-class correlation coefficient of .89 was obtained, demonstrating satisfactory correlation and agreement within rater's judgements.

#### *Typography*

The types of stuttering behaviours (repetitions, prolongations and blocks) were analysed from each speech sample with the support of a visual display of the acoustic speech signal using the program Praat (Boersma & Weenink, 2007). The listener judged the category of stutter as a repetition, a prolongation or a block, and then used graphical representation of the acoustic signal (a speech waveform and a spectrogram) to confirm this decision using guidelines described by Czyzewski, Kaczmarek, and Kostek (2003).



Inter-rater reliability was evaluated by calculating the percent agreement of typography category across all samples for two independent raters. Raters agreed on typography category for 91% of stutters. Intra-rater reliability was obtained using the same method and calculated to achieve 93% in agreement.

#### *State and Trait Anxiety (STAIC & STAI)*

Each child (8 -11 years) participant completed the State Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973). This questionnaire measures state and trait anxiety in a self-report format and comprises 20 statements for each state and trait section. The children were instructed to read each statement and indicate their response on a scale of 1 to 3. The state measure was completed before the trait, with standard instructions provided by Spielberger (1973). The STAIC took approximately 10 minutes to complete.

The reliability and validity of the STAIC is well supported in the literature, with alpha reliability coefficients for 9 – 12 years old children respondents reported as .82 for males and .87 for females (state scale) and .78 for males and .81 for females (trait scale) (Spielberger, 1973). The correlations reported for 9 – 12 year old children between the trait anxiety scale and other similar measures range from .63 to .75, demonstrating satisfactory validity (Speilberger, 1973).

Each adolescent (12 – 17 years) participant completed the State Trait Anxiety Inventory (STAI; Spielberger, 1983). This questionnaire measures state and trait anxiety in a self-report format and comprises 20 statements for each state and trait section. Participants were instructed to read each statement and indicate their response on a scale of 1 to 4. The state measure was completed before the trait, with standard instructions provided by Spielberger (1983). The STAI took approximately 10 minutes to complete.

The reliability and validity of the STAI is well supported in the literature, with alpha reliability coefficients for high school aged respondents reported as .86 (for the state scale) and .90 (for the trait scale) (Spielberger, 1983). The correlations reported for high school aged students between the trait anxiety scale and other similar measures range from .52 to .85 and the correlations between state and trait anxiety scores range from .64 to .72, demonstrating satisfactory validity (Spielberger, 1983).

#### *Brief Fear of Negative Evaluation Scale Revised (BFNE-II)*

All children and adolescent participants completed the Brief Fear of Negative Evaluation Scale Revised (BFNE-II; Carleton, McCreary, Norton & Asmundson, 2006). The BFNE-II is a modified version of the BFNE (Leary, 1983) which is a shortened version of the FNE (Watson & Friend, 1969). The difference between the BFNE and the BFNE-II that was used in this study was that the reverse-worded items were reworded to be more comprehensible. This scale comprises 12 clearly worded statements that address the apprehension about evaluation by others, the expectations that such evaluations would be negative and the distress incurred (Carleton et al., 2006). Participants were instructed to read each statement and rate the degree to which each of the 12 statements applies to them on a 5-point Likert scale (1 = not at all characteristic of me; 5 = extremely characteristic of me). The total scoring ranges from 12 to 60. The BFNE-II took approximately 10 minutes to complete. It is reported that the scale correlates significantly with other tests of anxiety (with Pearson product moment correlation coefficients ranging from .18 to .60) and has strong reliability (the KR-20 reliability statistic was reported as .94) (Carleton, Collimore & Asmundson, 2007). The reliability and validity of this scale has been replicated by other researchers (Carleton et al., 2007).

### *Strengths and Difficulties Questionnaire (SDQ)*

Each child and adolescent was required to complete a Strengths and Difficulties Questionnaire (SDQ; Goodman & Scott, 1999). The SDQ is a 25 item questionnaire designed to obtain a screening assessment of a child's (aged from 4 to 17 years) internalising and externalising behaviours as well as their social adjustment. The SDQ has been found to reliably identify high from low risk children within the community (Goodman & Scott, 1999). Six versions currently exist for parents, teachers and children to report on a child's behaviour, with only parents completing the SDQ on children aged 4 to 10 years of age. However, recent studies have confirmed children as young as 7 years can successfully and reliably complete the SDQ Parent or Teacher<sup>4-10</sup> version to rate themselves (Mellor, 2004). In this study, different versions of the SDQ were used matched to the child's age. Children 10 years and below completed the baseline Parent or Teacher<sup>4-10</sup> version, while children aged 11 years and above completed the baseline Self<sup>11-17</sup> version. The cut off scores from which children are distinguished between normal, borderline and abnormal adjustment, vary across the parent (SDQ-Parent) and self-reported (SDQ-Self) versions. For instance, the upper limit of the normal range for the total difficulties score on the SDQ-Self is 15 and 13 on the SDQ-Parent version (Mellor, 2004). A higher total difficulties score reflects greater difficulties with adjustment.

The test-retest reliability and long term stability of the different versions of the SDQ is well documented in the literature. The test-retest reliability coefficients (measuring total difficulties) of the parent version have been reported as .81 and the youth version, as .79. The long term stability of the parent and youth versions have been reported as .72 and .62 respectively (Achenbach et al., 2008). Participants were instructed to read each statement and indicate their response on a scale of Not True,

Somewhat True or Certainly True. The SDQ took approximately 10 minutes to complete.

#### *Overall Assessment of the Speaker's Experience of Stuttering (Child & Adolescent)*

The Overall Assessment of the Speaker's Experience of Stuttering questionnaire (Child & Adolescent version) (OASES-C & A; Appendix A; Yaruss & Quesal, 2006; 2008) consists of 100 items, each scored on a Likert scale ranging from 1 to 5. The questionnaire is divided into 4 sections (Section I: General information about Stuttering; Section II: Affective, Behavioural and Cognitive Reactions, Section III: Communication in Daily Situations, and Section IV: Impact of Stuttering on Quality of Life). Section I (General Information) contains 20 items pertaining to the speakers' perceived fluency and speech naturalness, knowledge about stuttering and stuttering therapy, and overall perceptions about stuttering in general. Section II (Reactions) contains 30 items examining the speakers' affective, behavioural, and cognitive reactions. Section III (Communication in Daily Situations) contains 25 items assessing the degree of difficulty speakers have when communicating in general situations, at work, in social situations, and at home. Note that these items specifically examine the communication *difficulty* experienced by speakers in these situations, not their *fluency* in the situations. Section IV (Quality of Life) contains 25 items assessing how much stuttering interferes with the speakers' satisfaction with their ability to communicate, their interpersonal relationships, their ability to participate actively in life, and their overall sense of well-being. The OASES took approximately 20 minutes to complete.

The child and adolescent questionnaire (OASES-C & A; Appendix A) differs from the adult version (Yaruss & Quesal, 2008) in terms of simpler wording on certain items. The adult version has demonstrated strong reliability and validity, with Pearson product moment correlation coefficients for impact scores reported to range from .90 to

.97 (Yaruss & Quesal, 2006). Concurrent validity correlation coefficients are reported to range from .68 to .83 (Yaruss & Quesal, 2006). No reliability or validity data are currently available for the child and adolescent version.

An adapted questionnaire scale (OASES-N; Appendix B) has been used successfully to compare results from fluent speakers, with the word *stuttering* being replaced with *speaking ability* (Mulcahy et al., 2008). This questionnaire version (OASES-N) was presented to the fluent control group whilst the original questionnaire (OASES-C & A) was presented to participants with stuttering difficulties. Raw scores were converted to impact scores using the procedure outlined by Yaruss and Quesal (2006) and these impact scores were used in data analyses to account for participants who may not have responded to all questions.

For each item on the OASES, response scales are organised so that higher scores indicate a greater degree of negative impact associated with stuttering and lower scores indicate less negative impact.

#### *Stages of Change Questionnaire (Modified)*

Each adolescent (12 – 17 years) who stuttered completed the Stages of Change questionnaire (SOC; Appendix C; Floyd, Zebrowski, & Flamme, 2007). This questionnaire comprised 32 statements consisting of four, 8-item subscales to measure the four distinct stages of change: precontemplation, contemplation, action and maintenance. Participants were instructed to respond to each item using a 5-point Likert format, where 1 corresponded to “strongly agree” and 5 corresponded to “strongly disagree”. The SOC took approximately 10 minutes to complete.

Floyd et al. (2007) analysed the extent to which the responses of 44 adolescents and adults who stutter on this modified SOC questionnaire yielded interrelations between the questionnaire items that were consistent with a stage-based interpretation.

Using a modification of the original Stages of Change questionnaire (McConaughy, Prochaska, & Velicer, 1983), the researchers found that confirmatory and exploratory factor analyses of participant responses indicated that the affective, cognitive and behavioural factors that characterise stuttering discriminate the stages of change for individuals moving through treatment.

The psychometric properties of the original SOC questionnaire (McConaughy et al., 1983) have been evaluated in a number of studies (e.g., Pantalon, Nich, Franforter, & Carroll, 2002) which have demonstrated good concurrent and predictive validity (Blanchard, Morgenstem, Morgan, Labouvie & Bux, 2003; DiClemente & Hughes, 1990) and good internal consistency (Carey, Pumine, Maisto & Carey, 1999; Pantalon et al., 2002).

### **3.2.3 Procedure**

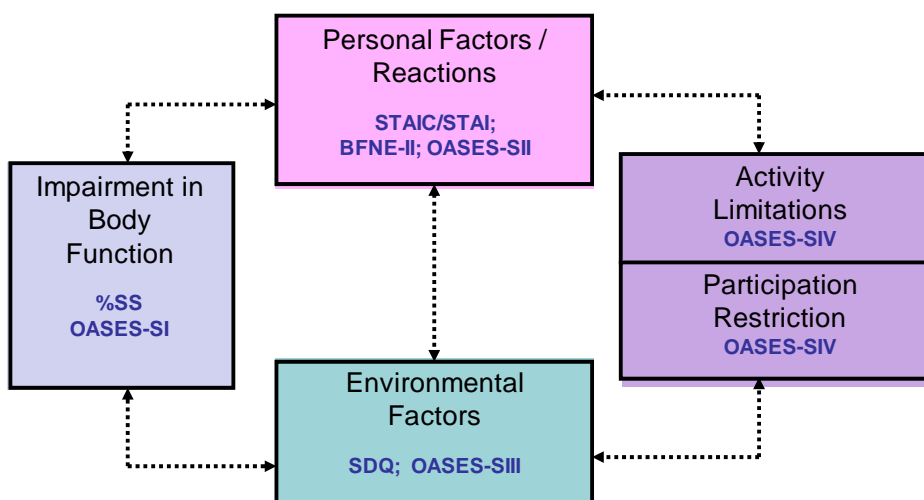
The Curtin University of Technology Human Research Ethics Committee granted ethical approval to conduct this research. Participants who stuttered were recruited through the CUSTC waiting list for the F & C Group Program (Perth, Western Australia). Control participants were recruited through staff and students of the Curtin University of Technology School of Psychology and Speech Pathology.

Eight weeks prior to commencing the F & C Group Program, the parents of the children and adolescents were contacted and informed of the commencement of the next group program and were provided with information sheets and informed consent ethics forms. Parents discussed participation with their son or daughter, who confirmed their willingness to participate further in the research group program. Participants were assessed individually in a quiet room at the CUSTC. An initial 10 minute screening conversation was used to assess the absence of stuttered behaviours in the fluent control participants. A 15 minute recorded conversation sample (based on a series of open-

ended questions designed to elicit language and establish rapport) was obtained for all participants who stuttered and this was digitally recorded. All participants were asked to complete the STAIC (8-11 years of age) or STAI (12 – 17 years of age), BFNE-II, SDQ, OASES, and SOC (12-17 years of age) questionnaires and a case history information sheet (which outlined any history of previous stuttering treatment and pharmacological intervention for anxiety disorders). The order of presentation of questionnaires was counterbalanced to control for order effects.

### 3.3 RESULTS:

The relevant components of the biopsychosocial model (Yaruss and Quesal, 2004) have been reproduced in designated sections of results section. As appropriate, the assessments and questionnaires used have been superimposed onto the Yaruss and Quesal (2004) model sub-components (Figure 3.1).



**Figure 3.1:** Sub-components of the Yaruss & Quesal (2004) model with psychosocial measures superimposed.

Consistent with the Yaruss and Quesal (2004; 2006) model which depicts how the stuttering disorder can be viewed in terms of several interacting components, the sub-sections of the OASES were mapped onto the various model sub-components. The

State and Trait Anxiety Inventory (STAIC & STAI) and Brief Fear of Negative Evaluation (BFNE-II) questionnaires were mapped onto the Personal Factors / Reactions model sub-component as these questionnaire measure psychological constructs. Finally, the Strengths and Difficulties questionnaire (SDQ) which measures behavioural and social difficulties in the family and school environmental setting was mapped onto the Environmental Factors model sub-component.

In addition, Tables presented within the results section will be articulated and highlighted with colour-coding. Blue, pink, green and purple represent psychosocial measures related to Impairment in Body Function, Personal Factors/Reactions, Environmental Factors and Quality of Life. Although not specifically a part of the Yaruss and Quesal (2004) model, yellow will represent results obtained from the Stage of Change measure provided to the adolescents in this study.

### **3.3.1 Descriptive Data Analysis**

The data was scanned for any univariate and multivariate outliers with no significant outliers identified. Mahalanobis distances were computed to identify any multivariate outliers with no significant outliers found. Descriptive statistics were computed for the %SS, STAIC (state and trait), STAI (state and trait), BFNE-II, SDQ, OASES (Sections I, II, III & IV), SOC (precontemplation, contemplation, action & maintenance), and Age, and are shown in Tables 3.3 and 3.4. Effect size was calculated using Cohen's *d* (Cohen, 1988).



Table 3.3: Means and Standard Deviations for CWS (Wait-List) and CWNS

Measures	CWS		CWNS		<i>p</i> value	Effect size
	(N = 39)		(N = 39)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<i>Impairment</i>						
% SS	4.66	2.49	-	-	-	-
OASES-SI	57.05	7.56	47.02	8.39	<.001	1.26
<i>Personal</i>						
STAIC (state)	45.15	4.79	29.21	1.98	<.001	4.35
STAIC (trait)	47.38	5.56	27.62	3.22	<.001	4.34
BFNE-II	42.21	5.30	17.46	4.91	<.001	4.84
OASES-SII	59.11	9.51	34.82	6.00	<.001	3.05
<i>Environmental</i>						
SDQ	12.85	2.31	3.33	1.30	<.001	5.08
OASES-SIII	63.14	10.69	29.13	6.81	<.001	3.80
<i>Quality of Life</i>						
OASES-SIV	56.21	11.08	22.22	5.01	<.001	3.95
Age	9.64	1.06	9.67	1.03	.91	.03

### 3.3.2 Between Group Comparisons

#### 3.3.2.1 Children

An independent samples *t*-test showed no significant difference between the ages of CWS and CWNS,  $t(76) = -.11, p = .91$ .

Mean scores obtained on the STAIC, BFNE-II, and SDQ questionnaires from CWS and CWNS were compared to published normative data reported in the literature (Spielberger, 1973; Carleton et al., 2007; Mellor, 2005). The mean scores obtained on the OASES questionnaire were compared to the impact rating scales reported by Yaruss and Quesal (2006, 2008).

In addition, independent samples *t*-tests were computed to test for significant differences between the group of CWS and the fluent CWNS group in this study on Age, STAIC (state and trait anxiety sections), BFNE-II, SDQ, and OASES (Sections I, II, III & IV). The results obtained (as shown in Table 3.3) demonstrated significant differences between the groups on all measures with large effect sizes (Howell, 2007). An alpha level of .05 (two-tailed) was used for all statistical tests.

#### *Impairment in Body Function*

The majority (69%) of CWS demonstrated a moderately severe stuttered severity (2-5 %SS) with the remaining 31% demonstrating severe stuttered severity (>5 %SS) as classified by Guitar (2006).

Mean scores obtained which assessed self-awareness of speaking ability and knowledge of stuttering (OASES-SI) corresponded to a higher moderate impact rating for the CWS compared to the mild-to-moderate impact rating obtained for the CWNS (Yaruss and Quesal, 2006, 2008). This significantly higher impact rating demonstrated that CWS reported more self-aware of their speaking abilities compared to their fluent peers,  $t(76) = 5.55, p < .001$ .

### *Personal Factors / Reactions*

Mean scores obtained on the state and trait anxiety inventory (STAIC) for CWS were above the mean for state ( $M = 31.00$ ) and trait ( $M = 38.00$ ) anxiety scores reported in published normative data for school children younger than 11 years of age (Spielberger, 1973), indicating that the CWS scored above normal clinical limits. In contrast, the mean scores obtained for CWNS were below the state and trait anxiety published normative values. A comparison between the means showed that CWS demonstrated significantly higher state anxiety scores,  $t(76) = 19.23, p < .001$ ; and significantly higher trait anxiety scores,  $t(76) = 19.23, p < .001$  compared to their fluent peers.

Mean scores for CWS obtained from the fear of negative evaluation questionnaire (BFNE-II) were above the mean scores of 19.68 (for males) and 25.20 (for females) reported in published normative data for university students (Carleton et al., 2007), indicating that the CWS scored above normal clinical limits. The mean scores obtained for CWNS were below these published normative values. The CWS in this study demonstrated a significantly greater fear of being negatively evaluated,  $t(76) = 21.39, p < .001$  compared to their fluent peers.

Mean scores obtained which assessed reactions to stuttering/speaking ability (OASES-SII) corresponded to a higher moderate impact rating for the CWS compared to the mild-to-moderate impact rating for the CWNS. This data indicates that CWS reported greater reactions to their stuttering/speaking abilities compared to CWNS and this difference was statistically significant,  $t(76) = 13.49, p < .001$ .

### *Environmental Factors*

Mean scores of behavioural and social difficulties (SDQ) reported by the CWS were above the mean scores of 9.72 (children younger than 11) reported in published

normative data of Australian children (Mellor, 2005), indicating that the CWS scored in the clinical range of behavioural and social difficulties. In contrast, the mean score obtained for CWNS was below these published normative values. This result demonstrates that CWS compared to CWNS showed significantly higher behavioural and social difficulties,  $t(76) = 22.38, p < .001$ .

Mean scores obtained which assessed communication difficulties in daily situations (OASES-SIII) corresponded to a higher moderate-to-severe impact rating for the CWS compared to a mild impact rating for the CWNS. This data indicates that CWS showed significantly greater communication difficulties in daily situations compared to their fluent peers,  $t(76) = 16.76, p < .001$ .

### *Quality of Life*

Mean scores obtained which assessed quality of life (OASES-SIV) corresponded to a higher moderate impact rating for the CWS compared to a mild impact rating for the CWNS. A comparison between the means showed that CWS compared to CWNS, demonstrated significantly reduced quality of life,  $t(76) = 17.46, p < .001$ .

Table 3.4: Means and Standard Deviations for AWS (Wait-List) and AWNS

Measures	AWS		AWNS		<i>p</i> value	Effect size
	(N = 36)		(N = 36)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<i>Impairment</i>						
% SS	5.95	3.93	-	-	-	-
OASES-SI	61.25	8.93	41.60	7.87	<.001	2.33
<i>Personal</i>						
STAI (state)	54.81	4.73	38.83	2.67	<.001	4.16
STAI (trait)	56.56	2.81	39.47	3.53	<.001	5.36
BFNE-II	46.83	4.52	18.67	3.70	<.001	6.82
OASES-SII	63.94	7.56	32.80	4.55	<.001	5.00
<i>Environmental</i>						
SDQ	13.89	1.75	2.92	0.69	<.001	8.25
OASES-SIII	65.22	9.00	30.02	6.20	<.001	4.55
<i>Quality of Life</i>						
OASES-SIV	58.58	10.32	21.56	4.59	<.001	4.64
<i>Stage of Change</i>						
SOC (PRE)	33.08	4.38	-	-	-	-
SOC (CONT)	29.56	5.42	-	-	-	-
SOC (ACTION)	24.92	5.02	-	-	-	-
SOC (MAINT)	25.94	3.93	-	-	-	-
Age	13.69	1.67	13.72	1.67	.94	.02

### 3.3.2.2 Adolescents

An independent samples *t*-test showed no significant difference between the ages of AWS and AWNS,  $t(70) = -.07, p = .94$ .

Mean scores obtained on the STAI, BFNE-II, and SDQ questionnaires from AWS and AWNS were compared to published normative data reported in the literature (Spielberger, 1983; Carleton et al., 2007; Mellor, 2005). The mean scores obtained on the OASES questionnaire were compared to the impact rating scales reported by Yaruss and Quesal (2006, 2008). The mean scores on the Stage of Change questionnaire were used to position the AWS onto the various stages of the readiness for change model (Floyd et al., 2007).

Independent samples *t*-tests were also computed to test for significant differences between the AWS and the fluent AWNS groups on STAI (state and trait anxiety sections), BFNE-II, SDQ, and OASES (Sections I, II, III & IV). The results obtained (as shown in Table 3.4) demonstrated significant differences between the groups on all measures with large effect sizes (Howell, 2007). An alpha level of .05 (two-tailed) was used for all statistical tests.

#### *Impairment in Body Function*

Fifty six percent of the AWS demonstrated moderately severe stuttered severity (2-5 %SS) and forty four percent demonstrated severe stuttered severity (>5 %SS) as classified by Guitar (2006).

Mean scores obtained which assessed self-awareness of speaking ability and knowledge of stuttering (OASES-SI) corresponded to a higher moderate-to-severe impact rating for the AWS compared to the mild-to-moderate impact rating for the AWNS (Yaruss and Quesal, 2006; 2008). This significantly higher impact rating demonstrated that AWS reported more self awareness of their speaking abilities compared to their fluent peers,  $t(70) = 9.90, p < .001$ .

### *Personal Factors / Reactions*

Mean scores obtained for the state and trait anxiety inventory (STAI) for AWS were above the mean for state ( $M = 39.45$ ) and trait ( $M = 40.17$ ) anxiety scores reported in published normative data for high school students (Spielberger, 1983), indicating that the AWS scored above normal clinical limits. In contrast, the mean scores obtained for AWNS were below the state and trait published normative values. A comparison between the means showed that AWS demonstrated significantly higher state anxiety scores,  $t(70) = 17.64, p < .001$ ; and significantly higher trait anxiety scores,  $t(70) = 22.70, p < .001$  compared to their fluent peers.

Mean scores for AWS obtained from the fear of negative evaluation questionnaire (BFNE-II) were above the mean scores of 19.68 (for males) and 25.20 (for females) reported in normative data for university students (Carleton et al., 2007), indicating that the AWS scored above normal clinical limits. The mean scores obtained for AWNS were below these published normative values. The AWS in this study demonstrated a significantly greater fear of being negatively evaluated,  $t(70) = 28.95, p < .001$  compared to their fluent peers.

Mean scores obtained which assessed reactions to stuttering/speaking ability (OASES-SII) corresponded to a higher moderate-to-severe impact rating for the AWS compared to the mild-to-moderate impact rating for the AWNS. The data demonstrated that AWS showed greater reactions to their stuttering /speaking abilities compared to AWNS and the difference was statistically significant,  $t(70) = 21.18, p < .001$ .

### *Environmental Factors*

Mean scores of behavioural and social difficulties (SDQ) reported by the AWS were above the mean scores of 8.72 (children older than 11) reported in published

normative data of Australian children (Mellor, 2005), indicating that the AWS scored in the clinical range of behavioural and social difficulties. In contrast, the mean score obtained for AWNS was below these published normative values. This result demonstrated that AWS compared to AWNS showed significantly higher behavioural and social difficulties,  $t(70) = 34.93, p < .001$ .

Mean scores obtained which assessed communication difficulties in daily situations (OASES-SIII) corresponded to a higher moderate-to-severe impact rating for the AWS compared to a mild impact rating for the AWNS. This data demonstrates that AWS showed significantly greater communication difficulties in daily situations compared to their fluent peers,  $t(70) = 19.32, p < .001$ .

### *Quality of Life*

Mean scores obtained which assessed quality of life (OASES-SIV) corresponded to a higher moderate impact rating for the AWS compared to a mild impact rating for the AWNS. A comparison between the means showed that AWS compared to AWNS, demonstrated significantly reduced quality of life,  $t(70) = 19.66, p < .001$ .

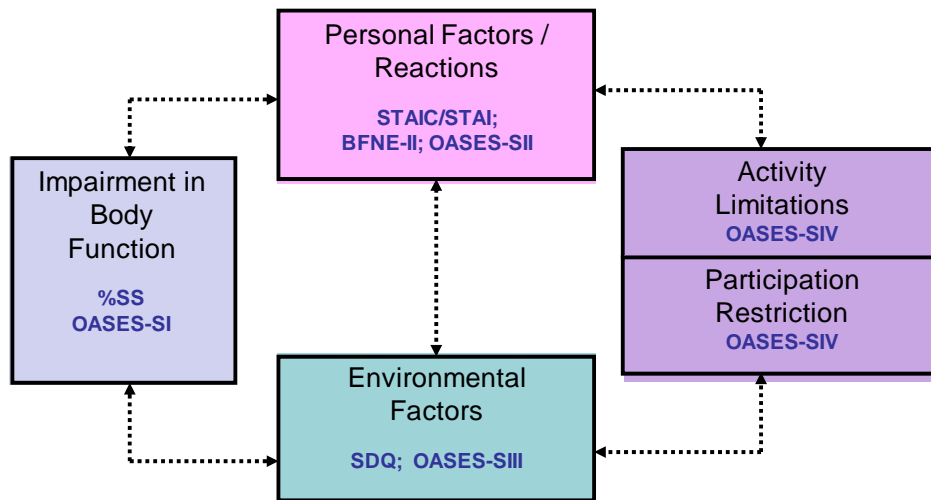
### *Stage of Change*

Mean scores obtained for the Stage of Change questionnaire demonstrated that the majority of AWS were positioned between the 'precontemplation' and 'contemplation' stage of readiness for change (Floyd et al., 2007). This results therapeutically positions the AWS between a stage of not recognising a need for change (precontemplation) and ambivalence about change at present however an intention to change in the future (contemplation).



### 3.3.3 Correlations Between Variables

Pearson product moment correlations were computed to determine the inter-relationship between each measure within each group. Figure 3.2 presents a schematised version of the Yaruss and Quesal (2004) sub-components with the psychosocial measures superimposed.



**Figure 3.2:** Sub-components of the Yaruss & Quesal (2004) model with psychosocial measures superimposed.

#### 3.3.3.1 Children

Table 3.5 and 3.6 presents the correlations for these study variables for both the CWS and the fluent CWNS.

##### *Impairment in Body Function*

Within the group of CWS, severity of stuttering (%SS) was significantly associated with self-awareness and knowledge of stuttering (OASES-SI),  $r(37) = .44$ ,  $p < .01$ .

##### *Personal Factors/Reactions*

Within the group of CWS, statistically significant correlations were obtained between state and trait anxiety (STAIC),  $r(37) = .73$ ,  $p < .001$ ; state anxiety and BFNE-

fear of negative evaluation (BFNE-II),  $r(37) = .38, p = .02$ ; and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-II),  $r(37) = .49, p < .01$ .

Within the group of CWNS, statistically significant correlations were obtained between state and trait anxiety (STAIC),  $r(37) = .56, p < .001$ ; state anxiety and BFNE-fear of negative evaluation (BFNE-II),  $r(37) = .32, p = .05$ ; and trait anxiety and fear of negative evaluation (BFNE-II),  $r(37) = .53, p < .001$ .

#### *Environmental Factors*

Children who stutter demonstrated a statistically significant association between behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .40, p = .01$ .

#### *Impairment in Body Function and Personal Factors/Reactions*

Within the cohort of CWS, statistically significant correlations were obtained between severity of stuttering (%SS) and trait anxiety,  $r(37) = .34, p = .03$ ; severity of stuttering and reactions to stuttering (OASES-SII),  $r(37) = .41, p < .01$ ; self-awareness and knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(37) = .58, p < .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and reactions to stuttering (OASES-SII),  $r(37) = .61, p < .001$ .

Within the cohort of CWNS, statistically significant correlations were obtained between self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(37) = -.45, p < .01$ ; and self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and reactions to speaking ability (OASES-SII),  $r(37) = .51, p = .001$ .

#### *Impairment in Body Function and Environmental Factors*

Children who stutter demonstrated statistically significant associations between severity of stuttering (%SS) and behavioural and social difficulties (SDQ),  $r(37) = .43$ ,

$p < .01$ ; severity of stuttering and communication difficulties in daily situations (OASES-SIII),  $r(37) = .49$ ,  $p < .01$ ; self-awareness and knowledge of stuttering (OASES-SI) and behavioural and social difficulties (SDQ),  $r(37) = .39$ ,  $p = .02$ ; and self-awareness and knowledge of stuttering (OASES-SI) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .66$ ,  $p < .001$ .

Children who do not stutter demonstrated statistically significant associations between self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and behavioural and social difficulties (SDQ),  $r(37) = .38$ ,  $p = .02$ .

#### *Impairment in Body Function and Activity Limitations / Participation Restriction*

Within the group of CWS, statistically significant relationships were obtained between severity of stuttering (%SS) and quality of life (OASES-SIV),  $r(37) = .52$ ,  $p = .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and quality of life (OASES-SIV),  $r(37) = .46$ ,  $p < .01$ .

Within the group of CWNS, a statistically significant relationship was obtained between self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and quality of life (OASES-SIV),  $r(37) = .40$ ,  $p = .01$ .

#### *Personal Factors / Reactions and Environmental Factors*

Children who stutter demonstrated statistically significant correlations between state anxiety and communication difficulties in daily situations (OASES-SIII),  $r(37) = .33$ ,  $p = .04$ ; fear of negative evaluation (BFNE-II) and behavioural and social difficulties (SDQ),  $r(37) = .34$ ,  $p = .04$ ; BFNE-II (behavioural and social difficulties) and OASES-SIII (communication difficulties in daily situations),  $r(37) = .62$ ,  $p < .001$ ; and OASES-SII (reactions to stuttering) and OASES-SIII (communication difficulties in daily situations),  $r(37) = .72$ ,  $p < .001$ .

Children who do not stutter demonstrated a statistically significant strong correlation between reactions to speaking ability (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .80, p < .001$ .

*Personal Factors / Reactions and Activity Limitations / Participation Restriction*

Children who stutter demonstrated statistically significant associations between state anxiety and quality of life (OASES-SIV),  $r(37) = .32, p < .05$ ; fear of negative evaluation (BFNE-II) and quality of life (OASES-SIV),  $r(37) = .52, p = .001$ ; and reactions to stuttering (OASES-SII) and quality of life (OASES-SIV),  $r(37) = .84, p < .001$ .

Children who do not stutter demonstrated a strong statistically significant association between reactions to speaking ability (OASES-SII) and quality of life (OASES-SIV),  $r(37) = .92, p < .001$ .

*Environmental Factors and Activity Limitations / Participation Restriction*

Within the group of CWS, statistically significant relationships were obtained between behavioural and social difficulties (SDQ) and quality of life (OASES-SIV),  $r(37) = .50, p = .001$ ; and communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(37) = .81, p < .001$ .

Within the group of CWNS, a statistically significant relationships was obtained between communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(37) = .75, p < .001$ .

Table 3.5: Intercorrelations for CWS (Wait-List,  $N = 39$ )

Measures	%SS	OASES-SI	STAIC-S	STAIC-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	AGE
%SS	-	.44**	.24	.34*	.30	.41**	.43**	.49**	.52**	-.15
OASES-SI		-	.06	.16	.58**	.61**	.39*	.66**	.46**	.09
STAIC (state)			-	.73**	.38*	.10	.15	.33*	.32*	-.02
STAIC (trait)				-	.26	.07	.16	.28	.27	-.00
BFNE-II					-	.49**	.34*	.62**	.52**	.19
OASES-SII						-	.31	.72**	.84**	.28
SDQ							-	.40*	.50**	-.13
OASES-SIII								-	.81**	.15
OASES-SIV									-	.21
AGE										-

Note. \* $p < .05$ , \*\* $p < .01$

Table 3.6: Intercorrelations for CWNS ( $N = 39$ )

Measures	OASES-SI	STAIC-S	STAIC-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	AGE
OASES - SI	-	-.21	-.18	-.45**	.51**	.38*	.28	.40*	-.17
STAIC (state)		-	.56**	.32*	.21	-.12	.19	.20	.11
STAIC (trait)			-	.53**	.16	-.04	.16	.09	-.07
BFNE-II				-	-.23	-.15	-.16	-.23	-.17
OASES – SII					-	.08	.80**	.92**	-.10
SDQ						-	-.02	.17	.05
OASES – SIII							-	.75**	.20
OASES – SIV								-	.16
AGE									-

Note. \* $p < .05$ , \*\* $p < .01$

### 3.3.3.2 Adolescents

Table 3.7 and 3.8 represents the correlations for these study variables for both the AWS and the fluent AWNS.

#### *Impairment in Body Function*

Adolescents who stutter demonstrated a statistically significant correlation between severity of stuttering (%SS) and self-awareness and knowledge of stuttering (OASES-SI),  $r(34) = .44, p < .01$ .

#### *Personal Factors/Reactions*

Within the group of AWS, statistically significant associations were obtained between state and trait anxiety (STAI),  $r(34) = .69, p < .001$ ; state anxiety and fear of negative evaluation (BFNE-II),  $r(34) = .55, p < .001$ ; state anxiety and reactions to stuttering (OASES-SII),  $r(34) = .43, p = .01$ ; trait anxiety and fear of negative evaluation (BFNE-II),  $r(34) = .38, p = .02$ ; and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII),  $r(34) = .46, p < .01$ .

Within the group of AWNS, statistically significant associations were obtained between state and trait anxiety (STAI),  $r(34) = .96, p < .001$ ; and fear of negative evaluation (BFNE-II) and reactions to speaking ability (OASES-SII),  $r(34) = .33, p = .05$ .

#### *Environmental Factors*

Adolescents who do not stutter demonstrated a statistically significant correlation between behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII),  $r(34) = .40, p < .05$ .

### *Impairment of Body Function and Personal Factors/Reactions*

Adolescents who stutter showed statistically significant associations between severity of stuttering (%SS) and state anxiety,  $r(34) = .43, p < .01$ ; severity of stuttering and trait anxiety,  $r(34) = .60, p < .001$ ; and severity of stuttering and reactions to stuttering (OASES-SII),  $r(34) = .36, p = .03$ . In addition, statistically significant associations were also obtained between self-awareness and knowledge of stuttering (OASES-SI) and state anxiety,  $r(34) = .60, p < .001$ ; self-awareness and knowledge of stuttering (OASES-SI) and trait anxiety,  $r(34) = .52, p = .001$ ; self-awareness and knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(34) = .69, p < .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and reactions to stuttering (OASES-SII),  $r(34) = .60, p < .001$ .

Adolescents who do not stutter showed statistically significant associations between self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(34) = .48, p < .01$ ; and self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and reactions to speaking ability (OASES-SII),  $r(34) = .45, p < .01$ .

### *Impairment in Body Function and Environmental Factors*

Within the cohort of AWS, a strong statistically significant correlation was obtained between self-awareness and knowledge of stuttering (OASES-SI) and communication difficulties in daily situations (OASES-SIII),  $r(34) = .76, p < .001$ .

Within the cohort of AWNS, a statistically significant correlation was obtained between self-awareness of speaking ability / knowledge of stuttering (OASES-SI) and behavioural and social difficulties (SDQ),  $r(34) = .35, p = .04$ .



### *Impairment of Body Function and Activity Limitations / Participation Restriction*

Adolescents who stutter demonstrated a statistically significant relationship between self-awareness and knowledge of stuttering (OASES-SI) and quality of life (OASES-SIV),  $r(34) = .54, p = .001$ .

### *Personal Factors / Reactions and Environmental Factors*

Adolescents who stutter demonstrated statistically significant relationships between state anxiety and communication difficulties in daily situations (OASES-SIII),  $r(34) = .55, p = .001$ ; trait anxiety and communication difficulties in daily situations (OASES-SIII),  $r(34) = .40, p = .02$ ; fear of negative evaluation (BFNE-II) and behavioural and social difficulties (SDQ),  $r(34) = .49, p < .01$ ; fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),  $r(34) = .59, p < .001$ ; and reactions to stuttering (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(34) = .82, p < .001$ .

Adolescents who do not stutter demonstrated statistically significant relationships between reactions to speaking ability (OASES-SII) and behavioural and social difficulties (SDQ),  $r(34) = .36, p = .03$ ; and reactions to speaking ability (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(34) = .51, p = .001$ .

### *Personal Factors / Reactions and Activity Limitations / Participation Restriction*

Within the group of AWS, statistically significant correlations were obtained between state anxiety and quality of life (OASES-SIV),  $r(34) = .44, p < .01$ ; fear of negative evaluation (BFNE-II) and quality of life (OASES-SIV),  $r(34) = .52, p = .001$  and reactions to stuttering (OASES-SII) and quality of life (OASES-SIV),  $r(34) = .90, p < .001$ .

Within the group of AWNS, a statistically significant correlation was obtained between reactions to speaking ability (OASES-SII) and quality of life (OASES-SIV),  $r(34) = .61, p < .001$ .

#### *Environmental Factors and Activity Limitations / Participation Restriction*

Adolescents who stutter demonstrated a strong statistically significant association between communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(34) = .79, p < .001$ .

Adolescents who do not stutter demonstrated a statistically significant association between communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(34) = .39, p = .02$ .

#### *Stage of Change*

The stages of readiness for change were defined as precontemplation, contemplation, action and maintenance. Analysis of AWS responses demonstrated that adjacent stages of readiness were more highly correlated than non-adjacent stages with statistically significant correlations obtained between contemplation and action,  $r(34) = .84, p < .001$ ; contemplation and maintenance,  $r(34) = .79, p < .001$ ; and action and maintenance,  $r(34) = .91, p < .001$ .

#### *Age*

Within the group of AWS, statistically significant correlations were obtained between Age and severity of stuttering,  $r(34) = .33, p = .05$ ; state anxiety,  $r(34) = .40, p = .01$ ; fear of negative evaluation (BFNE-II),  $r(34) = .33, p = .05$ ; the precontemplation stage of readiness,  $r(34) = .66, p < .001$ ; the contemplation stage of readiness,  $r(34) = -.43, p = .01$ ; the action stage of readiness,  $r(34) = -.47, p < .01$ ; and the maintenance stage of readiness,  $r(34) = -.45, p < .01$ .

Within the group of AWNS, a statistically significant correlation was obtained between Age and fear of negative evaluation (BFNE-II),  $r(34) = -.42, p = .01$ .

Table 3.7: Intercorrelations for AWS (Wait-list,  $N = 36$ )

Measures	% SS	OASES-SI	STAI-S	STAI-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	SOC (PRE)	SOC (CONT)	SOC (ACT)	SOC (MAIN)	AGE
% SS	-	.44**	.43**	.60**	.30	.36*	.16	.32	.31	.27	-.05	-.04	-.19	.33*
OASES-SI		-	.60**	.52**	.69**	.60**	.15	.76**	.54**	-.03	-.01	-.08	-.13	.19
STAI (state)			-	.69**	.55**	.43**	.30	.55**	.44**	.13	-.09	-.12	-.19	.40*
STAI (trait)				-	.38*	.31	.20	.40*	.22	.21	.27	.24	.11	.23
BFNE-II					-	.46**	.49**	.59**	.52**	-.06	-.16	-.17	-.18	.33*
OASES-SII						-	.22	.83**	.90**	.28	.02	-.13	-.11	.27
SDQ							-	.26	.32	-.06	-.08	.00	.07	.21
OASES-SIII								-	.79**	.04	.01	-.08	-.11	.25
OASES-SIV									-	.18	-.11	-.21	-.21	.33
SOC (PRE)										-	-.18	-.16	-.11	.66*
SOC (CONT)											-	.84**	.79**	-.43*
SOC (ACT)												-	.91**	-.47**
SOC (MAIN)													-	-.45**
AGE														-

Table 3.8: Intercorrelations for AWNS ( $N = 36$ )

Measures	OASES-SI	STAI-S	STAI-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	AGE
OASES-SI	-	-.24	-.31	.48**	.45**	.35*	.05	.09	-.28
STAI (state)		-	.96**	.21	-.02	-.04	-.02	.21	.23
STAI (trait)			-	.10	-.14	-.10	-.04	.14	.29
BFNE-II				-	.33*	.28	.03	.23	-.42*
OASES-SII					-	.36*	.51**	.61**	-.11
SDQ						-	.40*	.04	.33
OASES-SIII							-	.39*	.13
OASES-SIV								-	-.16
AGE									-

Note. \* $p < .05$ , \*\* $p < .01$ .

### 3.3.4 Fisher r-to-z transformation

#### 3.3.4.1 Children Who Stutter and Children Who Do Not Stutter

A Fisher *r*-to-*z* transformation was applied to the data to test for significant differences between the correlation coefficients obtained for each comparison within each group (Cohen & Cohen, 2003). Statistically significant differences were found between the correlation coefficients as shown in Table 3.9.

##### *Personal Factors / Reactions*

Children who stutter demonstrated a statistically significant stronger association between fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-II) compared to CWNS,  $z = 3.27, p = .001$ .

##### *Impairment in Body Function and Personal Factors*

Children who stutter demonstrated a statistically significant stronger relationship between self-awareness of speaking ability (OASES-SI) and fear of negative evaluation (BFNE-II) compared to their fluent peers,  $z = 4.87, p < .001$ .

##### *Impairment in Body Function and Environmental Factors*

Children who stutter exhibited a statistically significant stronger association between self-awareness of speaking ability (OASES-I) and communication difficulties in daily situations (OASES-SIII) compared to CWNS,  $z = 2.14, p = .03$ .

##### *Personal Factors / Reactions and Environmental Factors*

Children who stutter exhibited statistically significant higher correlations between fear of negative evaluation (BFNE-II) and behavioural and social difficulties (SDQ),  $z = 2.14, p = .03$ ; and fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),  $z = 3.76, p < .001$  compared to fluent peers.

Table 3.9: Comparison of Intercorrelations for CWS and CWNS

Measures	Correlation Coefficient		<i>z</i>	<i>P</i>
	CWS	CWNS		value (2-tailed)
<b>Personal</b>				
STAIC (state) vs STAIC (trait)	.73**	.56**	1.26	.21
STAIC (state) vs BFNE-II	.38*	.32*	.29	.77
STAIC (trait) vs BFNE-II	.26	.53**	-1.37	.17
STAIC (state) vs OASES-SII	.10	.21	-.48	.63
STAIC (trait) vs OASES-SII	.07	.16	-.39	.70
BFNE-II vs OASES-SII	.49**	-.23	3.27	.001
<b>Environmental</b>				
SDQ vs OASES-SIII	.40*	-.02	1.88	.06
<b>Impairment vs Personal</b>				
OASES-SI vs STAIC (state)	.06	-.21	1.16	.25
OASES-SI vs STAIC (trait)	.16	-.18	1.46	.14
OASES-SI vs BFNE-II	.58**	-.45**	4.87	<.001
OASES-SI vs OASES-SII	.61**	.51**	.62	.54
<b>Impairment vs Environmental</b>				
OASES-SI vs SDQ	.39*	.38*	.05	.96
OASES-SI vs OASES-SIII	.66**	.28	2.14	.03
<b>Impairment vs QoL</b>				
OASES-SI vs OASES-SIV	.46**	.40*	.31	.76
<b>Personal vs Environmental</b>				
STAIC (state) vs SDQ	.15	-.12	1.15	.25
STAIC (trait) vs SDQ	.16	-.04	.85	.40
BFNE-II vs SDQ	.34*	-.15	2.14	.03
OASES-SII vs SDQ	.31	.08	1.02	.31
STAIC (state) vs OASES-SIII	.33*	.19	.64	.52
STAIC (trait) vs OASES-SIII	.28	.16	.54	.59
BFNE-II vs OASES-SIII	.62**	-.16	3.76	<.001
OASES-SII vs OASES-SIII	.72**	.80**	-.81	.42
<b>Personal vs QoL</b>				
STAIC (state) vs OASES-SIV	.32*	.20	.55	.58
STAIC (trait) vs OASES-SIV	.27	.09	.79	.43
BFNE-II vs OASES-SIV	.52**	-.23	3.44	<.001
OASES-SII vs OASES-SIV	.84**	.92**	-1.56	.12
<b>Environmental vs QoL</b>				
SDQ vs OASES-SIV	.50**	.17	1.60	.11
OASES-SIII vs OASES-SIV	.81**	.75**	.65	.52

Note. \* $p < .05$ , \*\* $p < .01$

### *Personal Factors and Quality of Life*

Children who stutter demonstrated a statistically significant stronger relationship between fear of negative evaluation (BFNE-II) and quality of life (OASES-SIV) compared to their fluent peers,  $z = 3.44, p < .001$ .

#### 3.3.4.2 Adolescents Who Stutter and Adolescents Who Do Not Stutter

A Fisher  $r$ -to- $z$  transformation was applied to the data to test for significant differences between the correlation coefficients obtained for each comparison within each group (Cohen & Cohen, 2003). Statistically significant differences were found between the correlation coefficients as shown in Table 3.10.

### *Personal Factors / Reactions*

Adolescents who stutter demonstrated statistically significant higher correlations between state anxiety and trait anxiety,  $z = -4.46, p < .001$ ; and state anxiety and reactions to speaking ability (OASES-SII),  $z = 1.95, p = .05$  compared to AWNS.

### *Impairment in Body Function and Personal Factors / Reactions*

Adolescents who stutter demonstrated statistically significant stronger associations between self-awareness of speaking ability (OASES-SI) and state anxiety,  $z = 3.81, p < .001$  and self-awareness of speaking ability (OASES-SI) and trait anxiety,  $z = 3.64, p < .001$  compared to fluent peers.

### *Impairment in Body Function and Environmental Factors*

Adolescents who stutter demonstrated statistically significant stronger relationships between self-awareness of speaking ability (OASES-SI) and communication difficulties in daily situations (OASES-SIII) compared to AWNS,  $z = 3.84, p < .001$ .

Table 3.10: Comparison of Intercorrelations for AWS and AWNS

Measures	Correlation Coefficient		z	P value
	AWS	AWNS		(2-tailed)
<b>Personal</b>				
STAI (state) vs STAI (trait)	.69**	.96**	-4.46	<.001
STAI (state) vs BFNE-II	.55**	.21	1.65	.10
STAI (trait) vs BFNE-II	.38*	.10	1.22	.22
STAI (state) vs OASES-SII	.43**	-.02	1.95	.05
STAI (trait) vs OASES-SII	.31	-.14	1.87	.06
BFNE-II vs OASES-SII	.46**	.33*	.63	.53
<b>Environmental</b>				
SDQ vs OASES-SIII	.26	.40*	-.64	.52
<b>Impairment vs Personal</b>				
OASES-SI vs STAI (state)	.60**	-.24	3.81	<.001
OASES-SI vs STAI (trait)	.52**	-.31	3.64	<.001
OASES-SI vs BFNE-II	.69**	.48**	1.32	.19
OASES-SI vs OASES-SII	.60**	.45**	.85	.40
<b>Impairment vs Environmental</b>				
OASES-SI vs SDQ	.15	.35*	-.87	.38
OASES-SI vs OASES-SIII	.76**	.05	3.84	<.001
<b>Impairment vs QoL</b>				
OASES-SI vs OASES-SIV	.54**	.09	2.09	.04
<b>Personal vs Environmental</b>				
STAI (state) vs SDQ	.30	-.04	1.42	.16
STAI (trait) vs SDQ	.20	-.10	1.23	.22
BFNE-II vs SDQ	.49**	.28	1.01	.31
OASES-SII vs SDQ	.22	.36*	-.62	.54
STAI (state) vs OASES-SIII	.55**	-.02	2.59	<.01
STAI (trait) vs OASES-SIII	.40*	-.04	1.88	.06
BFNE-II vs OASES-SIII	.59**	.03	2.63	<.01
OASES-SII vs OASES-SIII	.82**	.51**	2.41	.02
<b>Personal vs QoL</b>				
STAI (state) vs OASES-SIV	.44**	.21	1.05	.29
STAI (trait) vs OASES-SIV	.22	.14	.34	.73
BFNE-II vs OASES-SIV	.52**	.23	1.39	.16
OASES-SII vs OASES-SIV	.90**	.61**	3.10	<.01
<b>Environmental vs QoL</b>				
SDQ vs OASES-SIV	.32	.04	1.18	.24
OASES-SIII vs OASES-SIV	.79**	.39*	2.65	<.01

Note. \*p&lt;.05, \*\*p&lt;.01.



### *Impairment in Body Function and Quality of Life*

Adolescents who stutter demonstrated statistically significant higher correlations between self-awareness of speaking ability (OASES-SI) and quality of life (OASES-SIV) compared to AWNS,  $z = 2.09, p = .04$ .

### *Personal Factors / Reactions and Environmental Factors*

Adolescents who stutter demonstrated statistically significant stronger associations between state anxiety and communication difficulties in daily situations (OASES-SIII),  $z = 2.59, p < .01$ ; fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),  $z = 2.63, p < .01$ ; and reactions to speaking ability (OASES-SII) and communication difficulties in daily situations (OASES-SIII) compared to fluent peers,  $z = 2.41, p = .02$ .

### *Personal Factors / Reactions and Quality of Life*

Adolescents who stutter demonstrated statistically significant stronger relationships between reactions to speaking ability (OASES-SII) and poorer quality of life (OASES-SIV) compared to AWNS,  $z = 3.10, p < .01$ .

### *Environmental Factors and Quality of Life*

Adolescents who stutter demonstrated statistically significant higher correlations between communication difficulties in daily situations (OASES-SIII) and reduced quality of life (OASES-SIV) compared to fluent peers,  $z = 2.65, p < .01$ .

#### 3.3.4.3 Children Who Stutter and Adolescents Who Stutter

Using a Fisher  $r$ -to- $z$  transformation, differences between the correlation coefficients as shown in Table 3.11.

### *Impairment in Body Function and Personal Factors / Reactions*

Adolescents who stutter demonstrated a statistically significant higher correlations between self-awareness and knowledge of stuttering (OASES-SI) and state anxiety,  $z = -2.63, p < .01$  compared to children who stutter.

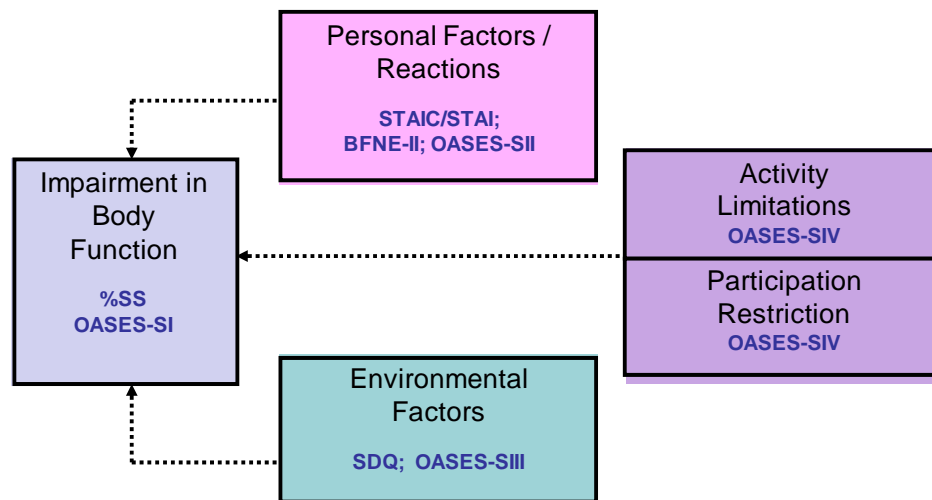
Table 3.11: Comparison of Intercorrelations for CWS and AWS

Measures	Correlation Coefficient		z	p value (2-tailed)
	CWS	AWS		
<b>Impairment</b>				
% SS vs OASES-SI	.44**	.44**	.00	1.00
<b>Personal</b>				
STAIC (state) vs STAIC (trait)	.73**	.69**	.33	.74
STAIC (state) vs BFNE-II	.38*	.55**	-.91	.36
STAIC (trait) vs BFNE-II	.26	.38*	-.56	.58
STAIC (state) vs OASES-SII	.10	.43**	-1.49	.14
STAIC (trait) vs OASES-SII	.07	.31	-1.04	.30
BFNE-II vs OASES-SII	.49**	.46**	.16	.87
<b>Environmental</b>				
SDQ vs OASES-SIII	.40*	.26	.65	.52
<b>Impairment vs Personal</b>				
OASES-SI vs STAI (state)	.06	.60**	-2.63	<.01
OASES-SI vs STAI (trait)	.16	.52**	-1.72	.09
OASES-SI vs BFNE-II	.58**	.69**	-.77	.44
OASES-SI vs OASES-SII	.61**	.60**	.07	.94
<b>Impairment vs Environmental</b>				
OASES-SI vs SDQ	.39*	.15	1.08	.28
OASES-SI vs OASES-SIII	.66**	.76**	-.84	.40
<b>Impairment vs QoL</b>				
OASES-SI vs OASES-SIV	.46**	.54**	-.44	.66
<b>Personal vs Environmental</b>				
STAIC (state) vs SDQ	.15	.30	-.66	.51
STAIC (trait) vs SDQ	.16	.20	-.17	.87
BFNE-II vs SDQ	.34*	.49**	-.76	.45
OASES-SII vs SDQ	.31	.22	.40	.69
STAIC (state) vs OASES-SIII	.33*	.55**	-1.14	.25
STAIC (trait) vs OASES-SIII	.28	.40*	-.56	.58
BFNE-II vs OASES-SIII	.62**	.59**	.20	.84
OASES-SII vs OASES-SIII	.72**	.82**	-1.03	.30
<b>Personal vs QoL</b>				
STAIC (state) vs OASES-SIV	.32*	.44**	-.58	.56
STAIC (trait) vs OASES-SIV	.27	.22	.22	.83
BFNE-II vs OASES-SIV	.52**	.52**	.00	1.00
OASES-SII vs OASES-SIV	.84**	.90**	-1.04	.30
<b>Environmental vs QoL</b>				
SDQ vs OASES-SIV	.50**	.32	.90	.37
OASES-SIII vs OASES-SIV	.81**	.79**	.23	.82

Note. \* $p < .05$ , \*\* $p < .01$ .

### 3.3.5 Multiple Regression Analysis

The Yaruss and Quesal (2004) model was designed to depict how the stuttering disorder could be viewed in terms of several interacting components. Standard multiple regression analyses (MRA) was used to evaluate whether combinations of psychosocial variables measured (i.e., STAIC/STAI, BFNE-II, OASES-SII; SDQ, OASES-SIII; and OASES-SIV) were related toward and could account for the variance in the *Impairment in Body Function* component (i.e., %SS and OASES-SI).



**Figure 3.3:** Schematic adaption of the Yaruss and Quesal (2004) model sub-components depicting the various multiple regression analyses performed. Note specific arrow delineations.

Prior to interpreting the results of the MRA, several assumptions were evaluated. First, inspection of the normal probability plots of standardised residuals as well as the scatterplots of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. Second, Mahalanobis distance were calculated and did not exceed the critical  $\chi^2$  for the degrees of freedom (at  $\alpha = .001$ ) for any cases in the data file, indicating that multivariate outliers were not of concern. Third, relatively high tolerances for all predictors in the regression model indicated that multicollinearity would not interfere with our ability to interpret the outcome of the multiple regression analysis.

### 3.3.5.1 Children Who Stutter

#### *Personal Factors / Reactions*

In combination, the four personal factors/reactions predictor variables explained 27.2% of the variance in stuttering severity (%SS),  $R^2 = .272$ , adjusted  $R^2 = .186$ ,  $F(4,34) = 3.17$ ,  $p = .03$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .37$ ).

Collectively, the four personal factors/reactions predictor variables explained 52.5% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .525$ , adjusted  $R^2 = .469$ ,  $F(4,34) = 9.39$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = 1.11$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 3.12.

Table 3.12: Results from MRA of Personal Factors/Reactions in CWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each personal factors/reaction predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
STAIC (state)	-.04	-.07	.002	-.33	.74
STAIC (trait)	.16	.36	.060	1.67	.10
BFNE-II	.03	.05	.002	.29	.77
OASES-SII	.10*	.37	.103	2.19	.04
<b>OASES-SI</b>					
STAIC (state)	-.55	-.35	.053	-1.95	.06
STAIC (trait)	.37	.28	.036	1.60	.12
BFNE-II	.63**	.44	.126	3.00	< .01
OASES-SII	.32**	.41	.125	2.98	< .01

\* $p < .05$ , \*\* $p < .01$

As can be seen in Table 3.12, reactions to stuttering (OASES-SII) was the only significant predictor of severity of stuttering (%SS) and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII) were significant predictors of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

#### *Environmental Factors*

In combination, the two environmental factors predictor variables explained 30.3% of the variance in stuttering severity (%SS),  $R^2 = .303$ , adjusted  $R^2 = .264$ ,  $F(2,36) = 7.83$ ,  $p < .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .43$ ).

Collectively, the two environmental factors predictor variables explained 45.4% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .454$ , adjusted  $R^2 = .424$ ,  $F(2,36) = 15.00$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .83$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 3.13.

Table 3.13: Results from MRA of Environmental Factors in CWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each environmental factor predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
SDQ	.30	.28	.064	1.81	.08
OASES-SIII	.09*	.38	.120	2.49	.02
<b>OASES-SI</b>					
SDQ	.47	.14	.017	1.06	.30
OASES-SIII	.43**	.60	.306	4.49	< .001

\* $p < .05$ , \*\* $p < .01$

The data contained within Table 3.13 demonstrates that communication difficulties in daily situations (OASES-SIII) was the only significant predictor of severity of stuttering (%SS) and self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

#### *Quality of Life*

The quality of life predictor variable explained 27.3% of the variance in stuttering severity (%SS),  $R^2 = .273$ , adjusted  $R^2 = .253$ ,  $F(1,37) = 13.90$ ,  $p = .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .38$ ).

The quality of life predictor variable explained 21.3% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .213$ , adjusted  $R^2 = .192$ ,  $F(1,37) = 10.01$ ,  $p < .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered medium ( $f^2 = .27$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for the predictor in the regression model are reported in Table 3.14.

Table 3.14: Results from MRA of Quality of Life in CWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for the quality of life predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
OASES-SIV	.12**	.52	.274	3.73	.001
<b>OASES-SI</b>					
OASES-SIV	.32**	.46	.213	3.16	< .01

\* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 3.14, quality of life (OASES-SIV) was a significant predictor of both stuttering severity (%SS) and self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

### 3.3.5.2 Adolescents Who Stutter

#### *Personal Factors / Reactions*

In combination, the four personal factors/reactions predictor variables explained 39.6% of the variance in stuttering severity (%SS),  $R^2 = .396$ , adjusted  $R^2 = .318$ ,  $F(4,31) = 5.08$ ,  $p < .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .66$ ).

Collectively, the four personal factors/reactions predictor variables explained 62.9% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .629$ , adjusted  $R^2 = .581$ ,  $F(4,31) = 13.12$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = 1.70$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 3.15.

Table 3.15: Results from MRA of Personal Factors/Reactions in AWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each personal factor/reaction predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
STAI (state)	-.04	-.05	.001	-.25	.81
STAI (trait)	.80**	.57	.171	2.97	<.01
BFNE-II	.02	.02	.000	.12	.91
OASES-SII	.10	.19	.027	1.19	.25
<b>OASES-SI</b>					
STAI (state)	.18	.10	.004	.56	.58
STAI (trait)	.65	.21	.022	1.36	.18
BFNE-II	.82**	.42	.110	3.02	<.01
OASES-SII	.35*	.30	.067	2.35	.03

\* $p < .05$ , \*\* $p < .01$

The data contained within Table 3.15 demonstrates that trait anxiety was the only significant predictor of stuttering severity (%SS) and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII) were significant predictors of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

#### *Environmental Factors*

In combination, the two environmental factors predictor variables accounted for a non-significant 11.0% of the variability in stuttering severity (%SS),  $R^2 = .110$ , adjusted  $R^2 = .056$ ,  $F(2,33) = 2.03$ ,  $p = .15$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered small ( $f^2 = .12$ ).

Collectively, the two environmental factors predictor variables accounted for a significant 58.7% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .587$ , adjusted  $R^2 = .562$ ,  $F(2,33) = 23.45$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = 1.42$ ).



Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 3.16.

Table 3.16: Results from MRA of Environmental Factors in AWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each environmental factor predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
SDQ	.18	.08	.006	.47	.65
OASES-SIII	.13	.30	.085	1.78	.09
<b>OASES-SI</b>					
SDQ	-.28	-.06	.003	-.47	.64
OASES-SIII	.77**	.78	.566	6.72	< .001

\* $p < .05$ , \*\* $p < .01$

The data displayed in Table 3.16 demonstrates that communication difficulty in daily situations (OASES-SIII) was the only significant predictor of self-awareness and knowledge of stuttering (OASES-SI) in the final regression model.

#### *Quality of Life*

The quality of life predictor variable accounted for a non-significant 9.5% of the variance in stuttering severity (%SS),  $R^2 = .095$ , adjusted  $R^2 = .068$ ,  $F(1,34) = 3.57$ ,  $p = 0.7$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered small ( $f^2 = .10$ ).

The quality of life predictor variable accounted for 29.0% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .290$ , adjusted  $R^2 = .270$ ,  $F(1,34) = 13.92$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .41$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for the predictor in the regression model are reported in Table 3.17.

Table 3.17: Results from MRA of Quality of Life in AWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for the quality of life predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
OASES-SIV	.12	.31	.095	1.89	.07
<b>OASES-SI</b>					
OASES-SIV	.47**	.54	.291	3.73	.001

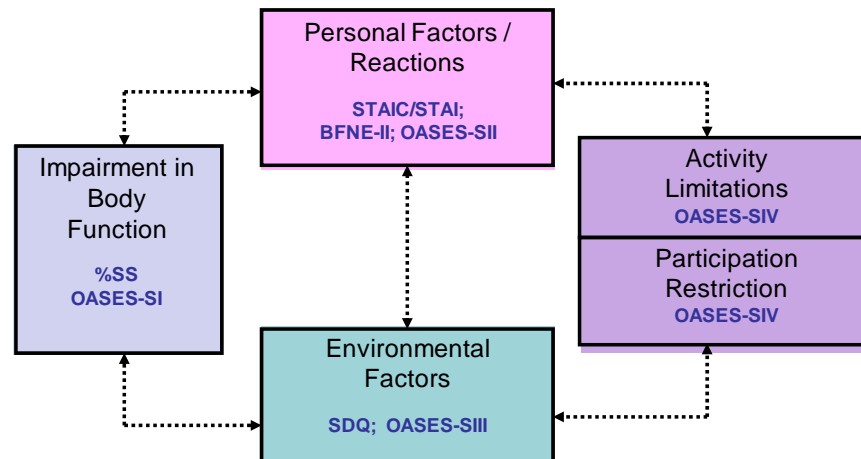
\* $p < .05$ , \*\* $p < .01$

As can be seen in Table 3.17, quality of life (OASES-SIV) was a significant predictor of OASES-SI in the final regression models.

Therefore, the Yaruss and Quesal (2004) model was designed to depict how the stuttering disorder could be viewed in terms of several interacting components. The results provided in this section in which multiple regression analyses were carried out confirm that several predictor psychosocial variables in children and adolescents who stutter contribute statistically significant unique variance to the *Impairment in Body Function* component (i.e., severity of stuttering as assessed by %SS and self-awareness and knowledge of stuttering as measured by OASES-SI).

### 3.3.6 Exploratory Factor Analysis

To investigate the underlying structure of the assessment and questionnaire data collected from children and adolescents who stutter in this study, which had been mapped onto each of the four biopsychosocial components of the model provided by Yaruss and Quesal (2004) (see Figure 3.4), principal component analysis with Oblimin rotation was used.



**Figure 3.4:** Biopsychosocial components of the Yaruss & Quesal (2004) model with psychosocial measures superimposed.

Prior to data entry we further sub-categorised the data obtained from the OASES questionnaire (see Appendix A) into each of the separate OASES questionnaire sub-categories (i.e., OASES-SIA, B and C; OASES-SIIA, B, and C; OASES-SIIIA, B, C, and D; and OASES-SIVA, B, C, D and E) in order to more distinctively explore the factor structure of the assessment and questionnaire data which had been mapped onto the four biopsychosocial components.

Prior to running the principal component analysis, the suitability of the data for factor analysis was assessed. Examination of the data indicated that not every variable was normally distributed. Given the robust nature of factor analysis, these deviations were not considered problematic. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Okin value was also

inspected to ensure that it exceeded the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix. In addition, an inspection of the screeplot was also carried to assist in our choice of final factors.

#### 3.3.6.1 Children Who Stutter

##### *Impairment in Body Function*

One factor (with Eigenvalues exceeding 1) was identified as underlying the measures which were used for the assessment of Impairment in Body Function (see Table 3.18). In total, this factor accounted for 58.44% of the variance in the assessment and questionnaire data.

##### *Personal Factors / Reactions*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the questionnaire measures which were used for the assessment of Personal Factors/ Reactions (see Table 3.18). In total, these factors accounted for 70.44% of the variance in the questionnaire data.

##### *Environmental Factors*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures which were used for the assessment of Environmental Factors (see Table 3.18). In total, this factor accounted for 60.17% of the variance in the questionnaire data.

##### *Quality of Life*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures which were used for the assessment of Quality of Life (see Table 3.18). In total, this factor accounted for 71.38% of the variance in the questionnaire data.

Table 3.18: Factor structure of the four biopsychosocial domains in Children ( $N = 39$ )

Measures	Loadings	
	Component 1	Component 2
<b>Impairment</b>	<b><i>“Impairment”</i></b>	
% SS	.65	
OASES-SIA	.77	
OASES-SIB	.77	
OASES-SIC	.87	
Percentage of Variance	58.44%	
<b>Personal</b>	<b><i>“Reactions”</i></b>	<b><i>“Anxiety”</i></b>
STAIC (state)	.16	.93
STAIC (trait)	.09	.91
BFNE-II	.65	.47
OASES-SIIA	.80	.09
OASES-SIIB	.79	.09
OASES-SIIB	.84	.06
Percentage of Variance	42.80%	27.64%
<b>Environmental</b>	<b><i>“Environmental”</i></b>	
SDQ	.55	
OASES-SIIIA	.93	
OASES-SIIIB	.69	
OASES-SIIIC	.87	
OASES-SIIID	.79	
Percentage of Variance	60.17%	
<b>Quality of Life</b>	<b><i>“Quality of Life”</i></b>	
OASES-SIVA	.86	
OASES-SIVB	.87	
OASES-SIVC	.84	
OASES-SIVD	.78	
OASES-SIVE	.88	
Percentage of Variance	71.38%	

### 3.3.6.2 Adolescents Who Stutter

#### *Impairment in Body Function*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measure which was used for the assessment of Impairment in Body Function (see Table 3.19). In total, this factor accounted for 54.91% of the variance in the assessment and questionnaire data.

#### *Personal Factors / Reactions*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the questionnaire measures which were used for the assessment of Personal Factors / Reactions (see Table 3.19). In total, this factor accounted for 66.90% of the variance in the questionnaire data.

#### *Environmental Factors*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the questionnaire measures which were used for the assessment of Environmental Factors (see Table 3.19). In total, these factors accounted for 75.65% of the variance in the questionnaire data.

#### *Quality of Life*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures which were used for the assessment of Quality of Life (see Table 3.19). In total, this factor accounted for 72.59% of the variance in the questionnaire data.

Table 3.19: Factor structure of the four biopsychosocial domains in Adolescents ( $N = 36$ )

Measures	Loadings	
	Component 1	Component 2
<b>Impairment</b>	<b><i>“Impairment”</i></b>	
% SS	.65	
OASES-SIA	.83	
OASES-SIB	.54	
OASES-SIC	.89	
Percentage of Variance	54.91%	
<b>Personal</b>	<b><i>“Anxiety”</i></b>	<b><i>“Reactions”</i></b>
STAI (state)	.88	.24
STAI (trait)	.89	.07
BFNE-II	.57	.48
OASES-SIIA	-.01	.94
OASES-SIIB	.33	.55
OASES-SIIB	.25	.70
Percentage of Variance	34.22%	32.69%
<b>Environmental</b>	<b><i>“Family &amp; Social”</i></b>	<b><i>“School”</i></b>
SDQ	.08	.90
OASES-SIIIA	.89	.43
OASES-SIIIB	.61	.75
OASES-SIIIC	.88	.15
OASES-SIIID	.74	.04
Percentage of Variance	53.80%	21.85%
<b>Quality of Life</b>	<b><i>“Quality of Life”</i></b>	
OASES-SIVA	.72	
OASES-SIVB	.95	
OASES-SIVC	.89	
OASES-SIVD	.82	
OASES-SIVE	.86	
Percentage of Variance	72.59%	

### **3.4 DISCUSSION**

This research has reinforced the need for a broader conceptualisation of stuttering to elucidate the psychosocial impact of the disorder. The results obtained in this study demonstrate statistically significant differences between impairment in body function (self-awareness of speaking ability), personal factors/reactions (state and trait anxiety, social anxiety and reactions to speaking ability), environmental factors (behaviour and social difficulties and communication difficulties in daily situations), and quality of life (activity limitations and participation restrictions) in children and adolescents who do and do not stutter.

Children and adolescents who stuttered reported clinically significant higher levels of impairment in body function; greater affective, behavioural and cognitive reactions to their speaking ability; greater impact of the environment on their speaking ability; and poorer quality of life compared to children and adolescents who did not stutter. These findings make an important contribution to the wider literature regarding the impact of the stuttering disorder on anxiety and psychosocial variables in children and adolescents, especially given the limited number of studies published in this area to date. In addition, the data supported and reinforced the Yaruss and Quesal (2004) model which depicted a framework in which the stuttering disorder could be viewed in terms of several interacting biopsychosocial components.

The following section discusses the theoretical and practical implications of these finding using the Yaruss and Quesal (2004) model components as a framework. Each component within the Yaruss and Quesal (2004) model (Impairment in Body Function, Personal Reactions/Factors, Environmental Factors, and Quality of Life) will be reviewed separately followed by a review of the various relationships and interactions between these biopsychosocial components.



### **3.4.1 Impairment in Body Function**

The stuttering speech severity and typographical characteristics of stutters represent a single layer of the stuttering disorder. This study chose to measure %SS (severity of stuttering) and self-awareness and knowledge of stuttering experience (OASES-SI) to reflect the children's and adolescent's impairment in body function component.

Children and adolescents who stuttered displayed a significant association between stuttering severity (%SS) and self-awareness and knowledge of their stuttering experience (OASES-SI). Interestingly, this finding demonstrates how children and adolescents with a higher severity of stuttering appear to possess more self-awareness and increased knowledge regarding their stuttered speech.

Parental reports have frequently indicated that children who stutter are aware of their stuttering shortly after its onset, which has the potential to affect social interaction from an early age (Ambrose & Yairi, 1994; Packman et al., 2003). Children who stutter as young as 3 and 4 years have been found to experience more negative attitudes towards speech than their fluent peers, and these attitudes appear to exacerbate with age and stuttering severity (De Nil & Brutton, 1990, 1991; Vanryckeghem, 1995; Vanryckeghem & Brutton, 1997; Vanryckeghem et al., 2001, 2005). Each child and adolescent assessed in this study had formerly been provided with speech pathology therapy but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore it is plausible that the children and adolescents who continue to stutter despite previous unsuccessful treatment develop a strong interactive relationship with self-awareness and knowledge of their stuttering experience.

The biopsychosocial perspective which has been taken within this thesis proposes that overt stuttering behaviours may not be the singular most important factor for people

who stutter (Manning, 2001; Shapiro, 1999; Yaruss et al., 2002; Yaruss & Quesal, 2004; 2006; 2008). Most individuals also experience a myriad of negative consequences associated with their speech disorder and these consequences can be described in terms of personal factors/reactions, environmental factors and quality of life.

### **3.4.2 Personal Factors / Reactions**

In this study the measures of state and trait anxiety (STAIC or STAI), social anxiety (BFNE-II) and reactions to stuttering/speaking ability (OASES-SII) were chosen to reflect personal factors and reactions which may be associated with stuttering.

#### **3.4.2.1 State and Trait Anxiety**

Young children (8-11 years of age) who stuttered displayed significantly higher state and trait anxiety than did control participants with these higher levels scoring above normal clinical limits. This finding is particularly noteworthy because it is inconsistent with the majority of previous research in children (Andrews & Harris, 1964; Craig and Hancock, 1996). Craig and Hancock (1996) found no differences in either state or trait anxiety between children who stuttered and age matched fluent peers, while Andrews and Harris (1964) found no differences between CWS and CWNS using a general anxiety scale for children.

Craig and Hancock (1996) compared 96 older children and adolescents who stutter aged 9-14 years with 104 age and education matched children and adolescents who do not stutter using the State-Trait Anxiety Inventory for Children (STAIC) (Spielberger et al., 1970) in an attempt to delineate the role of anxiety in the progression of stuttering. No significant difference was found between the two groups in either state or trait anxiety, yet differences in communication fears were observed, with older CWS found to be more apprehensive of and negative toward communicative

interactions (Craig & Hancock, 1996). The authors concluded that anxiety may be less common in CWS compared to adults who stutter. The authors inferred that heightened trait anxiety may not be a latent characteristic of children who stutter, but rather, may develop as a result of an accumulation of actual and perceived negative social communicative experiences (Craig & Hancock, 1996; Craig & Tran, 2005; Ginsberg, 2000).

Adolescents (12 – 17 years of age) who stuttered in this current study displayed significantly higher state and trait anxiety than control participants, with these higher levels scoring above normal clinical limits. These findings again demonstrate some interesting inconsistencies yet similarities as well with previous research (Blood et al., 2007; Craig and Hancock, 1996; Davis et al., 2007; Mulcahy et al., 2008). Craig and Hancock (1996) found no significant differences in either state or trait anxiety between adolescents who stutter and age matched fluent peers. Blood et al. (2007) administered the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 2002) to 36 AWS and 36 AWNS aged 12 to 18 years and found that AWS, although generally evidencing higher levels of generalised anxiety than their fluent peers, still scored within normal limits. Davis et al. (2007) examined state and trait anxiety in AWS with the results suggesting that AWS have higher state anxiety than AWNS, however they found no differences in trait anxiety between AWS, adolescents who had recovered from stuttering, and AWNS aged between 10 and 17 years. Mulcahy et al. (2008), examined state and trait anxiety in AWS with results suggesting that AWS have higher state and trait anxiety than do AWNS, however the higher levels still scored within normal clinical limits.

The polarised results of these studies (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety in people who stutter may in fact be age-dependent. More specifically, the suggestion is

made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering, state and trait anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004).

The significant differences between the results obtained within this study and the results of other researchers may lie in the population of children and adolescents who stutter who were assessed in this study. As described previously, these children and adolescents were referred by clinicians and parents to an innovative specialised holistic biopsychosocial program specifically run by the Curtin University Stuttering Treatment Clinic. This is a centre offering specialised clinical expertise and is respected as a second opinion clinic for previously unsuccessful treatments. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success.

Craig (1990) found that adults who stuttered experienced state anxiety specific to speaking situations prior to treatment, as well as overall higher levels of trait anxiety than adults who did not stutter, regardless of whether they had had treatment or not. Further, Craig et al. (2003) found higher levels of generalised anxiety in severely affected adults who stutter and who had previously been involved in or who were currently receiving treatment. Children and adolescents in this study had previously been enrolled in speech pathology treatment for their stuttering and they were awaiting

this specialised biopsychosocial group therapeutic program. Hence, these results allowed for clear examination of anxiety in the clinical population of children and adolescents who stutter who need and are awaiting therapeutic assistance. An accurate examination of previous treatment-related factors in individuals who stutter (such as type, length and frequency) should be considered in future research to account for possible treatment impact effects and to allow for more precise examination of such effects.

The findings in this study, obtained during both the childhood and adolescent time frame, contribute to an important developmental period for individuals who stutter in relation to the findings of trait anxiety. For these individuals, it has been suggested that trait anxiety is a permanent personality characteristic (Endler et al., 1991). Craig and Hancock (1996) did not report state or trait anxiety differences between children and adolescents who stuttered (aged 9-14 years) relative to control participants, however it has been reported that adults who stutter do exhibit such differences (Craig et al., 2003). Trait anxiety may therefore be unstable, evolving or age-dependent in individuals who stutter, and perhaps it is the experience of being chronically negatively evaluated that contributes to this serious phenomenon (current study; Davis et al., 2007; Messenger et al., 2004; Mulcahy et al., 2008).

#### 3.4.2.2 Social Anxiety

Children and adolescents who stuttered displayed significantly higher social anxiety than did control participants with these higher levels scoring above normal clinical limits. There are limited studies in the literature which have looked at social anxiety or fear of negative evaluation. Menzies et al. (1999) have suggested that it is necessary to include measures of expectancy of harm in studies attempting to evaluate the role of anxiety in individuals who stutter. However, in contrast, the results from this

current study suggest that social anxiety, or the fear of being negatively evaluated, does not contribute uniquely to the profile of children and adolescents who stutter. Social anxiety correlates significantly with state anxiety measures in children and state and trait anxiety measures in adolescents. Thus, these results are inconsistent with the argument that social anxiety may be a more focussed way of measuring anxiety in children and adolescents who stutter (as opposed to traditional state and trait anxiety measures) and further suggest that an interaction between different components of anxiety is a more helpful way of viewing the relationships (Endler et al., 1991).

Mulcahy and colleagues (2008), investigated adolescents and found statistically significant higher scores reported on the Fear of Negative Evaluation (FNE) scale compared to fluent peers, although the scores were still classified within normal clinical limits. In addition, although the researchers reported a significant correlation between FNE and trait anxiety, there was no significant correlation between the FNE and state anxiety. The authors proposed that this lack of significant correlation between FNE and state anxiety may have been related to the sensitivity of the FNE scale used. In the current study, the BFNE-II (Carleton et al., 2006) was used which is a modified version of the FNE scale and comprises 12 worded in a clear manner using a 5 point Likert-scale providing a greater range of responses. By contrast, the FNE scale used in the Mulcahy et al. (2008) study, asked participants to respond using a binary true/false response. This may not have been as sensitive in detecting similar differences and relationships in adolescents given the nature of the FNE scale used. In the Mulcahy et al. (2008) study the authors called for the use of the Likert-scale version of the BFNE-II in future research which is indeed what was used in this current study.

The clinical significance of the results collectively suggests that children and adolescents who stutter may be at risk of developing higher levels of anxiety than their fluent peers and that these levels of anxiety may be in the clinical range in some

instances. The finding that children and adolescents who stutter have higher levels of state, trait and social anxiety than their fluent peers has important implications when the developmental path of these anxieties is considered. If the results of this study in children and adolescents are found to be robust in even younger children, it would be incautious to assume that anxiety and a fear of being negatively evaluated only applies to chronic stuttering (Messenger et al., 2004).

Longitudinal research examining the trajectory of anxiety across the lifespan of the individual who stutters may be useful in further identifying the role of anxiety in the stuttering disorder, including whether anxiety develops on a parallel course or increases with an expanding trajectory with stuttering behaviour.

#### 3.4.2.3 Reactions to Stuttering / Speaking Ability

Children and adolescents who stutter displayed significantly higher reactions to their stuttering/speaking ability (OASES-SII) than did control participants with an impact rating of moderate-to-severe in CWS. There are currently no published studies which have used the complete OASES questionnaire for both children and adolescents who stutter and children and adolescents who do not stutter as comparison groups.

The results obtained in this study support the premise that CWS and AWS are experiencing more statistically significant affective, behavioural and cognitive distress and reactions concerning their speaking abilities. It has been noted in the literature that CWS and AWS may experience a variety of emotional reactions to their stuttering (e.g., Cooper, 1993; DeNil & Brutten, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutten, 1996; 1997; Watson, 1988; Yaruss, 1998; Yaruss & Quesal, 2004, 2006) and the current study endorses this claim. Further, in this study, these emotional reactions appear to pose particular challenges for CWS and AWS and they do not appear to possess the necessary coping

skills for managing these strong emotions. When the CWS and AWS were referred to the Curtin University Stuttering Treatment Clinic group program, it was often the emotional distress experienced by the CWS and AWS which was the major catalyst behind the appeal for inclusion. This referral is not surprising as the affective, behavioural and cognitive reactions to their speaking ability were assessed in the above clinical limits compared to their fluent peers.

It has also been reported clinically and documented within the literature that those individuals who stutter exhibit behavioural reactions to stuttering including physical tension and struggle as they force their way through moments of stuttered speech (e.g., Johnson, 1961; Van Riper, 1982; Wingate, 2002). In addition, speaking avoidance and escape behaviours are noteworthy (Plexico, Manning, & Levitt, 2009). Such behaviours constitute the child or adolescent's attempts to minimise exposure to difficult speaking situations such as reading aloud in front of an audience or demonstrating public requests for information. Although these avoidance behaviours may minimise stuttering in the short-term, the child or adolescent who continues to avoid speaking situations is limited in participating in key activities that are important for educational or social development (Murphy, Quesal, & Gulker, 2007). The statistically significant higher behavioural reactions documented in this study pose challenges to these CWS and AWS and need to be addressed as a clinical priority.

Researchers have documented negative cognitive reactions for these young people including low self-esteem, diminished self-confidence, and reduced feelings of self-efficacy (Blood & Blood, 2004; Healey & Scott, 1995; Manning, 2001; Ramig & Bennett, 1995; 1997; Ramig & Dodge, 2005; Reardon-Reeves & Yaruss, 2004; Starkweather & Givens-Ackerman, 1997; Vanryckeghem et al., 2005; Yaruss, 1998; Yaruss & Quesal, 2004; 2006). Children and adolescents who stutter spend a considerable amount of time worrying about stuttering and wondering about listeners



perceptions. They report diminished self-esteem and low self-confidence which impacts on social discourse and interpersonal interactions. The results from this study reinforce the premise that CWS and AWS have statistically significant higher cognitive reactions than do their fluent peers. In short, they are working so much harder at the fundamental right a young person needs to be fluent,

### **3.4.3 Environmental Factors**

In this study the measures of behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII) were chosen to reflect environmental factor which may be associated with stuttering.

#### **3.4.3.1 Behavioural and Social Difficulties**

Children and adolescents who stuttered displayed significantly higher behavioural and social problems than their fluent peers. The SDQ is designed to measure child psychopathology along various constructs including emotional symptoms, conduct and peer problems (Achenbach et al., 2008). As the SDQ relates to overall behavioural and social difficulties, and is not specific to stuttering, it is highly likely the development and presence of stuttering further exacerbates these inherently vulnerable qualities in the children and adolescents. This view is supported by previous research that indicates across the developmental span, preschoolers, adolescents and adults who stutter possess traits that differentiate them from the fluent population. People who stutter have been found to be more socially anxious, sensitive and insecure, possess poorer attention, and experience lower emotional regulation than the general population (Anderson, Pellowski, Conture, & Kelly, 2003; Blood et al., 2001; Fowlie & Cooper, 1978; Karass et al., 2006; Mulcahy et al., 2008).

Fowlie and Cooper (1978) required mothers of 6- to 11-year-old children who stuttered and mothers of fluent peers to rate their children on a checklist of personality

traits that had previously been selected by speech clinicians as typical of individuals who stutter. The children who stuttered were perceived by their mothers as more insecure, sensitive, anxious, withdrawn, fearful, and introverted than were the fluent peers. Karrass et al. (2006) surveyed parents of 65 preschool children who stutter with a matched cohort. Children who stuttered were rated as significantly more reactive, less able to regulate their emotions, and less able to regulate their attention.

The results presented in the current study further supports and underpin the premise that CWS and AWS experience more difficulties compared to their fluent peers in their school, social and home environments and support the notion that stuttering is more than just its surface behaviours. While speech disfluency is an essential feature, this stuttering disorder is intertwined with other domains including psychosocial, emotional and environmental factors (Karass et al., 2006; Yairi, 2007). The results thus far support the argument for the adoption of a broader conceptualisation of stuttering when considering the assessment and treatment in children and adolescents.

#### 3.4.3.2 Communication in Daily Situations (OASES-SIII)

Children and adolescents who stuttered displayed significantly higher difficulties in communicating in daily situations than their fluent peers. It has been posited that difficulties in communicating in daily situations may be the result of conditioning that occurs when a neutral communication situation is associated with negative and aversive consequences (Daly, McCroskey, Ayres, Hopf & Ayres, 1997). Given the negative evaluation that has been associated with stuttering over time, it is not surprising that results from this current study reported children and adolescents who stuttered to experience greater difficulties with communication in daily situations, especially if the experience of the child or adolescent has been that previous treatment for the stuttering disorder has been unsuccessful.

The results from this study reinforce the need for treatment program which are designed for children and adolescent and incorporate strategies and techniques to assist these young people with their communication difficulties in daily situations. The use of task and situational hierarchies and generalisation plans within treatment programs ensure that speakers can use techniques across a variety of situations (Brutten & Shoemaker, 1967; 1974; Darley & Spriestersbach, 1978; Shumak, 1955; see also Hillis & McHugh, 1998; Ingham & Onslow, 1987). Such hierarchies embrace universal principals of learning, and are used to assist the child or adolescent to achieve mastery of new behaviours and generalise these behaviours into beyond clinic speaking situations. The use of hierarchies in the ‘Smooth Speech and Cognitive Behavior Therapy’ and ‘Comprehensive Treatment’ programs detailed in Chapter 1 of this thesis were structured and were used both in the initial learning of complex behaviours and in the systematic generalisation of these behaviours to everyday real-life situations. The premise behind this multi-disciplinary holistic approach to treatment is to not only effectively assist children and adolescents who stutter improve their fluency, but also to reduce the negative impact that this stuttering disorder has on their communication in daily activities and participation in life.

#### **3.4.4 Quality of Life (OASES-SIV)**

In this study the impact of stuttering on the child or adolescent’s quality of life was measured by OASES-SIV.

Children and adolescents who stuttered displayed significantly lower quality of life responses than their fluent peers. While it has been noted by researchers that quality of life is a potentially important measure when assessing the impact of stuttering (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), quality of life research assessing the impact of stuttering in adults who stutter has only recently been

undertaken (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Franic & Bothe, 2008; Craig et al., 2009) and there is very limited literature assessing the impact of stuttering on quality of life in children and adolescents.

Craig et al. (2009) in adults who stutter reported that stuttering does have a negative impact on quality of life in the domains of vitality, social functioning, emotional functioning and mental health status. In addition, results from this study suggested that adults who stutter who have an increased level of stuttering severity may have a higher risk of poor emotional functioning. The authors stated that these findings had important therapeutic implications for the treatment of children who stutter. Based on the assumption that the negative impact of stuttering on quality of life may be the consequence of chronic stuttering over time (Bloodstein & Bernstein Ratner, 2008), the authors stated that it was imperative that treatments for children and adolescents improve so that fewer children and adolescents who grow up into adults still stutter at elevated or severe levels (Craig et al., 2009).

It is evident from the results presented thus far that stuttering can affect the emotional, behavioural and cognitive reactions to communicating in daily living situations negatively. Children and adolescents in particular have experienced negative reactions in the form of school yard bullying and teasing (Blood & Blood, 2004; Davis et al., 2002; Langevin, 1997, 2000; Langevin et al., 1998; Murphy & Quesal, 2002; Murphy, Yaruss. & Quesal, 2007a, 2007b; Yaruss et al., 2004). Such life frustrations, may impact upon the young person's full participation in educational and recreational opportunities. At such a formative time in their social and emotional development coupled with the need to interface with society at large, these young people are suffering and the resultant impact on their quality of life appears to have evolved.

It has been emphasised in other sections of this thesis that the significant differences between the results obtained within this study and the results of other

researchers may lie in the population of children and adolescents who stutter who were assessed in this study. These children and adolescents were referred by clinicians and parents to the Curtin University Stuttering Treatment Clinic. This is a centre offering specialised clinical expertise and is respected as a second opinion clinic for previously unsuccessful treatments. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore it may be plausible that the level of impact on each of the psychosocial variables discussed so far may in part be a reflection of this particular cohort of children and adolescents seeking assistance.

In the previous section of this discussion, the impact of the stuttering disorder on separate component within the Yaruss and Quesal (2004) model has been reviewed and discussed. The next section of this discussion will review and evaluate the various relationships and interactions between the measured biopsychosocial variables within each model component that have been studied in children and adolescents who stutter.

### **3.4.5 Impairment in Body Function and Personal Factors/Reactions**

In this study, impairment in body function was measured by severity of stuttering %SS, self-awareness and knowledge of stuttering experience (OASES-SI) and personal factors/reactions was measured by state and trait anxiety (STAIC or STAI), social anxiety (BFNE-II) and reactions to stuttering (OASES-SII).

#### **3.4.5.1 Relationship between State and Trait Anxiety and %SS**

In addition to the finding that children and adolescents who stuttered had significantly higher state and trait anxiety than their fluent peers, the findings from this study support the premise that anxiety may play a interactional or mediating role in

exacerbating stuttering behaviours (as suggested by Conture et al., 2006; Messenger et al., 2004; Davis et al., 2007). Several key anxiety measures in children and adolescents showed a significant correlation with the severity of their stuttering. In the CWS, severity of stuttering was positively correlated with trait anxiety and in AWS, severity of stuttering was positively correlated with both state and trait anxiety. This is new and significant research information that has not been demonstrated in the literature for children and adolescents who stutter to date.

If anxiety is an aetiological contributor to developmental stuttering, it would be assumed that greater anxiety would engage more severe stuttering. In fact, in children, state anxiety has been found to be associated with greater risk of stuttering (Weiss & Zebrowski, 1992). The results from this study which demonstrate a positive association with stuttering severity may support such a postulated relationship. In addition, the mean scores for the group of children and adolescents who stuttered were in the clinical range for each of these anxiety measures further suggesting that these anxiety levels can be classified as impacting significantly on normal functioning (Spielberger, 1973; 1983; Watson & Friend, 1969) and therefore in all probability contributing to an increase in the severity of stuttering.

As discussed previously, synthesis of the results obtained by researchers in adults who stutter (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait may be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering,

state and trait anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004). The results from this study support this assertion.

#### 3.4.5.2 Relationship between State and Trait Anxiety and OASES-SI

In CWS, state and trait anxiety were demonstrated to be independent of self-awareness of stuttering (OASES-SI) through statistical correlation and regression analyses. By contrast, in AWS, both state and trait anxiety was positively correlated to self-awareness of stuttering (OASES-SI) and trait anxiety was a significant predictor of self-awareness of stuttering in the regression analyses results.

It has been demonstrate that the children and adolescents assessed in this study have statistically significant higher state and trait anxiety than their fluent peers with these higher levels scoring above normal clinical limits. Adolescents who continue to stutter despite previous treatment also appear to develop an increased self-awareness of their stuttering which is related to elevated state and trait anxiety. It may be that an increase in the development of self-awareness of stuttering occurs during the time span between childhood and adolescents which in turn may exacerbate both state and trait anxiety levels. Adolescents appear to become increasingly aware of negative listener reactions and their desire to hide stuttering increases as they experience repeated communication failures during peer interactions (Dell, 2000). The need to feel accepted by peers and to develop an association with peer groups becomes an essential issue for older children. The current results obtained during childhood and adolescence contributes to an important developmental period for individuals who stutter, especially with regards to knowledge and self-awareness of stuttering and its relationship to state and trait anxiety.

#### 3.4.5.3 Relationship between Social Anxiety and %SS

Children and adolescents who stuttered demonstrated significantly higher social anxiety compared to their fluent peers however social anxiety scores were independent of severity of stuttering in correlation and regression analyses. This result does not lend support to the proposal that social anxiety plays a interactional or mediating role in exacerbating stuttering behaviours (as suggested by Conture et al., 2006; Messenger et al., 2004; Davis et al., 2007). These results imply that rather than social anxiety playing a mediating role, it may in fact be a by-product of the complete stuttering disorder.

Children and adolescents who have been stuttering for some time develop advanced techniques to cope with and conceal their disorder (Floyd et al., 2007). In this current study, it is possible that severity was not transparent because strategies used to facilitate fluency (such as word avoidance and circumlocution) concealed a true representation of conversational speech. Individuals in an anxious state frequently worry about threat and try to develop effective strategies to reduce anxiety to achieve their goal (Eysenck et al., 2007; Plexico et al., 2009). It is possible that speech-related anxiety suppressed a true representation of stuttering surface features. Further research could examine the associations between disclosure of avoidant behaviours and strategies, personality attributes and stuttering surface behaviours in children and adolescents who stutter.

#### 3.4.5.4 Relationship between Social Anxiety and OASES-SI

In CWS and AWS, social anxiety was shown to be positively related with self-awareness of stuttering through correlation and regression analyses results.

The children and adolescents in this study have been shown to have significantly higher social anxiety than fluent peers with these higher levels scoring above normal clinical limits. Children and adolescents who continue to stutter despite previous



treatment appear to develop an increased self-awareness of their stuttering which is related to an increased anxiety in social situations. Children and adolescents who stutter appear to have heightened differences in communication skills resulting in more sensitivity to negative listener reactions. The need to feel accepted by peers and to develop an association with peer groups is an essential issue for children and adolescents who may feel alienated because of stuttering. Such young people may become more socially anxious as they experience repeated communication failures during peer interactions (Dell, 2000). The current results obtained during childhood and adolescence contributes knowledge about self-awareness of stuttering and its relationship to social anxiety.

This result is also an indication that when measuring the ‘Impairment in Body Function’ components of the stuttering disorder, different assessments within the biopsychosocial components may disclose different but important perspectives with respect to the impact of the stuttering disorder. This reinforces the proposal that a broader conceptualisation of the stuttering disorder is needed in assessment and treatment.

#### 3.4.5.5 Relationship between Reactions to Speaking Ability and %SS

In both children and adolescents who stuttered, a significant positive relationship between reactions to stuttering and severity of stuttering was demonstrated in correlations analyses. Only the CWS demonstrated a positive relationship in the regression analyses which established the reactions to stuttering (OASES-SII) as a predictor of severity of stuttering. This result has previously not been demonstrated in the literature for children and adolescents who stutter.

The children and adolescents in this study who continued to stutter despite previous unsuccessful treatment appear to have developed negative affective,

behavioural and cognitive reactions to their stuttering compared to their fluent peers which is consistent with what is proposed by other researchers (e.g., Yaruss, 1998; Cooper, 1993; DeNil & Brutten, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutten, 1996; 1997; Watson, 1988; Yaruss & Quesal, 2004, 2006). The affective reactions in this study included feelings of anger, sadness, fear, anxiety, shame, and embarrassment. The behavioural reactions included experiential avoidance, physical tension, word avoidance and circumlocution. The cognitive reactions included negative evaluations of their communication abilities, cognitive fusion, and self-criticism.

This finding reinforces the premise of the Yaruss and Quesal (2004) model that feelings, behaviours and thoughts are impacted by the stuttered severity and this inter-relationship develops and strengthens progressively over the life-span. Therapeutically, it follows that the incorporation of strategies to manage these personal reactions is a necessary part of a holistic approach to stuttering therapy.

#### 3.4.5.6 Relationship between Reactions to Speaking Ability and OASES-SI

In both children and adolescents who stuttered, a significant positive relationship was demonstrated between reactions to stuttering and self-awareness of stuttering through correlation and regression analyses. This result has not been previously reported.

The children and adolescents in this study who continue to stutter despite previous unsuccessful treatment and are aware of their stuttering behaviour also experience negative affective, behavioural and cognitive reactions to their stuttering. As the CWS and AWS become aware of the differences between their communication skills and the communication skills of their fluent peers, amplification of their affective, behavioural and cognitive reactions may occur. The development of self-awareness which occurs in

this developmental time frame may contribute to an increased awareness of the negative listener reactions. The desire to conceal stuttering increases as these children experience repeated communication failures during peer interactions (Dell, 2000). The need to feel accepted by peers and to develop an association with peer groups becomes an essential issue for older children who may feel socially ostracised.

The results in this study poignantly highlight that children and adolescents who continue to stutter despite previous unsuccessful treatment appear to develop a self-awareness of their stuttering experience which in turn has a strong relationship with negative affective, behavioural and cognitive reactions.

### **3.4.6 Impairment in Body Function and Environmental Factors**

In this study impairment in body function was measured by severity of stuttering (%SS) and self-awareness and knowledge of stuttering experience (OASES-SI) and environmental factors were measured by behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII).

#### **3.4.6.1 Relationship between Behavioural and Social Difficulties and %SS**

Interestingly, the findings supported a significant positive relationship between behavioural and social difficulties and severity of stuttering in CWS. There was no such relationship in AWS between behavioural and social difficulties and severity of stuttering. Again, the unique results have not been demonstrated in the literature for children and adolescents who stutter.

In contrast to younger children, the adolescents in this study did not exhibit a significant relationship between behavioural and social difficulties and severity of stuttering. This may be due to adolescents engaging in more covert and innovative sublimating behaviours and social strategies in order to facilitate fluency or decrease the

assessed severity of their stuttering. Adults who stutter consistently use word avoidance and circumlocution to manage their conversational speech and teenagers may also restrict communication situations and engage in social isolation (Plexico et al., 2009)

Previous research indicates that across the developmental span, preschoolers, adolescents and adults who stutter possess traits that differentiate them from the fluent population. People who stutter have been found to be more socially anxious, sensitive and insecure, possess poorer attention, and experience lower emotional regulation than the general population (Anderson, Pellowski, Conture, & Kelly, 2003; Blood et al., 2001; Fowle & Cooper, 1978; Karass et al., 2006; Mulcahy et al., 2008).

The results presented in the current study further supports and underpin the premise that CWS and AWS experience more difficulties compared to their fluent peers in their school, social and home environments and support the notion that stuttering is more than just its surface behaviours. While speech disfluency is an essential feature, this stuttering disorder is intertwined with other domains including psychosocial, emotional and environmental factors (Karass et al., 2006; Yairi, 2007). The results thus far support the argument for the adoption of a broader conceptualisation of stuttering when considering the assessment and treatment in children and adolescents.

#### 3.4.6.2 Relationship between Behavioural & Social Difficulties & OASES-SI

Comparable to the findings between behavioural and social difficulties and stuttered severity, a significant positive relationship between behavioural and social difficulties and knowledge and self-awareness of stuttering was also demonstrated in children who stutter but not adolescents who stutter.

In a related process, it is highly probable that the development and presence of stuttering in CWS, which was resistant to previous treatment, has enhanced their self-awareness of their stuttering and this awareness has further exacerbated or maintained

these inherently vulnerable behavioural and social qualities. In contrast, the adolescents in this study did not appear to exhibit a significant relationship between self-awareness and behavioural and social difficulties. Again, this may be due to adolescents engaging in more covert and innovative sublimating behaviours and social strategies in order to facilitate fluency or decrease the assessed severity of their stuttering

Therefore, the clinical implications of assisting the CWS and AWS with learning techniques and coping strategies which empower them in tackling their stuttering disorder beyond the stuttering surface features provides direct clinical directions for intervention needs.

#### 3.4.6.3 Relationship between Communication in Daily Situations and %SS

In children who stutter, a significant positive correlation between difficulties in daily communication and severity of stuttering was demonstrated whereas no such relationship was demonstrated in adolescents who stutter.

Inevitably, if a person encounters persistent difficulty in communicating in daily situations the negative evaluation that occurs over time becomes conditioned. It has been proposed that the effects of stuttering often increase as children reach the early adolescent years. Peer pressure and acceptance to conform become major factors in the social life of the adolescent students and teasing and bullying often peak at this time (Blood & Blood, 2004; Davis et al., 2002; Langevin, 1997, 2000; Langevin et al., 1998; Murphy & Quesal, 2002; Murphy, Yaruss. & Quesal, 2007a, 2007b; Yaruss et al., 2004). Clinically, it is common for the inappropriate actions of others to be the catalyst for an adolescent who is experiencing difficulty communicating effectively to seek therapeutic assistance. Adolescence who stutters initially attempts to respond to these pressures through avoidance, denial, and undesirable coping strategies which become further refined and sophisticated until these unhelpful coping strategies becomes less

efficient and the adolescent reaches crisis point. The conversion of these passive coping strategies into more active functioning coping strategies should provide useful clinical targets for group treatments as well as practical strategies and goals for generalisation tasks. These findings need to drive clinical goals for intervention for these young people.

#### 3.4.6.4 Relationship between Communication Difficulties & OASES-SI

A significant positive relationship between difficulties in daily communication and self-awareness of stuttering was demonstrated through correlation and regression analyses. This relationship highlights how enhanced personal insights into the experience of stuttering may evolve into passive coping strategies including the limitation and restriction of verbal output. Such a relationship has not been demonstrated in the literature for children and adolescents who stutter before although supports does exist for the premise that adults who stutter consistently use word avoidance and circumlocution to manage their conversational speech (Plexico et al., 2009).

These findings support the position that self-awareness and insight in children and adolescents who stutter can be used as a possible clinical agent. The self-awareness of the children and adolescents who stutter can be supported and supplemented through self-empowerment techniques to have a positive impact on the communication difficulties that they are experiencing in various speaking environments that they have previously avoided.

#### 3.4.7 Impairment in Body Function and Quality of Life

In this study impairment in body function was measured by severity of stuttering (%SS) and self-awareness and knowledge of stuttering experience (OASES-SI) and the

impact of stuttering on the child or adolescent's quality of life was measured by OASES-SIV.

#### 3.4.7.1 Relationship between Quality of Life and %SS

Children and adolescents who stuttered displayed significantly reduced quality of life than their fluent peers. In CWS but not AWS, a significant positive relationship was demonstrated between reduced quality of life and severity of stuttering through correlation and regression analysis.

While it has been noted by researchers that quality of life is a potentially important measure when assessing the impact of stuttering (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), quality of life research assessing the impact of stuttering in children and adolescents is limited. It has been reported by researchers investigating the impact of the stuttering disorder on quality of life in adults who stutter that these findings have important therapeutic implications for the treatment of children who stutter. The authors stated that it was vital that treatments for children and adolescents improve and incorporate a more holistic therapeutic approach to reduce the likelihood of these children and adolescents growing up into adults who still stutter at elevated or severe levels (Craig et al., 2009).

This result in adolescents who stutter reinforces the premise that the impact that stuttering can have on an individual is often much more than the surface characteristics, and it is apparent during adolescents that this relationship is much more complex and needs to serve as a treatment focus for intervention.

#### 3.4.7.2 Relationship between Quality of Life and OASES-SI

In CWS and AWS, a significant positive relationship between reduced quality of life and self-awareness of stuttering was demonstrated through correlation and

regression analyses. This finding posits that quality of life may be adversely affected by self-awareness of weaknesses in speaking abilities in children and adolescents who stutter. For the young people in this study, the contrast with their fluent peers in life enjoyment and expectancy is clearly demonstrated.

It is evident from the results that at such a formative time in their social and emotional development coupled with the need to interface with society at large, these young people are suffering and the resultant impact on their quality of life appears to have evolved.

### **3.4.8 Personal Factors/Reactions and Environmental Factors**

In this study the measures of state and trait anxiety (STAIC or STAI), social anxiety (BFNE-II) and reactions to stuttering (OASES-SII) were chosen to reflect personal factors and reactions and measures of behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII) were chosen to reflect environmental factors.

#### **3.4.8.1 State and Trait Anxiety and Behavioural and Social Difficulties**

Although CWS and AWS displayed significantly higher and clinical levels of state and trait anxiety and behavioural and social difficulties than fluent peers, the state and trait anxiety levels were independent of the behaviour and social difficulties.

This independent relationship between the state and trait anxiety scores and the behaviour and social difficulties scores demonstrate that the assessments of personal and environmental impact factors may reflect separate multi-factorial components of the children and adolescent stuttering experiences. This finding reinforces the premise that the impact of stuttering on the child or adolescent encompasses much more than the surface characteristics, and it is by its very nature, multi-dimensional with each component requiring separate and meticulous investigation. The individual components



then combined as a collective focus for intervention. The Yaruss and Quesal (2004) therapeutic model proposes that the various biopsychosocial components interact depending on the unique clinical characteristics of the child or adolescent who presents for therapy and this model provides an ideal foundation and framework for the development of a comprehensive treatment program.

#### 3.4.8.2 Social Anxiety and Behavioural and Social Difficulties

In CWS and AWS, a significant positive relationship between social anxiety and behavioural and social difficulties was demonstrated. This result has previously not been demonstrated in the literature for children and adolescents who stutter to date using these particular questionnaire measurements.

This relationship between social anxiety and behaviour and social difficulties reflects tumultuous times in the lifespan of childhood and adolescents which is made more difficult given the clinical social anxiety levels experienced by the young people who stuttered in this study. The significant relationships between these psychosocial variables reinforce the need for anxiety reducing, confidence enhancing and social life skills therapies when treating children and adolescents who stutter. Such interventions would address functional communication limitations and empower the children and adolescents through improved confidence and social skills. Although the specific content and success of such treatments are yet to be identified, the findings from this study suggest that a biopsychosocial approach to intervention would be most effective.

#### 3.4.8.3 Reactions to Speaking Ability and Behavioural and Social Difficulties

Although the reactions to speaking ability and behavioural and social difficulties were elevated related to their fluent peers, in both CWS and AWS, the reactions to speaking abilities were independent of behaviour and social difficulties. As such,

investigation beyond the exclusive focus on fluency is deemed essential for integrated life skills.

These results provide further support for the proposal that personal and environmental impact factors may reflect separate multi-factorial components of the children and adolescent stuttering experiences. Once more these findings constitute reinforcement for the premise that the impact of stuttering on the child or adolescent goes beyond surface characteristics. The results in this study poignantly highlight that children and adolescents who continue to stutter despite previous unsuccessful treatment develop limited passive coping strategies which assist them to navigate the tumultuous stuttering experience.

#### 3.4.8.4 State and Trait Anxiety and Communication Difficulties

In children who stutter, state anxiety was statistically significantly and positively related with communication difficulties with this relationship representing a measure of future mental health and the general impact that stuttering is having on these young, vulnerable people.

In adolescents who stutter, state and trait anxiety were statistically significantly and positively correlated with communication difficulties. The impact of both state and trait anxiety is clearly established for these adolescents who stutter in this study.

Considering the results of this study, and those of Mulcahy et al. (2008), who also demonstrated a statistically significant relationships between trait anxiety and communication difficulties in adolescents who stutter, it is possible to conclude that trait anxiety plays a particularly significant developmental role in stuttering. This positive correlation between trait anxiety and communication difficulties, which was not found in children who stutter, supports an association between communication difficulties and intrinsic anxiety levels amongst adolescents who stutter. Previous clinical researchers have demonstrated in adults who stutter that trait anxiety is significantly elevated

compared to their fluent peers (Craig et al., 2003). Therefore, these findings may suggest a delineated longitudinal timeframe for the nature of this relationship between trait anxiety and communication difficulties.

A common consensus of results of previous studies investigating anxiety and stuttering (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety in people who stutter may in fact be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering and anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004).

#### 3.4.8.5 Social Anxiety and Communication Difficulties in Daily Situations

In children and adolescents who stutter, the association between social anxiety and communication difficulties was confirmed by the finding that social anxiety (BFNE-II) was statistically significantly and positively correlated with a poorer communication attitude amongst the children and adolescents who stuttered.

A negative attitude to communication is thought to perpetuate social anxiety (Blood et al., 2001; Davis et al., 2007; Kraaimaat et al., 2002; Messenger et al., 2004). It has been posited that a poorer attitude to communication may be the result of conditioning that occurs when neutral communication activity is associated with negative and aversive consequences (Daly et al., 1997). Given the negative evaluation

that has been associated with stuttering over time, it is not surprising that results from this current study indicate that children and adolescents who stuttered reported higher levels of social anxiety and a poorer attitude to communication in everyday natural situations.

#### 3.4.8.6 Reactions to Speaking Ability and Daily Communication Situations

In children and adolescents who stutter, a strong positive relationship was demonstrated between reactions to speaking ability and difficulties in communication situations. These results support the premise that children and adolescents who stutter are experiencing more affective, behavioural and cognitive distress concerning their speaking ability. Further, in this study, these personal reactions pose particular challenges for CWS and AWS as these young people do not appear to possess the necessary functional coping skills for managing such strong affective, behavioural and cognitive reactions. As stated previously, when the CWS and AWS were referred to the Curtin University Stuttering Treatment Clinic group program, it was often the emotional and cognitive distress experienced by the CWS and AWS which was the major catalyst behind the appeal for inclusion. In addition, the affective, behavioural and cognitive reactions to their speaking ability have been assessed in the clinical range compared to their fluent peers.

#### 3.4.9 Personal Factors/Reactions and Quality of Life

In this study the measures of state and trait anxiety (STAIC or STAI), social anxiety (BFNE-II) and reactions to stuttering (OASES-SII) were chosen to reflect personal factors and reactions and the OASES-SIV was chosen to reflect quality of life.

#### 3.4.9.1 State and Trait Anxiety and Quality of Life

In children and adolescents who stutter, this association was confirmed by the finding that the level of state anxiety was positively correlated with a poorer quality of life, whereas trait anxiety was independent of quality of life.

The culmination of the results presented and discussed so far have supported the premise that the stuttering disorder in children and adolescents can have far-reaching and sometimes devastating effects on their life. It has been demonstrated in these children and adolescents who stutter that the stuttering disorder has impacted on their overall quality of life, clinical levels of anxiety, affective, behavioural and cognitive reactions and their ability to communicate effectively in daily living situations compared to their fluent peers.

While it has been noted by researchers that quality of life is a potentially important measure when assessing the impact of stuttering and the efficacy or effectiveness of therapeutic treatments (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), research assessing the impact of stuttering on quality of life has only recently been undertaken in adults who stutter (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Franic & Bothe, 2008; Craig et al., 2009).

Researchers investigating anxiety and stutter have posited that children who stutter are not born with inherently elevated levels of anxiety, but rather, through their ongoing experience of living with the fluency disorder, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005) and long-term negative impact on their quality of life (Craig et al., 2009).

This finding in children and adolescent who stutter of a positive relationship between state anxiety and quality of life has implications for the assessment and treatment of children and adolescents who stutter with specific emphasis on assessing

and treating the collective biopsychosocial consequences of stuttering. Research to date focusing on the treatment of children and adolescents who stutter has relied heavily on the assessment and treatment of the stuttered behaviours with less emphasis on the psychosocial aspects of the stuttering disorder.

#### 3.4.9.2 Social Anxiety and Quality of Life

In CWS and AWS, the association between social anxiety (BFNE-II) and quality of life was confirmed by the finding that levels of social anxiety were positively related with a poorer quality of life.

This fear of being negatively evaluated by others, particularly in social situations, is described as social anxiety (Messenger et al., 2004). In individuals who stutter, social anxiety is not surprising, given the likely negative evaluation of speech that has been experienced for some time (Messenger et al., 2004). Therefore it is not surprising that the long-term negative evaluation of speech may be related to poorer quality of life in these children and adolescents. As noted previously, these children and adolescents were referred to and were awaiting commencement of the Fluency & Confidence group program. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore each child and adolescent had experience period of time in their life in which their speech had been negatively evaluated.

The correlation between these psychosocial variables highlights the clinical impact that stuttering has on the young person's life. These types of results send a clear message to clinicians to assist the child and adolescent who stutter and empower them in tackling their stuttering disorder by providing them techniques and tools they require.

### 3.4.9.3 Reactions to Speaking Ability and Quality of Life

In children and adolescents who stutter, the association between reactions to stuttering (OASES-SII) and quality of life was confirmed by the finding that higher emotional, behavioural and cognitive reactions to their speaking abilities were positively related with a poorer quality of life.

The results obtained in this study support the premise that children and adolescents who stutter are experiencing more statistically significant affective, behavioural and cognitive distress and reactions concerning their speaking abilities compared to their fluent peers. In addition, these elevated reactions to their speaking ability have a strong relationship with their quality of life.

It has been noted in the literature that children and adolescents who stutter experience a variety of emotional reactions to their stuttering (e.g., Cooper, 1993; DeNil & Brutten, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutten, 1996; 1997; Watson, 1988; Yaruss, 1998; Yaruss & Quesal, 2004, 2006) and the current study endorses this claim. Further, in this study, these emotional reactions appear to pose particular quality of life challenges for these children and adolescents who stutter and they do not appear to possess the necessary coping skills for managing these strong emotions.

Public speaking, debating and group discussions and presentations are intrinsic to school life. For all young people, these activities have been identified as stressful. The need to incorporate practice and coping strategies into group therapy programs is highlighted by the findings in this study.

### 3.4.10 Environmental Factors and Quality of Life

In this study the measures of behavioural and social difficulties (SDQ) and daily communication situations (OASES-SIII) were chosen to reflect environmental factors and the OASES-SIV was chosen to reflect quality of life.

#### 3.4.10.1 Behaviour and Social Difficulties and Quality of Life

In children who stutter, the association between behaviour and social difficulties and quality of life was confirmed by the finding that an increase in behaviour and social difficulties were correlated with a poorer quality of life. In adolescents who stutter, this relationship was independent. In contrast to younger children, the adolescents in this study did not exhibit a significant relationship between behavioural and social difficulties and quality of life. This may be due to adolescents engaging in more covert and innovative sublimating behaviours and social strategies similar to the strategies that have been documented in adults (Plexico et al., 2009).

Parents of children who stutter consistently report greater behavioural problems in their children compared to those parents whose children do not have communication problems (Fowlie & Cooper, 1978; Karrass et al., 2006). The need for the intensive parent support program identified in Chapter 2 is highlighted by these findings.

#### 3.4.10.2 Communication Difficulties in Daily Situations and Quality of Life

Children and adolescents who stuttered displayed significantly higher difficulties in communicating in daily situations than their fluent peers. It has been posited that difficulties in communicating in daily situations may be the result of conditioning that occurs when a neutral communication situation is associated with negative and aversive consequences (Daly et al., 1997). Given the negative evaluation that has been associated with stuttering over time, it is not surprising that results from this current study reported children and adolescents who stuttered to experience greater difficulties with communication in daily situations compared to their fluent peers.

In children and adolescents who stutter, the association between communication difficulties and quality of life was also confirmed by the correlation analyses demonstrating a statistically significant positive relationship between communication



difficulties and a reduced quality of life. Such results underscore the significance that society places on fluent, articulate communication across all situations in society and the resulting impact that this pressure places on the child or adolescent.

The focus on total and effective communication challenges clinicians to develop appropriate treatments for children and adolescents which enhance and empower their communication skills through situational hierarchies and generalisation plans to ensure that speakers can use techniques across a variety of communication situations (Brutten & Shoemaker, 1967; 1974; Darley & Spriestersbach, 1978; Shumak, 1955; see also Hillis & McHugh, 1998; Ingham & Onslow, 1987). Ultimately, effectively coping with stuttering involves a myriad of support. The biopsychosocial framework posed by Yaruss and Quesal (2004) emphasises the inherently powerful relationship that the environment has on the person and ultimately on their ability to cope effectively in their daily interactions. This model also emphasises the importance of support networks and relationships that PWS have and the impact they have on the person's ability to function in the real world.

#### **3.4.11 Biopsychosocial Model of Stuttering**

Finally, using the data obtained from the children and adolescents in this study we investigated the factor structures of the assessment and questionnaire tools that were used in order to determine how discriminately the data mapped onto the model proposed by Yaruss and Quesal (2004).

Assessment and questionnaire data collected from the children and adolescents who stuttered in this study were analysed using exploratory factor analysis. The factor analysis reduced the data from the questionnaires into meaningful smaller components. It drew interrelationships between the various components of the Yaruss and Quesal (2004) model reflecting the impact and consequences of stuttering on children and

adolescents. This type of exploratory factor analysis of the assessment and questionnaire data has not previously been addressed in the literature for children and adolescents who stutter.

For children, a single factor was identified as accounting for almost 59% of the variance in the Impairment in Body Function component. Notably, two factors of ‘personal reactions’ and ‘anxiety’ underlay the assessment and questionnaire measures used for the Personal Reactions/Factors component and collectively accounted for almost 71% of the variance in the this model component. Again, a single factor accounted for almost 61% of the variance in the assessment and questionnaire data of the Environmental model component. Finally, a single factor was identified as accounting for almost 72% of the variance in the assessment and questionnaire data for the Quality of Life component. These results in CWS demonstrate that the set of assessments and questionnaires used within this study mapped strongly onto the Yaruss and Quesal (2004) model.

For adolescents the structures of the components are more complicated in Personal and Environmental model components reflecting the diversity and challenges that arise developmentally over time. One factor arose as accounting for almost 55% of the variance within the Impairment and Body Function model component. The two factors of ‘anxiety’ and ‘personal reactions’ were reversed for this older cohort while accounting for almost 67% of the variance in the Personal model component. Further, the two factors ‘family and social’ and ‘school’ were identified as responsible for almost 76% of the variance in the Environmental model component. Finally, one factor was identified as representing almost 73% of the variance in the Quality of Life model component.

Two main findings emerged from these factor analyses. Firstly, in children and adolescents, the questionnaire and assessment data mapped very strongly onto the

Yaruss and Quesal (2004) model and in doing so demonstrated great integrity of this holistic biopsychosocial perspective. Secondly, the differences between the two age groups showed the impact of the time trajectory of this complex speech disorder particularly for the Personal and Environmental model components. The specific factors of ‘anxiety’ and ‘school’ emerged as unique with the greatest impact for adolescents. Collectively, the detailed assessment of children and adolescents using the Yaruss and Quesal (2004) model as a framework provides a more detailed explanation of the complexities and diverse impacts of stuttering on the young developing person. These findings support the premise that this model assists in documenting the biopsychosocial experiences of the children and adolescents who stutter, and through the documentation of their negative experiences clinicians can more comprehensively focus the necessary treatment protocols to counteract the negative impact of stuttering on their lives.

#### **3.4.12 Clinical Management of Children and Adolescents who Stutter**

The primary priority of speech pathologists who are charged with the responsibility of managing the stuttering disorder include the need to fully understand prognostic indicators, familial inheritance, precise treatment history and psychosocial issues. The finding that children and adolescents who stutter have higher levels of state, trait and social anxiety; higher behavioural, social and communication difficulties; and poorer quality of life is sobering and significant for clinicians. The current results suggest a place for more integrated psychosocial treatments in the management of children and adolescents who stutter, particularly for speech-specific difficulties or where anxiety is pronounced. Integrated psychological therapies which are focused on anxiety reduction, improving functional communication limitations and improving the psychosocial impact of stuttering need to be examined more thoroughly in light of these current findings regarding the impact of the stuttering disorder on anxiety and other psychosocial variables in children and adolescents who study (current study; Mulcahy et

al., 2008). These integrated psychological therapies may include reducing the child's negative reactions to stuttering through desensitisation and acceptance and commitment therapy; reducing the negative impact of the child's environment through desensitisation and situational hierarchies; and reducing activity limitations and participation restrictions through strategies which support generalisation and communicating effectively in all situations. In Australia, the majority of speech-language pathologists regularly include anxiety management strategies in the treatment of their adult clients, however the use of these psychological therapies are not as frequently utilised in children and adolescent clinical populations. Although the specific content and success of such treatments are yet to be identified, the findings from this current study suggest that a biopsychosocial approach to treatment is encouraged in children and adolescents who stutter.

These results here also highlight the need to be mindful of children and adolescents who stutter as a separate and unique cohort not to be conjoined with younger adult interventions. It has been demonstrated within this study that children and adolescents present with different priorities for therapy as a group as well as individually. It is recommended that a flexible and holistic view to treatment choices be adopted in the management of children and adolescents who stutter, as it is clear that these clients intrinsically differ in their symptoms and reactions to their stuttering experience.

#### **3.4.13 Limitations and Future Research**

A range of specific limitations of this study are evident which restrict the conclusions that can be drawn. A discussion of the limitations and future research directions are provided below.

#### 3.4.13.1 Self-Report Data Collection

This research study used self-report measures to assess the various psychosocial variables under investigation. This form of quantitative measurement presents a number of issues, including the operation of response bias and shared variance between the measures. In addition, the complete form of the OASES questionnaire has not previously been used in published research in populations of children or adolescents who stutter and the validity and reliability in the child and adolescent cohorts has not yet been established. In reality, however, self-report methods are currently one of few available methodologies for the collection of subjective data and the use of questionnaire methodology is widely accepted as valid and reliable (Turk & Melzack, 1992).

Subsequent research might consider alternate sources of data such as qualitative research methods or information obtained by significant others to verify and cross-validate the self-report responses of children and adolescents who stutter. An attempt was made in the study described in Chapter 6 to obtain quantitative data and information from the parents of children and adolescents who stutter in the hope of obtaining a more comprehensive assessment of the impact of stuttering on the child or adolescents. Future research studies may incorporate qualitative interviews of parents or significant others such as siblings into the research assessment process.

#### 3.4.13.2 Cross-sectional Analysis

This study is a cross-sectional analysis and therefore causal attributions could not be made about the nature of the relationships between the stuttering disorder, and assessed anxiety and psychosocial variables in children and adolescents who stutter. Longitudinal studies of children and adolescents who stutter are essential to gain a

better understanding of those factors that are prognostic in long-term adjustment to both stuttering itself and to the impact of stuttering on other biopsychosocial areas of the child or adolescent's life.

#### 3.4.13.3 Children and Adolescent Cohorts

This cohort of children and adolescents is a very specific sub-set of young people who stutter, given that they were drawn from the Wait-List for an innovative biopsychosocial Fluency & Confidence group treatment program specifically run by the Curtin University Stuttering Treatment Clinic. Thus the findings cannot be considered representative of all children and adolescents who stutter living in the community. However, these children and adolescents may be considered to be indicative of children and adolescents who stutter presenting for treatment that had previously been provided with speech pathology therapy interventions which were deemed by either the clinician or parents not to have achieved significant improvement or success.

It is important that future research studies which include more heterogeneous samples of children and adolescents who stutter replicate the assessment and treatment studies documented in this thesis. Replication of this study would enable investigation of the strength and universality of the differences and relationships documented in this Chapter 3. It is hoped that future studies will investigate and provide empirical support for a biopsychosocial approach to the assessment and treatment of children and adolescents who stutter.

#### 3.4.13.4 Replication of Findings

The results documented in this Chapter 3 offer some enticing hints about important relationships which may become targets for more effective treatments for children and adolescents who stutter. The uniqueness of this study and its findings

necessitates that other researchers and further studies replicate these findings in a larger sample size of children and adolescents who stutter. These studies should ideally be prospective in nature and include the various psychosocial measures which have been detailed in this thesis.

#### 3.4.13.5 Biopsychosocial Theories, Models and Supportive Data

It has been stated by the developers of the biopsychosocial model (Yaruss and Quesal, 2004) which is referred to and used extensively in this thesis that “the most pressing need related to this treatment approach is empirical documentation that it is effective in helping children who stutter improve their fluency, minimise negative reactions, and reduce the negative impact of this disorder on communication in daily activities and participation in life.” (Yaruss, Pelczarski, & Quesal, 2010, p.241). The body of research described in this study used quantitative techniques to explore biopsychosocial issues pertinent to childhood and adolescent stuttering experiences. This new findings will then be used to expand the knowledge base of biopsychosocial effectiveness based treatments for children and adolescents who stutter (Chapter 6).

Currently, limited published research exists which uses this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). To date, the incorporation of a psychosocial perspective to the assessment and treatment of stuttering in children and adolescents has only been documented in a limited number of previous research studies (Craig et al., 1996; Hancock et al., 1998; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). Therefore, biopsychosocial theories and models which are comprehensively tested and determined to account for the consequences of stuttering in childhood and adolescents are urgently needed to drive research in this area. The primary goal of this study, and the documented studies to follow (Chapters 4 – 6), was to be a preliminary

catalyst for future developments in the practice of biopsychosocial assessment and treatment of stuttering disorders in children and adolescents.

### **3.5 Chapter Summary**

In summary, children and adolescents who stutter for whom early speech pathology treatment was deemed unsuccessful, were found to have significantly greater levels of state anxiety, trait anxiety, social anxiety, behavioural and social difficulties, self-awareness of their speaking ability, reactions to their speaking ability, communication difficulties and poorer quality of life than their fluent peers. These results are both theoretically and clinically significant and advocate the need for a biopsychosocial perspective when managing children and adolescents who stutter. In addition, the results documented in this Chapter 3 support the proposal that the stuttering disorder in children and adolescents who stutter may impact significantly on the anxiety levels and psychosocial functioning given the various relationships detailed between the severity of stuttering and these psychosocial variables. The stuttering disorder in some children and adolescents who stutter encapsulates psychosocial conflict in addition to the presenting speech symptoms.



#### **4.0 CHAPTER 4: ADOLESCENTS WHO DECLINE TREATMENT**

Chapter 3 constituted the first in a series of three cross-sectional studies designed to explore the relationship between anxiety, psychosocial variables and stuttering severity.

Chapter 4 comprises the second study in the series. This study employed a mixed methods design incorporating semi-structured interviews and quantitative questionnaires to explore the barriers which precluded adolescents from attending therapy. The implications and future clinical directives addressing commitment and participation in holistic biopsychosocial Fluency & Confidence group treatment programs are presented.

#### **4.1 STUDY AIM AND HYPOTHESES**

This study addressed three areas of investigation: i) Qualitative themes of barriers to acceptance and participation in the adolescent group treatment program; ii) Quantitative analysis of any significant differences in relation to the barriers to treatment, between adolescents who accepted and participated in the group treatment program compared to adolescents who declined treatment; and iii) Quantitative assessment of significant differences between the inter-relationships between anxiety, psychosocial variables and stuttering severity in these two adolescent cohorts.

Firstly, using phenomenological qualitative analysis, themes of barriers to acceptance and participation in the adolescent group treatment program were explored. The documented themes were then positioned within the components of the framework of the Yaruss and Quesal (2004). Given the background detailed in Chapter 2, it was posited that a variety of themes would emerge which would give a deeper insight into barriers to stuttering treatment for adolescents.

Secondly, using quantitative analyses, differences in relation to the barriers to treatment between adolescents who accept and participate in the group treatment program and adolescents who decline treatment were explored. Again it was posited that significant differences would exist between these two adolescent cohorts which would provide insight into future therapeutic methods to counteract these barriers which exist for adolescents in seeking treatment.

Finally, Chapter 4 explored whether any significant differences exist between adolescents who accept and decline treatment when measuring anxiety, psychosocial variables, and stuttering severity; and whether any significant differences exist when measuring the relationships between anxiety, psychosocial variables and stuttering severity. The hypothesis was that there would be some differences between adolescents who accept and adolescents who decline treatment with respect to anxiety, psychosocial variables, and stuttering severity levels in addition to some significant inter-relationship differences.

## **4.2 Treatment of Stuttering in Adolescents**

Adolescence is often a difficult phase of maturation during which emotional, social and physical stages interweave. Clinically, as a cohort, adolescents are particularly challenging because these years are characterised by emotional conflicts, fears, and frustrations (Daly, Simon, and Burnett-Stolnack, 1995). There are also the compounding anxieties and negative consequences of stuttering which have been documented in Chapter 3. In acknowledging the special nature of this adolescent population, Blood (1995) noted that the unsuccessful treatment history adolescents have experienced may reduce their motivation for further therapy. In a survey conducted of 287 school-based clinicians by Brisk, Healy, and Hux (1997), it was reported that clinicians felt that they had fewer successes with AWS compared to any other age groups. Other clinical researchers, including Manning (1991) and more recently

Zebrowski (2002), have found that difficulties are often encountered when attempting to convince an AWS to enrol in treatment. Therefore, achieving therapeutic success with AWS requires understanding at least as much about adolescence as it does about stuttering (Manning, 2010).

In life, the handicapping effects of stuttering often increase as children reach the early adolescent years. Peer pressure and acceptance to conform become major factors in the social life of the adolescent students and teasing and bullying, if they have not already occurred, often peak at this time (Blood & Blood, 2004; Davis et al., 2002; Langevin, 1997, 2000; Langevin et al., 1998; Murphy & Quesal, 2002; Murphy, Yaruss. & Quesal, 2007a, 2007b; Yaruss et al., 2004). Clinically, it is common for the inappropriate actions of others to be the catalyst for an adolescent to seek therapeutic assistance. The adolescent who stutters initially attempts to respond to these pressures through avoidance, denial, and undesirable coping strategies which become further refined and sophisticated until these unhelpful coping strategies becomes less efficient and the adolescent reaches crisis point.

Given all the problems presented by stuttering during adolescence, there are many reasons why these individuals are likely to resist treatment. The competing priorities for the adolescent make it difficult to convince adolescents who stutter about the advantages of further treatment. Although stuttering may be seen as a problem, it is not usually seen as the most pressing problem. Alternatively, given the past experience of unsuccessful treatment, the benefits of further commitment may be tainted. Many adolescents harbour the hope that, with time and maturity, they will outgrow the problem of stuttering or at least, postpone having to deal with it directly (Manning, 2010).

In some instances, adolescents who are willing to engage in treatment find it difficult to take responsibility for practicing and committing to the dedication needed

for change. While they may be willing to attend treatment sessions, they limit the use and practice of the behavioural techniques in daily speaking situations often out of concern for sounding unnatural. Many of the activities and techniques associated with treatment strategies tend to highlight the speaker and set them apart from their peers, which is a contradiction to the anonymity they often crave (Manning, 2010).

In addition, adolescents are especially sensitive to prescriptive information by adults (Zebrowski, 2002) or to the possibility of being patronised (Haig, 1986). If clinicians or parents are unable to communicate directly and openly, they risk alienating the adolescent who stutters even further. Some adolescents who stutter lack the coping strategies and skills to confront difficult and uncomfortable emotions, and often deflect responsibility or blame to others, including clinicians, parents, siblings and teachers. It may be particularly uncomfortable and aversive for some adolescents to involve their family. Many adolescents are characteristically striving on many levels to become independent of adults.

To date, it has been consistently reported that a frequent occurrence is for the adolescent to decline therapy (Hearne, Packman, Onslow, and Quine, 2008). The professional challenge is to more clearly understand and address barriers and not accept previous complacency for these young people.

## **4.3 METHODS**

### **4.3.1 Participants**

Of the 36 adolescents who were referred to the Curtin University Stuttering Treatment Clinic for admission to the Fluency & Confidence Program, 15 of the 36 adolescent participants who were assessed at Wait-List declined the opportunity to attend. Each of these 15 adolescents who chose not to participate in the F & C program was interviewed and their qualitative data is contained within the qualitative section of this Chapter 4.

The quantitative data was obtained from all 36 adolescents who originally completed the five quantitative questionnaires (detailed in Chapter 3) eight weeks prior to the F & C program commencement. The data from these quantitative questionnaires was separated into 2 groups: i) adolescents who accepted and participated in the F & C group program (AWS Accept;  $N = 21$ ) and ii) adolescents who declined participation in the F & C program (AWS Decline;  $N = 15$ ).

### **4.3.2 Procedure**

Caregiver permission for research participation was sought and gained prior to contacting the adolescent participants. Informed consent by the caregiver and each adolescent was obtained. Each adolescent was visited in their home and interviewed by the author of this thesis in a quiet comfortable setting. A semi-structured interview format was followed with flexibility in questioning and all questions were framed in a positive, open ended and probing manner. The duration of interviews lasted on average 30 to 60 minutes. Interviews were audio taped using a ZOOM H4n audio recording device and transcribed verbatim post interview.

This research was approved by the Curtin University of Technology Human Research Ethics Committee.

### **4.3.3 Data Analysis**

#### **4.3.3.1 Qualitative Measures**

The methodological framework adopted was a qualitative, phenomenological approach known as thematic analysis which is appropriate when the subject of research is previously unexplored. The thematic analysis, which focuses on identifying recurrent themes within a data set, was applied to all the interview data.

Analysis of each single transcript was conducted by the author of this thesis to identify significant emergent themes and interconnections. Through scanning and analyses, documented themes were positioned within the holistic biopsychosocial model by Yaruss and Quesal (2004). Saturation of themes was achieved as no new ideas or views emerged through further analyses of the transcripts.

#### 4.3.3.2 Quantitative Measures

The five quantitative questionnaires (detailed in Chapter 3) were administered to the total adolescent cohort of 36 participants 8 weeks prior to the F & C program commencement.

The data from the questionnaires was separated into 2 groups: i) adolescents who accepted and participated in the F & C group program (AWS Accept;  $N = 21$ ) and ii) adolescents who declined participation in the F & C program (AWS Decline;  $N = 21$ ).

## 4.4 RESULTS:

### 4.4.1 Qualitative Themes

Varied and distinctive themes emerged as a result of the qualitative investigations. These constituted barriers to attendance at and participation in the F & C group program. Such reported obstacles have been sub-divided and positioned within the biopsychosocial components of the Yaruss and Quesal (2004) model. The specific barriers reported are summarised in Table 4.1.

Table 4.1: Types of Barriers Precluding Access to the F & C Group Therapy Program

Themes	N
<b><i>Impairment in Body Function</i></b>	
Limited knowledge and self-awareness	12
Severity of stuttering	8
Concomitant difficulties in learning and concentration	2
<b><i>Personal Factors/Reactions</i></b>	
Experiential Avoidance	12
Feelings – embarrassment, frustrated, annoyed, angry, sad, etc	10
Creative hopelessness	6
Cognitive Fusion: self-critical	5
Lack of trust in group therapy and clinicians	5
Did not view their stuttering as a serious problem	5
Low priority	5
<b><i>Environmental (Group vs Individual)</i></b>	
Negative impact of group therapy	11
Negative impact of group therapy on self identity	7
Negative impact of group therapy on anonymity	6
Negative impact of group therapy on the severity of their stutter	5
Reduced effectiveness of group therapy compared to individual therapy	5
<b><i>Quality of Life</i></b>	
Experiential Avoidance	10
<b><i>Previous Negative Experience with Therapy Research</i></b>	
Randomised controlled trials	2

Note: N = number of adolescents who referenced each separate theme.

Further analysis revealed an independent decision by each adolescent not to participate in the F & C group therapy program.

#### 4.4.1.1 Impairment in Body Function

The most frequent theme of *Impairment in Body Function* was the limited knowledge and self-awareness possessed about stuttered behaviour.

##### *Limited knowledge and self-awareness about stuttering behaviour*

Twelve participants reflected limited knowledge and self-awareness:

“I have been doing this forever. There is something wrong with the way that I speak and I don’t know any more than that. I don’t want to know any more than that. I can’t do anything to fix it so I just have to put up with it.” (A23)

“I try and speak but sometimes it just doesn’t come out at all. Sometimes I just um can’t talk. I can’t talk at all sometimes. I don’t know why. I just can’t.” (A24)

“I think it has something to do with the way I breathe or don’t breathe properly. Someone that I went to see said I wasn’t breathing properly.” (A27)

“I stutter when I am worried about something or when I am speaking fast.” (A28)

“I think that it is a confidence thing. I stutter because my Dad stutters. That is all that I know about it. Is that what you mean? I don’t understand stand it but I know it.” (A30)

“It is either something in my head or my throat. All I know is that I can’t talk without stuttering.” (A31)

“I know what I want to say but I can’t get the words out. It is a breakdown between my brain and my mouth.” (A36)

### *Severity of stuttering*

Eight adolescents predicted that the group therapy program would have a negative impact on the severity of their stutter:

“That possibly my stuttering was the worse stuttering in the whole group. I would feel that my stuttering was the worse and I would think ‘I’m really bad here, I’m worse than anybody’, and that would make me feel worse about myself.” (A22)

“When I am blocking everyone would be looking at me and saying what is his problem. God he has it bad.” (A36)

### *Concomitant difficulties in learning and concentration*

Two adolescents reflected that a structured group therapy program would further complicate school difficulties:

“This group would be just like school. I am not good at school. I hate school. It is too hard to do anything right. I am not good at learning and concentrating and doing homework. I want to leave school as soon as I can. This would just be another thing that I am not good at.” (A8)

“I would find it difficult to concentrate. I don’t find learning easy at high-school and I am no good at reading very well. Do you have



homework? I don't do homework. It would be too hard for me.”  
(A25)

#### 4.4.1.2 Personal Factors / Reactions

The most widespread *Personal Factor/Reaction* barriers were experiential avoidance and feelings of fear and embarrassment at the prospect of attending the group program.

##### *Experiential avoidance*

Twelve of the 15 adolescents (80%) reported avoidance of speaking in public and that the group therapy program would involve a lot of speaking in front of others:

“When I was young I become very good at avoiding speaking in class, on the phone or ordering food when we went out. I felt like ok they're going to do all the talking so don't worry about it.” (A23)

“I don't stutter much because I know which words not to use. I don't like to talk in front of people so I don't and it isn't a problem. If the teachers want me to talk in front of the class I just say no and Mum and Dad said I don't have to talk if I don't want to and they go talk to the teacher so that I don't have to.” (A27)

“I just get out of it by pretending that I am sick or I just stay away from school when I have to give a talk. The teachers are used to it now I think.” (A28)

“I don't want to come to group therapy that makes me speak in front of a group. I don't want to feel worse than I already feel about my stutter.” (A33)

##### *Feelings: embarrassment, frustrated, annoyed, angry, sad etc*

Ten adolescents reported negative emotions associated with stuttering and the prospect of group therapy:

“I think it [group therapy] will make me feel more embarrassed about my stutter and I will find it difficult to say anything with other people around. Just thinking about it now makes me worry. I really don't want to do it.” (A24)

“When I think of my stutter I am embarrassed and sad. I don't want to go to the group because it already makes me feel upset. I don't want others looking at me and listening to me or thinking I can't talk properly. I don't want people watching me all the time.” (A32)

“Just perhaps coming away with having more worries in my head, listening to some of the other problems.” (A35).

“I am already frustrated at how much attention everyone keeps putting on my stutter. That is all that Mum and Dad talk about. I just want to be left alone and stop talking about it.” (A36)

“When I was really little I spoke in front of the class and the teacher told me that I was not very good because I talked funny. I think since I was little I have hated talking in front of people and I don’t talk much at school because I am so embarrassed and worried that I will stutter.” (A28)

### *Creative hopelessness*

Six adolescents reported anticipated failure given previous unsuccessful therapy:

“It is not worth it. It won’t work. Everything I have tried has not worked and I have tried a lot. Mum thinks it would be good to have a go but why bother. No offence but I can’t be bothered because I know that it will not work for me.” (A33)

“I don’t like to think about my stutter because there is nothing I can do about it. Mum has taken me to see someone before and she couldn’t help me. I got this when I was little and I am stuck with it forever.”(A35)

### *Cognitive Fusion: self-critical*

Five adolescents reported comments that were consistent with cognitive fusion and self-criticism:

“I already know I stutter. I already know that there is something wrong with me. Why would I want everyone else to know what is wrong with me and think I am dumb or stupid as well.” (A22)

“I think that people think I am dumb because I don’t talk very much. I think I’m stupid sometimes.” (A28)

### *Lack of trust in group therapy and clinicians*

Five adolescents reported a distrust in clinicians and therapy based on previous negative experiences:

“I have tried therapy before for help and it didn’t help. I don’t think that they knew what they were doing. She thought I was getting better but I just wasn’t talking much with her so I wasn’t stuttering. Then I would go home and I was stuttering a lot. She didn’t have a clue. Mum and Dad stopped paying because they said that it didn’t help.” (A29)

“Mum took me to see a psychologist. I think it was a psychologist. Mum said that I was not right in the head. I hated him. He just tried to get into my head. I have enough stuff going on in my head without him in there. I never went back. Is that what you do in this group? Do you get in people’s heads? I don’t want anybody in my head.” (A22)

### *Did not view their stuttering as a serious problem*

Five adolescents reported that stuttering, as they experienced it currently, did not constitute a problem:

“The group might be good for some people but I don’t think I have a problem like other people. I don’t stutter much so I don’t think that the group could really help me. My parents think I should go but I don’t think so. I am okay.” (A27)

“Mum thinks that I have a problem but I don’t. I am managing okay by just being careful about what I do and don’t do. I think what you are doing is a good thing but I don’t need it.” (A35)

### *Low priority to them*

Five adolescents reported that obtaining treatment for their stuttering was a low priority for them:

“I am busy, really busy. I do a lot of sport and have a lot of homework to do already. It would be a waste of my time because I would be too busy to do homework you give me. Sorry - I am just too busy.” (A29)

“My parents say that the group would be good but I have so much on at the moment. I am committed to my team and training and that is more important to me right now.” (A31)

#### 4.4.1.3 Environmental Factors

The most consistent *Environmental* barriers were the adolescent's perceptions of the negative impact of the group therapy environment plus the fear of judgement in the group environment by other participants and clinicians.

##### *Negative impact of group therapy*

Eleven adolescents identified discomfort, in terms of a possible increase in social anxiety, fear, embarrassment and bullying. Individual therapy was deemed preferable:

"Nah. I couldn't hack it. Really it would be too hard for me. I don't mind seeing someone alone with just me and them like I am talking to you now but I can't hack a group with everyone. That is just too hard." (A26)

"I already have people at school teasing me and the teachers don't do nothing about it. Why would I want to do something like this and have more people judge and tease me?" (A29)

##### *Negative impact of group therapy on self-identity*

Seven adolescents reflected a perceived risk that interaction with other adolescents who stuttered could result in more problems than gains:

"I don't want to sort of start making friends with other kids with the same thing, and I don't want to be called a kid who stutters. Everyone in the group would know that it was a group of kids who stutter and everyone running the group would call us kids who stutter." (A25)

There was a view expressed that group therapy would prove a burden with a "stuttering identity" resulting in a negative impact on self-concept:

"But I think I would start to see myself as being different, really different. Because at the moment, I know that it's different to other kids, but I don't see myself as different because they don't know that I stutter." (A24)

"If you sort of walk in and say well, you know, you stutter and this is how we are going to deal with it and you say it every time in the group then I am going to believe it, you know, that I stutter. I am told that I am dumb and stupid all the time and I believe it because I am told it all the time. If I am seeing only one person for help with my stutter, I

suppose, you would slowly bring it round to working all the techniques in but you wouldn't use the word stutter all the time." (A32).

"I don't want to talk about this stuff in a group. I don't want to talk about this stuff at all. It would be really hard to talk about this stuff in a group. Maybe if it was just me and one person it would be easier but not in a group." (A23).

#### *Negative impact of group therapy on anonymity*

Six adolescents reported possible discomfort at the prospect of meeting someone else who stuttered:

"I don't know anyone else who stutters. I keep my stutter to myself so maybe there are other people who stutter but they keep it to themselves. It is easier for me to keep my stuttering to myself. I would find it really uncomfortable being around other people who stutter. I don't want to talk about my stutter to anyone." (A34)

#### *Negative impact of group therapy on severity of their stutter*

A salient theme expressed was that group therapy was more unpredictable, had more risks involved and could increase problems for the adolescent. Five adolescents believed that being present with others who stuttered would increase the severity of their stutter:

"If the bunch of us all spend time together in a group and we are all stuttering like mad then we will make each other stutter more and more. I don't want to do that. That would not help me at all." (A28)

"I think the risks [of stuttering] are spread out more in a group situation." (A32)

"[Group therapy] It will make the stuttering worse for me, or it will make me worry more because some of them are going to have different problems to what I have. Some of them are going to have problems with speaking in class and some of them will have problems speaking on the phone and I am worried that if I hear about other people's problems then I might get that problem too." (A29)

"I got the stuttering from my Dad. Imagine if I was in a group of kids who stutter how much more stuttering I would get." (A30)

### *Reduced effectiveness of group therapy compared to individual therapy*

Five adolescents voiced concern that group therapy would be less effective than individual therapy. A recurring theme was the possible heterogeneity in stuttering profiles among adolescents. Many adolescents felt that the techniques delivered would be too generic, and would not individually address stuttering symptoms. Some adolescents believed group therapy might alienate some group members whose stuttering behaviours were not represented within the group:

“I think you probably learn a lot more strategies [in individual therapy], because it’s actually, with stuttering, there are many, many things that we do and for someone like me would be totally different to another person’s so at least they’d deal with particular things that we do.” (A23)

“I mean like, some of the strategies would be good for the whole group, whereas if you’re dealing with just one person she would then tailor them perhaps just for you, and maybe perhaps target the problem better. Whereas, in a group they’d be too all over the place.” (A34)

“[In individual therapy] You might get more expert help, you know, like from someone who’s a speech pathologist, you actually get some help, whereas in a group I don’t know how the help situation operates, whether it is in groups or whether there is someone going to be saying ‘You can do this yourself’, you know, that it would be more individual.” (A34)

“Because for me, it was a big secret, and I didn’t want anyone to know. And being able to talk to someone outside of the family that kind of knew what I was going through made me realise ‘Oh, I can talk about it to other people’. And so then I was much more comfortable talking to like, my Mum and Dad and family as well. Yeah, it allowed me to open up and I think that if I was put into a group situation first of all I wouldn’t have opened up.” (A23)

“There’s a lot of things that I mean. I have to hide some things and keep them to myself and I would not talk about these things in a group because they’re probably a bit more personal.” (A31)

“I think that it [group therapy] doesn’t get to the real stuff as much as individual therapy can.” (A34)

“I get ignored at school because I am quiet and don’t talk much. In my report teachers keep writing that I don’t care and don’t try. I just don’t like to talk. In a group it would be just like that.” (A33)

“Listen. It would be hard to look after everyone in a group. How can you help everyone all at once.” (A29)

“I don’t want everyone knowing my personal stuff.” (A23)

“I hate asking questions at school so I don’t. It [Group therapy] would be just like that.” (A33)

There were concerns expressed that adolescents could not participate actively in the group due to excessive social anxiety. Some adolescents were worried that they might not form as close a relationship with the clinician and there may not be a strong a therapeutic alliance and therefore individual therapy was deemed preferable in the treatment of unique individual difficulties.

#### 4.4.1.4 Quality of Life

The most common *Quality of Life* barrier to participating in the group was experiential avoidance. Ten adolescents expressed the perception that the group program would impact negatively on the self control they currently realise and the situational avoidance they use:

“My parents want me to come to the group and get help but I don’t like being around other people who are listening to me talking. I like being alone and I like it that way. I don’t do much outside school and home and I like it that way. It is easier that way. In the future I will do a job that means that I don’t have to talk to people much. Maybe with computers or something like that.” (A29).

#### 4.4.1.5 Previous Negative Experiences with Therapeutic Research Programs

The possibility that adolescents did not participate in the program because of the research component, was explored with thirteen participants supporting the research project, and two identifying the issue of participating in a *research study* as the barrier:

“My speech therapist told my Mum that the group might help me with my stuttering. The last research therapy that I had was not very helpful. I went to see them. They told me that they would see me again in a couple months time and that I couldn’t get any help for my stuttering while I was waiting. My stuttering got worse and Mum and Dad took me to a speech therapist and then I was told that they didn’t want me any more in the research therapy because I went and got help for my stuttering.” (A23).

“I have done this before you know. When I was younger I was in research and they told me to go away and come back later. Mum said that I was part of a group that didn’t get the therapy. What a waste of time that was.” (A27).

Two participants had previously been recruited as young children in a former randomised controlled trial. The history had been that they were randomly allocated to the control group which did not receive therapy. The impact of this on their willingness to engage in future therapy for their stutter and their lasting perception of stuttering research as a whole is extremely concerning. The impact that previous research had on these two adolescents is a violation of the Speech Pathology Australia professional Code of Ethics i.e., beneficence (benefiting others) and non-maleficence (preventing harm) (Speech Pathology Australia, 2001).

#### 4.4.1.6 Follow-up Future Contact

Following non-participation in the F & C group program, each adolescent was given another opportunity to participate in the next F & C group and again declined participation. Three months following these studies, ten adolescents had not received any treatment (67%), three had received individual therapy with a speech pathologist (20%), and two had received individual therapy with a school psychologist (13%).



#### 4.4.2 Quantitative: AWS (Accept Group) vs AWS (Decline Group)

#### 4.4.3 Descriptive Data Analysis

Descriptive statistics were computed for the Percentage Syllables Stuttered (%SS), STAI (state and trait anxiety), BFNE-II, SDQ, OASES (Sections I, II, III & IV), SOC (precontemplation, contemplation, action and maintenance), and Age, and are shown in Tables 4.2. Effect size was calculated using Cohen's *d* (Cohen, 1988).

Table 4.2: Means and Standard Deviations for AWS (Accept) and AWS (Decline)

Measures	AWS (Accept) ( <i>N</i> = 21)		AWS (Decline) ( <i>N</i> = 15)		<i>p</i> value	Effect size
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<b><i>Impairment</i></b>						
% SS	5.60	3.80	6.43	4.19	.54	.21
OASES-SI	60.86	9.90	61.80	7.67	.76	.11
<b><i>Personal</i></b>						
STAI (state)	53.86	4.73	56.13	4.56	.16	.49
STAI (trait)	56.52	2.99	56.60	2.64	.94	.03
BFNE-II	45.86	4.39	48.20	4.49	.13	.53
OASES-SII	62.25	8.92	66.31	4.36	.11	.58
<b><i>Environmental</i></b>						
SDQ	13.52	1.86	14.40	1.50	.14	.52
OASES-SIII	63.92	10.39	67.04	6.50	.31	.36
<b><i>Quality of Life</i></b>						
OASES-SIV	55.89	12.46	62.35	4.30	.06	.69
<b><i>Stage of Change</i></b>						
SOC (PRE)	30.81	3.86	36.27	2.87	< .001	1.61
SOC (CONT)	32.05	5.54	26.07	2.69	< .001	1.37
SOC (ACTION)	27.29	5.25	21.60	1.88	< .001	1.44
SOC (MAINT)	27.52	4.48	23.73	0.96	< .01	1.17
<b>Age</b>	12.48	0.68	15.40	0.99	< .001	3.44

#### **4.4.4 Between Group Comparisons**

##### **4.4.4.1 AWS (Accept) and AWS (Decline)**

An independent samples *t*-test showed a significant difference between the ages of AWS (accept) and AWS (decline),  $t(34) = -10.55, p < .001$ .

Mean scores obtained on the STAI, BFNE-II, and SDQ questionnaires from AWS (accept) and AWS (decline) were compared to published normative data reported in the literature (Spielberger, 1973; Carleton et al, 2007; Mellor, 2005). The mean scores obtained on the OASES questionnaire were compared to the impact rating scales reported by Yaruss and Quesal (2006, 2008). The mean scores on the Stage of Change questionnaire were used to position the AWS cohorts onto the various stages of readiness for change model (Floyd et al., 2007).

In addition, independent samples *t*-tests were also computed to test for significant differences between the AWS (accept) and AWS (decline) on STAI (state and trait anxiety sections), BFNE-II, SDQ, OASES (Sections I, II, III & IV), and SOC (precontemplation, contemplation, action and maintenance). The results obtained (as shown in Table 4.2) demonstrated significant differences between the groups on some measures with large effect sizes (Howell, 2007). An alpha level of .05 (two-tailed) was used for all statistical tests.

#### *Impairment in Body Function*

Sixty six percent of the AWS (accept) demonstrated moderate stuttered speech severity (2-5 %SS) and thirty four percent demonstrated severe stuttered speech severity (>5 %SS) as classified by Guitar (2006). By contrast, forty percent of the AWS (decline) demonstrated moderate stuttered speech severity (2-5 %SS) and sixty percent demonstrated severe stuttered speech severity (>5 %SS).

Mean scores obtained which assessed self-awareness and knowledge of stuttering (OASES-SI) corresponded to a moderate-to-severe impact rating for both the AWS (accept) and AWS (decline) (Yaruss and Quesal, 2006).

A comparison between the means showed that AWS (decline) demonstrated a non-significantly higher severity of stuttering (%SS) compared to AWS (accept),  $t(34) = -.61, p = .54$ ; and a non-significantly higher self-awareness and knowledge of stuttering compared to AWS (accept),  $t(34) = -.31, p = .76$ .

#### *Personal Factors / Reactions*

Mean scores obtained for the state and trait anxiety inventory (STAI) for both AWS (accept) and AWS (decline) were above the mean for state ( $M = 39.45$ ) and trait ( $M = 40.17$ ) anxiety scores reported in published normative data for high school students (Spielberger, 1983), indicating that both AWS (accept) and AWS (decline) scored above normal clinical limits. A comparison between the means showed that AWS (decline) demonstrated non-significantly higher state anxiety scores,  $t(34) = -1.46, p = .16$ ; and non-significantly higher trait anxiety scores,  $t(34) = -.08, p = .94$  compared to AWS (accept).

Mean scores for AWS (accept) and AWS (decline) obtained from the fear of negative evaluation questionnaire (BFNE-II) were both above the mean scores of 19.68 (for males) and 25.20 (for females) reported in normative data for university students (Carleton et al, 2007), indicating that both AWS cohorts scored above clinical limits. A comparison between the means showed that AWS (decline) demonstrated a non-significantly greater fear of being negatively evaluated,  $t(34) = -1.57, p = .13$  compared to AWS (accept).

Mean scores obtained which assessed reactions to stuttering (OASES-SII) corresponded to the moderate-to-severe impact rating for both the AWS (accept) and

AWS (decline) groups. The data demonstrated that AWS (decline) showed a non-significant greater reactions to their stuttering,  $t(34) = -1.62, p = .11$  compared to AWS (accept).

### *Environmental Factors*

Mean scores for both the AWS (accept) and AWS (decline) groups which assessed behavioural and social difficulties (SDQ) were above the mean scores of 8.72 (children older than 11) reported in published normative data of Australian children (Mellor, 2005) indicating that both AWS cohorts scored in the clinical range of behavioural and social difficulties. This result demonstrated a non-significantly higher behavioural and social difficulties reported by AWS (decline) compared to AWS (accept),  $t(34) = -1.51, p = .14$ .

Mean scores obtained for which assessed communication difficulties in daily situations (OASES-SIII) corresponded to the moderate-to-severe impact rating for both the AWS (accept) and the AWS (decline) groups. This data demonstrates that AWS (decline) showed a non-significantly greater communication difficulty in daily situations compared to AWS (accept),  $t(34) = -1.03, p = .31$ .

### *Quality of Life*

Mean scores obtained which assessed quality of life (OASES-SIV) corresponded to the moderate impact rating for the AWS (accept) and moderate-to-severe impact rating for the AWS (decline) cohorts. A comparison between the means showed that AWS (decline) demonstrated a non-significantly poorer quality of life compared to AWS (accept),  $t(34) = -1.92, p = .06$ .

### *Stage of Change*

Mean scores obtained for the Stage of Change questionnaire demonstrated that the majority of AWS (decline) were positioned between the 'precontemplation' and 'contemplation' stage of readiness for change, whereas the AWS (accept) were positioned between the 'contemplation' and 'action' stage of readiness for change (Floyd et al., 2007). This results therapeutically positions the AWS (decline) between a stage of not recognising a need for change (precontemplation) and ambivalence about change at present however an intention to change in the future (contemplation), whereas the AWS (accept) are positioned between a stage of ambivalence about change at present however an intention to change in the future (contemplation) and tangible and deliberate change at some level (action).

A comparison between the means showed that AWS (decline) demonstrated significantly higher scores on the precontemplation stage of readiness for change,  $t(34) = -4.64, p < .001$ ; significantly lower scores on the contemplation stage of readiness for change,  $t(34) = 3.86, p < .001$ ; significantly lower scores on the action stage of readiness for change,  $t(34) = 4.00, p < .001$ ; and significantly lower scores on the maintenance stage of readiness for change,  $t(34) = 3.21, p < .001$  compared to AWS (accept).

#### **4.4.5 Correlations Between Variables**

##### **4.4.5.1 AWS (Accept) and AWS (Decline)**

Pearson product moment correlations were computed to determine the relationship between each measure within each group. Table 4.3 and 4.4 represents the correlations for these study variables for both the AWS (accept) and AWS (decline) cohorts.

Table 4.3: Intercorrelations for AWS who Accepted the Group ( $N = 21$ )

Measures	% SS	OASES-SI	STAI-S	STAI-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	SOC (PRE)	SOC (CONT)	SOC (ACT)	SOC (MAIN)	AGE
% SS	-	.55**	.51*	.64**	.34	.48*	.31	.44*	.43*	.09	.05	.08	-.12	.18
OASES-SI		-	.59**	.59**	.67**	.63**	.04	.81**	.60**	-.05	.03	-.05	-.16	.36
STAI (state)			-	.81**	.57**	.41	.20	.62**	.45*	-.04	.04	.01	-.16	.44*
STAI (trait)				-	.42	.43	.20	.59**	.36	.35	.39	.40	.17	.49*
BFNE-II					-	.49*	.46*	.57**	.59**	-.32	-.02	-.10	-.11	.33
OASES-SII						-	.17	.82**	.92**	.19	.27	.08	.03	.16
SDQ							-	.20	.33	-.27	.05	.20	.26	-.05
OASES-SIII								-	.81**	-.06	.21	.04	-.03	.33
OASES-SIV									-	.04	.11	-.06	-.08	.18
SOC (PRE)										-	.39	.49*	.38	.21
SOC (CONT)											-	.82**	.76**	.29
SOC (ACT)												-	.92**	.11
SOC (MAIN)													-	.00
AGE														-

Note. \* $p < .05$ , \*\* $p < .01$ .

Table 4.4: Intercorrelations for AWS who Declined the Group ( $N = 15$ )

Measures	% SS	OASES-SI	STAI-S	STAI-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	SOC (PRE)	SOC (CONT)	SOC (ACT)	SOC (MAIN)	AGE
% SS	-	.27	.31	.56*	.21	.08	-.14	.09	-.07	.56*	-.10	-.19	-.55*	.80**
OASES-SI		-	.63*	.39	.76**	.57*	.36	.67*	.42	-.15	-.01	-.11	.17	.25
STAI (state)			-	.54*	.46	.38	.37	.35	.34	-.03	.09	.09	.32	.40
STAI (trait)				-	.33	.00	.22	-.05	-.32	.08	.19	-.03	-.02	.42
BFNE-II					-	.33	.46	.62*	.29	-.27	-.02	.23	.11	.13
OASES-SII						-	.16	.83**	.68**	-.01	-.13	-.38	.01	-.10
SDQ							-	.30	-.02	-.29	.17	.11	.13	.03
OASES-SIII								-	.76**	-.17	-.22	-.09	-.06	.07
OASES-SIV									-	-.35	-.17	.20	.19	.01
SOC (PRE)										-	-.28	-.63*	-.47	.47
SOC (CONT)											-	.32	.28	-.09
SOC (ACT)												-	.45	.02
SOC (MAIN)													-	-.41
AGE														-

Note. \* $p < .05$ , \*\* $p < .01$ .

### *Impairment in Body Function*

Within the group of AWS (accept), statistically significant correlations were obtained between severity of stuttering (%SS) and self-awareness and knowledge of stuttering (OASES-SI),  $r(19) = .55, p = .01$ .

### *Personal Factors/Reactions*

Within the AWS (accept) cohort, statistically significant associations were obtained between state and trait anxiety,  $r(19) = .81, p < .001$ ; state anxiety and fear of negative evaluation (BFNE-II),  $r(19) = .57, p < .01$ ; and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII),  $r(19) = .49, p = .03$ .

Within the AWS (decline) cohort, a statistically significant associations was obtained between state and trait anxiety),  $r(13) = .54, p = .04$ .

### *Impairment of Body Function and Personal Factors/Reactions*

Within the group of AWS (accept), statistically significant correlations were obtained between severity of stuttering (%SS) and state anxiety,  $r(19) = .51, p = .02$ ; severity of stuttering and trait anxiety,  $r(19) = .64, p < .01$ ; and severity of stuttering and reactions to stuttering (OASES-SII),  $r(19) = .48, p = .03$ . Statistically significant associations were obtained between self-awareness and knowledge of stuttering (OASES-SI) and state anxiety,  $r(19) = .59, p < .01$ ; self-awareness and knowledge of stuttering (OASES-SI) and trait anxiety,  $r(19) = .59, p < .01$ ; self-awareness and knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(19) = .67, p = .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and reactions to stuttering (OASES-SII),  $r(19) = .63, p < .01$ .

Within the group of AWS (decline), statistically significant relationships were obtained between severity of stuttering (%SS) and trait anxiety,  $r(13) = .56, p = .03$ ; self-awareness and knowledge of stuttering (OASES-SI) and state anxiety,  $r(13) = .63,$



$p = .01$ ; self-awareness and knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(13) = .76$ ,  $p = .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and reactions to stuttering (OASES-SII),  $r(13) = .57$ ,  $p = .03$ .

#### *Impairment in Body Function and Environmental Factors*

Adolescents who stutter (accept) displayed statistically significant relationships between severity of stuttering (%SS) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .44$ ,  $p = .05$ ; and self-awareness and knowledge of stuttering (OASES-SI) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .81$ ,  $p < .001$ .

Adolescents who stutter (decline) demonstrated statistically significant relationships between self-awareness and knowledge of stuttering (OASES-SI) and communication difficulties in daily situations (OASES-SIII),  $r(13) = .67$ ,  $p < .01$ .

#### *Impairment of Body Function and Activity Limitations / Participation Restriction*

Within the AWS (accept) cohort, statistically significant correlations were obtained between severity of stuttering (%SS) and quality of life (OASES-SIV),  $r(19) = .43$ ,  $p = .05$ ; and self-awareness and knowledge of stuttering (OASES-SI) and quality of life (OASES-SIV),  $r(19) = .60$ ,  $p < .01$ .

#### *Personal Factors / Reactions and Environmental Factors*

Adolescents who stutter (accept) demonstrated statistically significant associations between state anxiety and communication difficulties in daily situations (OASES-SIII),  $r(19) = .62$ ,  $p < .01$ ; trait anxiety and communication difficulties in daily situations (OASES-SIII),  $r(19) = .59$ ,  $p < .01$ ; fear of negative evaluation (BFNE-II) and behavioural and social difficulties (SDQ),  $r(19) = .46$ ,  $p = .04$ ; fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),

$r(19) = .57, p < .01$ ; and reactions to stuttering (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .82, p < .001$ .

Adolescents who stutter (decline) showed statistically significant associations between fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),  $r(13) = .62, p = .02$  and reactions to stuttering (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(13) = .82, p < .001$ .

#### *Personal Factors / Reactions and Activity Limitations / Participation Restriction*

Within the group of AWS (accept), statistically significant correlations were obtained between state anxiety and quality of life (OASES-SIV),  $r(19) = .45, p = .04$ ; fear of negative evaluation (BFNE-II) and quality of life (OASES-SIV),  $r(19) = .59, p < .01$ ; and reactions to stuttering (OASES-SII) and quality of life (OASES-SIV),  $r(13) = .92, p < .001$ .

Within the group of AWS (decline), statistically significant correlations were obtained between reactions to stuttering (OASES-SII) and quality of life (OASES-SIV),  $r(13) = .68, p < .01$ .

#### *Environmental Factors and Activity Limitations / Participation Restriction*

Within the cohort of AWS (accept), a statistically significant relationship was obtained between communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(19) = .81, p < .001$ .

Within the cohort of AWS (decline), a statistically significant relationship was obtained between communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(13) = .76, p = .001$ .

### *Stage of Change*

The stages of readiness for change were defined as precontemplation, contemplation, action and maintenance. Analysis of the AWS (accept) cohort demonstrated statistically significant associations between precontemplation and action,  $r(19) = .49, p = .02$ ; contemplation and action,  $r(19) = .82, p < .001$ ; contemplation and maintenance,  $r(19) = .76, p < .001$ ; and action and maintenance,  $r(19) = .92, p < .001$ .

Analysis of the AWS (decline) cohort demonstrated statistically significant associations between precontemplation and action,  $r(13) = -.63, p = .01$ ; and maintenance and severity of stuttering (%SS),  $r(13) = -.55, p = .04$ .

### *Age*

Adolescents who stutter (accept) demonstrated statistically significant positive correlations between Age and state anxiety,  $r(19) = .44, p = .05$ ; and trait anxiety,  $r(19) = .49, p = .03$ .

Adolescents who stutter (decline) demonstrated statistically significant correlations between Age and severity of stuttering (%SS),  $r(13) = .80, p < .001$ .

#### 4.4.6 Fisher r-to-z transformation

A Fisher *r*-to-*z* transformation was applied to the data to test for significant differences between the correlation coefficients obtained for each comparison within each group (Cohen & Cohen, 2003). Several statistically significant differences were found between the correlation coefficients as shown in Table 4.5.

##### *Personal Factors / Reactions and Environmental Factors*

Adolescents who stutter (accept) demonstrated a statistically significant stronger correlation between trait anxiety and communication difficulties in daily situations (OASES-SIII) compared to adolescents who stutter (decline),  $z = 1.95, p = .05$ .

##### *Personal Factors / Reactions and Quality of Life*

Adolescents who stutter (accept) demonstrated a statistically significant stronger association between reactions to stuttering (OASES-SII) and quality of life (OASES-SIV) compared to AWS (decline),  $z = 2.04, p = .04$ .

##### *Age and %SS*

Adolescents who stutter (decline) demonstrated a statistically significant stronger relationship between Age and severity of stuttering (%SS) compared to adolescents who stutter (accept),  $z = -2.46, p = .01$ .

Table 4.5: Correlations Between Variables in AWS (Accept) and AWS (Decline)

Measures	Correlation Coefficient		z	P value (2-tailed)
	AWS ACCEPT	AWS DECLINE		
Impairment				
% SS vs OASES-SI	.55**	.27	.92	.36
Personal				
STAI (state) vs STAI (trait)	.81**	.54*	1.40	.16
STAI (state) vs BFNE-II	.57**	.46	.40	.69
STAI (trait) vs BFNE-II	.42	.33	.28	.78
STAI (state) vs OASES-SII	.41	.38	.10	.92
STAI (trait) vs OASES-SII	.43	-.00	1.23	.22
BFNE-II vs OASES-SII	.49*	.33	.52	.60
Environmental				
SDQ vs OASES-SIII	.20	.30	-.29	.77
Impairment vs Personal				
OASES-SI vs STAI (state)	.59**	.63*	-.17	.87
OASES-SI vs STAI (trait)	.59**	.39	.71	.48
OASES-SI vs BFNE-II	.67**	.76**	-.50	.62
OASES-SI vs OASES-SII	.63**	.57*	.25	.80
Impairment vs Environmental				
OASES-SI vs SDQ	.04	.36	-.90	.37
OASES-SI vs OASES-SIII	.81**	.67*	.85	.40
Impairment vs QoL				
OASES-SI vs OASES-SIV	.60**	.42	.66	.51
Personal vs Environmental				
STAI (state) vs SDQ	.20	.37	-.50	.62
STAI (trait) vs SDQ	.20	.22	-.06	.95
BFNE-II vs SDQ	.46*	.46	.00	1.00
OASES-SII vs SDQ	.17	.16	.03	.98
STAI (state) vs OASES-SIII	.62**	.35	.96	.34
STAI (trait) vs OASES-SIII	.59**	-.05	1.95	.05
BFNE-II vs OASES-SIII	.57**	.62*	-.21	.83
OASES-SII vs OASES-SIII	.82**	.82**	.00	1.00
Personal vs QoL				
STAI (state) vs OASES-SIV	.45*	.34	.35	.73
STAI (trait) vs OASES-SIV	.36	-.32	1.90	.06
BFNE-II vs OASES-SIV	.59**	.29	1.02	.31
OASES-SII vs OASES-SIV	.92**	.68**	2.04	.04
Environmental vs QoL				
SDQ vs OASES-SIV	.33	-.02	.97	.33
OASES-SIII vs OASES-SIV	.81**	.76**	.73	.47
Age vs %SS	.18	.80**	-2.46	.01

## **4.5 DISCUSSION**

In light of the emergent qualitative themes, the statistically significant quantitative findings and the complex relationships and interactions between various psychosocial variables, several barriers which precluded adolescents from therapy were identified.

The qualitative and quantitative information derived from the adolescents who stutter who declined therapy participation and the adolescents who accepted and participated in therapy provides support for a holistic multi-factorial approach to assessing, connecting with and treating adolescents who stutter.

### **4.5.1 Qualitative**

This study used a phenomenological approach to capture and identify as closely as possible recurrent themes within the data set reported by adolescents regarding the types of barriers they articulated precluded them from accessing the Fluency & Confidence group program. The analyses of the interview transcripts yielded a range of recurrent themes that were positioned within the components of the framework of the Yaruss and Quesal (2004) model.

All fifteen of the adolescents who declined participation in the Fluency & Confidence group program gave clear insights regarding the types of barriers they experienced. The clusters and categories of themes describe a combination of impairment in body function, personal, environmental, and quality of life factors present in the transcripts and provide a context for the barriers experienced by the adolescents who stutter.

The following section discusses the theoretical and practical implications of these qualitative finding using the Yaruss and Quesal (2004) model components as a framework. Each documented theme was positioned within the various components of the holistic biopsychosocial model by Yaruss and Quesal (2004). The various qualitative themes within each biopsychosocial component (Impairment in Body

Function, Personal Reactions/Factors, Environmental Factors, and Quality of Life) will be reviewed and discussed.

#### 4.5.1.1 Impairment in Body Function

The most common theme of *Impairment in Body Function* was the limited knowledge and self-awareness that the adolescents possessed about their stuttering behaviour and experience with the majority (80%) of AWS (decline) in this study reporting flawed knowledge about the causes and current therapy programs available for stuttering.

Some adolescents reported that stuttering had a “nervous” or “emotional basis” or that it was caused by “speaking too quickly” or as the result of “something in their head or throat”. With extensive literature available regarding the causes and treatments of stuttering, the lack of accurate knowledge possessed by the adolescents highlights an important failing in the current health education of these young people.

Several of the adolescents reported that their stuttering was too severe for change or modification. With stuttering construed by the adolescents to be beyond remediation, the adolescents believed that no treatment program would be deemed to be helpful. In these instances the adolescents appear to be utilizing avoidance, denial, and passive coping strategies such as creative hopelessness which evolve into further refined and sophisticated avoidant techniques which position the adolescent further from accessing therapy.

Other adolescents believed that weaknesses such as learning difficulties would make it impossible for them to also engage and succeed in other areas of learning such as the Fluency & Confidence group program offered. A sense of hopelessness by the adolescents eroded motivation to work on their stuttered speech and it also undermined any enthusiasm they might have for future therapeutic assistance.

In addressing complex contributions undermining therapy, Lambert (1992) concluded that extra-therapeutic client factors accounted for approximately 40% of the variance in therapeutic outcome. These factors included the client's personal strengths, talents, resources, beliefs, support system, spontaneous remission, abilities, and faith. Further, expectancy factors accounted for approximately 15% of the variance in therapeutic outcome and refer to the client's hope and expectancy of change as a result of participating in therapy. Lambert (1992) argues that the client and their expectations constitute therapeutic change. Therefore when the adolescents were limited in the extra-therapeutic factors they were capable of contributing to the therapeutic process in terms of their hopelessness and their lack of desire to participate in the therapeutic program, these limitations had a very important impact on whether or not the treatment would be effective for these adolescents. Therefore it should be a major goal of the clinician and treatment program to engage and support the adolescents and assist in empowering them to believe and participate in the treatment provided.

#### 4.5.1.2 Personal Factors / Reactions

The most common *Personal* barrier explaining non-participation in the Fluency & Confidence group program was experiential avoidance and feelings of fear and embarrassment at the prospect of group attendance.

The majority (80%) of AWS (decline) reported honing their expert skills at situational avoidance including those involving public speaking in particular. The adolescents were fearful that the group treatment program would involve speaking in front of others. The adolescents described how the avoidance strategies provided them with a feeling of control over the stressful situations, a method of hiding their stuttering behaviour from listeners, and a way of distancing themselves from their stuttering disorder. The adolescents described the relief that they felt when using the different



methods of experiential avoidance, however, they reflected that over time the effectiveness of these experiential avoidance methods had lessened, and they did not currently possess effective coping techniques or strategies to assist them in these difficult situations. Two thirds of the AWS (decline) reported negative emotions and feelings associated with their stuttering behaviour and the prospect of attending group therapy. The range of emotions included embarrassment, frustration, sadness and anger when reflecting on the stuttering experience and in addition, the majority described the repression of any negative emotions experienced.

Over half of the young people interviewed reported the belief that their stuttering was too severe for change or modification. Previous therapy had engendered a tone of resignation to their speech predicament. One third of the AWS (decline) reported statements consistent with cognitive fusion and self-criticism. These statements were predominantly self-critical and self-loathing in nature and these unhelpful thought processes caused the adolescents to become withdrawn and disengaged thus limiting their family relationships or friendship opportunities.

Another sub-set of AWS (decline) attempted to minimise the serious nature of their stutter and the effects on their interpersonal relationships with others. By contrast, the parents of the non-participants were keenly aware of the implications and limitations their children's stutters imposed and it was this awareness of the distress that their child was experiencing that originally promoted the parent's referral to this specialist group therapy program.

#### 4.5.1.3 Environmental Factors

The most common *Environmental* barrier was fear of the social aspects of the group and fear of being judged in the group environment by other participants.

Over 70% of AWS (decline) were worried that group therapy would exacerbate their anxiety, fear, embarrassment, and overall discomfort toward their speech. The teenagers highlighted the possibility of being ridiculed and teased and the negative labelling of belonging to a group with a perceived disability. These adolescents held many anxieties and concerns about the potential experiences they would have in the group treatment program and declared that they would find it difficult to actively participate in group therapy. Over half of the AWS (decline) reported never having met another individual who stuttered and believed that being in a group with other people who stutter would be uncomfortable.

There was also concern expressed that an exacerbation of stuttering would take place when immersed in a group where all members were struggling with their speech. Adolescents also perceived the group therapy program as a less helpful form of treatment than individual therapy because of their belief that there would be generic application of techniques which would work along the lines of 'one size fits all'.

#### 4.5.1.4 Quality of Life

Two thirds of the AWS (decline) believed that the group program would further impact on the quality of their lives by disturbing the amount and type of control they wielded over their speech and emotional difficulties. The adolescents reported that they became experts at avoiding activities such as speaking in public and believed that the group treatment program would adversely impact on their ability to control their environments and force them to confront previously limited speaking activities. These reflections by the adolescents gave some insight into how adversely their quality of life has become as a consequence of their stuttering disorder.

#### 4.5.1.5 Previous Negative Experiences with Therapy Research

Two adolescents who stuttered reflected poignantly that they decided not to participate in the treatment program based on their previous experiences with treatment and more specifically with research treatment programs.

It is important to note that half of the AWS (decline) demonstrated personal signs of *creative hopelessness* in which they believed that due to previous unsuccessful therapy experiences that they were beyond constructive help. The challenge is to be proactive and re-establish therapeutic alliance with these individuals. It is frequently reported in the literature that a “lack of motivation has been reported as a characteristic of adolescents” (Hearne, Packman, Onslow, & Quine, 2008). However, motivation per se may not be the crucial factor – rather the myriad and complex barriers reported thus far may underpin this perceived lack of cooperation on the young person’s part.

### 4.5.2 Quantitative

Quantitative data obtained from the 36 AWS who completed the set of questionnaires during the Wait-List phase (Chapter 3) were divided into two groups: i) adolescents who accepted and participated in the F & C group program (AWS Accept,  $N = 21$ ) and ii) adolescents who chose to decline the F & C program (AWS Decline,  $N = 15$ ). The group data was examined to ascertain any trends or distinctions between these two adolescent cohorts.

#### 4.5.2.1 Age Differences

There was a statistically significant age differences between the AWS (decline) and AWS (accept) cohorts. The age range of the AWS (decline) was an older cohort of 14 – 17 years of age whereas the age range of the AWS (accept) was a younger cohort of 12 – 14 years of age. These results support the general consensus that as adolescents

become older and develop more independence and autonomy, it is difficult to attract them to treatment programs (Manning, 2010; Zebrowski, 2002). It is clear from these results that variations in approaches are warranted for attracting adolescents into therapy.

#### 4.5.2.2 Impairment in Body Function

Percentage Syllables Stuttered (%SS) and self-awareness and knowledge of stuttering experience (OASES-SI) were chosen to reflect the impairment in body function component of the Yaruss and Quesal (2004) model for the adolescents.

The mean severity of stuttering (%SS) was higher for the AWS (decline) compared to the AWS (accept). Sixty percent of the AWS (decline) were assessed with a severe stutter compared to only 33% of the AWS (accept). This population of older adolescents with greater disability were sadly choosing not to engage in a potentially beneficial treatment program. The AWS (decline) cohort also demonstrated an increased self-awareness and knowledge of their stuttering experience. Interestingly, this finding further supports the premise that adolescents with a higher severity of stuttering appear to possess more self-awareness and increased knowledge regarding their stuttered speech.

Parental reports have frequently indicated that children who stutter are aware of their stuttering shortly after its onset, which has the potential to affect social interaction from an early age (Ambrose & Yairi, 1994; Packman et al., 2003). Each adolescent assessed in this study had formerly been provided with speech pathology therapy but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore it is plausible that adolescents who continue to stutter despite previous unsuccessful treatment develop a strong interactive relationship with self-awareness and knowledge of their stuttering experience.

It has been stated in the literature that overt stuttering behaviours often does not constitute the most important factor for people who stutter (Manning, 2001; Shapiro, 1999; Yaruss et al., 2002). It has been reported that most individuals experience a myriad of negative consequences associated with the speech disorder and these consequences can be described in terms of personal factors/reactions, environmental factors and quality of life (Yaruss and Quesal, 2004; 2006).

#### 4.5.2.3 Personal Factors / Reactions

AWS (decline) displayed higher state and trait anxiety (STAI), social anxiety (BFNE-II), and reactions to stuttering (OASES-SII) than AWS (accept), although these difference were not statistically significant. The levels of each of these personal factors/reactions were above published normal clinical limits and yet each of the AWS (decline) decided not to accept the invitation to attend the treatment program.

All AWS (decline) were originally referred by clinicians and parents to the innovative specialised holistic biopsychosocial program specifically run by the Curtin University Stuttering Treatment Clinic for assistance with their stuttering behaviour. Each of the 36 adolescents who stutter had been provided with speech pathology therapy intervention in the past but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Considering this previous lack of success and the enduring nature of the personal reactions to their stutter, these fifteen young people who chose not to take up the opportunities offered in the Fluency & Confidence group program, at the time of this study, remained disengage from therapeutic assistance.

The findings in this study, contribute to an informative and important developmental period for young people who stutter. The highlighted personal barriers to treatment advocate the need for clinicians to provide more appropriate multi-factorial

treatment programs for older adolescents in need which are eclectic and sensitive to the specific needs of this vulnerable population.

#### 4.5.2.4 Environmental Factors

The AWS (decline) group displayed higher behavioural, social and communication difficulties than AWS (accept), although these difference were not statistically significant. The levels of each of these environmental factors were above published normal clinical limits, yet, despite these concerning results, the AWS (decline) group declined the Fluency & Confidence treatment program. The adolescents reflected that the prospect of attending a group in which they would lose the rigid control they were able to maintain over their environment was too overwhelming and frightening.

Such quantitative findings in this study further support the qualitative findings that older AWS who declined the treatment program engage in experiential avoidance. The quantitative data demonstrated that these AWS avoid stressful environments which involve important and necessary communication scenarios. The AWS (decline) cohort described qualitatively how these avoidance strategies provided them with a feeling of control over these stressful situations. They also provide a method of concealing their stuttering behaviour from the listener, and a mechanism for distancing themselves from the distress and confrontation of their stuttering disorder. In reality, the usefulness of these experiential avoidance methods will wane because stuttering as a chronic stressor does not recede as a result of such avoidance.

#### 4.5.2.5 Quality of Life (OASES-SIV)

In this study the impact of stuttering on the adolescent's quality of life was measured by OASES-SIV and the AWS (decline) group displayed poorer quality of life

than the AWS (accept) group, although again these differences were not significant. Such levels obtained for each of the quality of life factors were above normal clinical limits and yet still each of the AWS (decline) decided not to commit to the treatment program. It is evident from the results presented that the long-term stuttering experience produces a profound negative emotional, behavioural and cognitive impact on the adolescents' overall quality of life. At such a formative time in their social and emotional development together with the increased demands on the adolescents to interface with society at large, these young people are suffering and isolate themselves further from appropriate assistance.

#### 4.5.2.6 Stage of Change

The two groups of adolescents were evaluated for their *Stages of Readiness for Change* in terms of their readiness for help and intervention. They were assessed using the Stage of Change questionnaire (Floyd et al., 2007). A comparison between the means showed that AWS (decline) demonstrated significantly higher scores on the precontemplation stage of readiness for change, significantly lower scores on the contemplation stage of readiness for change, significantly lower scores on the action stage of readiness for change, and significantly lower scores on the maintenance stage of readiness for change compared to AWS (accept).

The mean scores obtained demonstrated that the majority of the AWS (decline) cohort were positioned between the 'precontemplation' and 'contemplation' stage of readiness for change, whereas the AWS (accept) cohort were positioned between the 'contemplation' and 'action' stage of readiness for change (Floyd et al., 2007). This results therapeutically positions the AWS (decline) cohort between a stage of not recognising a need for change (precontemplation) and ambivalence about change at present however an intention to change in the future (contemplation), whereas the AWS

(accept) cohort are positioned between a stage of ambivalence about change at present however an intention to change in the future (contemplation) and tangible and deliberate change at some level (action).

Such crucial distinctions between the AWS (decline) and AWS (accept) groups were statistically significant and reflected a powerful clinical guideline for professionals poised to commence investment and therapeutic assistance for young people.

#### 4.5.2.7 Relationships Between AWS (Decline) and AWS (Accept) Cohorts

The comparison between AWS (decline) and AWS (accept) demonstrated statistically significant differences in the relationships for the following three combinations of variables: trait anxiety and communication difficulties in daily situations (OASES-SIII); reactions to stuttering (OASES-SII) and quality of life (OASES-SIV); and age and severity of stuttering (%SS).

In AWS (accept), trait anxiety was statistically significantly and positively correlated with communication difficulties in daily situations (OASES-SIII) compared to no relationship documented in AWS (decline). This positive relationship between trait anxiety and communication difficulties in daily situations indicates that the AWS (accept) cohort who accepted the group treatment program reported a statistically stronger positive association between these two psychosocial variables compared to the AWS (decline) cohort.

Considering the results documented in Chapter 3, and those of Mulcahy et al. (2008), who also demonstrated a statistically significant relationships between trait anxiety and communication difficulties in adolescents who stutter, it is again possible to conclude that trait anxiety may play a particularly significant developmental role in stuttering. This positive relationship between trait anxiety and communication difficulties, which was not found in children who stutter (Chapter 3), supports an



association between communication difficulties and intrinsic anxiety levels amongst adolescents who stutter. In this case, the AWS in whom this relationship was demonstrated was the adolescents who ultimately accepted and participated in the group therapy program in contrast to the adolescents who declined participation in the group program. This difference between these two adolescent cohorts may provide therapeutic insight into psychosocial differences between adolescents who accept and decline therapy.

In AWS (accept), reactions to stuttering (OASES-SII) was statistically significantly and positively correlated with quality of life (OASES-SIV) compared to a weaker statistically significant relationship documented in AWS (decline). The results obtained in this study support the premise that both AWS (accept) and AWS (decline) are experiencing statistically significant affective, behavioural and cognitive distress and reactions concerning their speaking abilities which have a strong relationship with their quality of life. However, the results further posit that the AWS (accept) cohort demonstrate a statistically significant stronger positive relationship between these two psychosocial variables compared to the AWS (decline) cohort.

It has been noted in the literature that adolescents who stutter experience a variety of emotional reactions to their stuttering (e.g., Cooper, 1993; DeNil & Brutton, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutton, 1996; 1997; Watson, 1988; Yaruss, 1998; Yaruss & Quesal, 2004, 2006) and the current study endorses this claim. Further, in this study, these emotional reactions appear to pose particular quality of life challenges for these adolescents who stutter and they do not appear to possess the necessary coping skills for managing these strong emotions. In this case, the AWS (accept) cohort demonstrated a statistically significant stronger positive relationship compared to the AWS (decline) cohort, therefore this documented difference in this study between these two adolescent

cohorts may provide therapeutic insight into psychosocial differences between adolescents who accept and decline therapy.

Finally, AWS (decline) demonstrated a statistically significantly and positively correlation between age and severity of stuttering (%SS) compared to no statistically significant relationship documented in AWS (accept). This finding is not surprising considering that as children become older their stuttering behaviours may become more severe and ingrained as a consequence of previous unsuccessful treatment. It has been reported by researchers investigating the impact of the stuttering disorder on quality of life in adults who stutter that these findings have important therapeutic implications for the treatment of children who stutter (Craig et al., 2009). Given the finding in this study, it is vital that treatments for adolescents improve and incorporate a more holistic therapeutic approach. It is important that these adolescents do not still stutter at elevated or severe levels as adults because they have rejected and declined treatment. This population of older adolescents with greater stuttering severity were sadly choosing not to engage in a potentially beneficial treatment program.

#### **4.5.3 Clinical Management of Adolescents who Stutter**

An important goal of this qualitative and quantitative study was to develop a range of themes and psychosocial variables which could be positioned within the Yaruss and Quesal (2004) model and provide increased knowledge of the idiosyncratic barrier decisions of adolescents who stutter. Qualitatively, a depth and authenticity of themes have been confidently demonstrated in that saturation of themes was reached within this study. Quantitative analysis was carried out to determine any significant differences in relation to the barriers to treatment, between adolescents who accepted and participated in the group treatment program compared to adolescents who declined treatment. This quantitative analysis demonstrated that several differences existed

between these two adolescent cohorts with respect to some of the psychosocial variables measured. Further quantitative analysis demonstrated that significant differences between the inter-relationships between anxiety, psychosocial variables and stuttering severity existed between these two adolescent cohorts.

The strength of these qualitative and quantitative findings and the resultant clinical implications highlighted the need to provide a modified version of the Fluency & Confidence and Investing in Parents group treatment program. A revised version has now been devised for adolescents and their parents incorporating the addition of a 4 week ‘preparation for change’ treatment phase in which the adolescents and their parents are seen individually prior to commencing the group programs. The purpose of this ‘preparation for change’ treatment phase is to address and support the barriers that have been identified and described in this study. A detailed description of this revised program is beyond the scope of this thesis; however, the new flexible version has enabled continued engagement with the previously disengaged adolescents detailed in this thesis. It is neither acceptable nor ethical to abandon adolescents due to “recruitment difficulties” as others have chosen to do (Huber, Packman, Quine, Onslow, & Simpson, 2004). By contrast, tailoring an improved holistic approach for the vulnerable in our clinical population is the standard to which to aspire.

#### **4.5.4 Limitations and Future Directions**

There are a number of specific limitations to this qualitative and quantitative study which may restrict the conclusions that can be drawn. A discussion of the limitations and future research directions are provided below

#### 4.5.4.1 Self-Report Data Collection

As mentioned in the previous study documented in Chapter 3, self-report measures were used to assess the various psychosocial variables under investigation. This form of quantitative measurement presents a number of issues, including the operation of response bias and shared variance between the measures. In reality, however, self-report methods are currently one of few available methodologies for the collection of subjective data and questionnaires are widely accepted as valid and reliable (Turk & Melzack, 1992).

In this research study a qualitative research method was used in an attempt to verify, cross-validate and expand the self-report responses of the adolescents who stutter who declined treatment. Future research studies may incorporate qualitative interviews of parents or significant others such as siblings into the research evaluation process.

#### 4.5.4.2 Qualitative Research Methods

The conclusions drawn from this study were partially based on qualitative interviews with 15 adolescents who stutter and these adolescents may not be representative of the adolescents stuttering population generally. Specifically these 15 adolescents were representative of a sub-set of adolescents who decline participation in treatment, however, a depth of authenticity of themes were demonstrated for this adolescent cohort in that saturation of themes was reached within the study.

Established guidelines for ensuring methodological and interpretive rigor in qualitative research was followed in this study, however there is an element of interpretation inherent to qualitative research. The use of additional independent ‘blind’ researchers for the collection and analysis of data may have enhanced the validity of the results, however, this was not possible as part of this thesis process.

Future research studies which quantify and validate the findings reported in this study, and assess the effectiveness of a treatment program targeting the barriers and challenges reported by the adolescents who declined the treatment program, would be beneficial.

#### 4.5.4.3 Cross-sectional Analysis

This study is cross-sectional in nature, and therefore it is not possible to make causal attributions about the nature of the relationships between the stuttering disorder, anxiety and psychosocial variables in these children and adolescents who stutter. In addition, the qualitative data was obtained from one interview and therefore represents the perceptions of the adolescents regarding barrier to treatment at one time-point in their lives. Longitudinal studies of children and adolescents who stutter are essential to gain a better understanding of those factors that are prognostic in long-term adjustment to both stuttering itself and to the impact of stuttering on other biopsychosocial areas of the child or adolescent's life.

#### 4.5.4.4 Age Differences AWS (Accept) and AWS (Decline)

It is reasonable to assume that more autonomy and independent choice was afforded the older cohort in terms of choosing to attend or not attend therapy. It may be that the parents of the younger adolescents did not give them the option of deciding whether or not they attended the group program. Therefore, the inclusion of qualitative interviews with the parents of the adolescents who declined the group program may have also provided further insights to the barriers for adolescents of treatment programs. Future research could potentially demonstrate homogeneity or heterogeneity between adolescents who stutter and their parents with such qualitative information.

#### 4.5.4.5 Adolescent Cohorts

As mentioned previously, the sample of adolescents who stutter is a very specific sub-set of young people who stutter, given that they were drawn from the Wait-List for an innovative specialised biopsychosocial Fluency & Confidence treatment program specifically run by the Curtin University Stuttering Treatment Clinic. Thus the findings cannot be generalised of all children and adolescents who stutter living in the community. However, these two cohorts of adolescents documented in this thesis may be considered to be indicative of what may be expected amongst adolescents who stutter presenting for treatment that had previously been provided with speech pathology therapy interventions which had been deemed by either the clinician or parents not to have achieved significant improvement or success.

It is important that future research studies with larger heterogeneous populations of adolescents who stutter replicate the assessment and treatment studies documented in this thesis. Replication of this study using a larger population of adolescents who decline and accept treatment would enable investigation of the strength and universality of the findings and relationships documented in this study. It is hoped that future studies will investigate and provide empirical support for a biopsychosocial approach to the assessment, engagement and treatment of children and adolescents who stutter.

#### 4.5.4.6 Replication of Findings

While the results offer some suggestions about important relationships which may become targets for more effective treatments for adolescents who stutter, the uniqueness of this study and its findings necessitates that other researchers and further studies replicate these findings in an increased number of adolescents who stutter. Further research in AWS who decline treatment is needed to assess whether the biopsychosocial themes reported in this study can be generalised to other AWS who decline treatment.

In addition, based on the findings described in this Chapter 4, it may be important to investigate the relationship between the stages of readiness for change and other psychosocial variables in more detail. This exploration may assist in the development of supportive therapeutic formats that progress the state of readiness for change of the adolescents from the ‘precontemplation’ stage of readiness for change to the ‘action’ stage.

#### 4.5.4.7 Biopsychosocial Theories, Models and Supportive Data

The biopsychosocial model (Yaruss and Quesal, 2004) and OASES questionnaire (Yaruss and Quesal, 2006, 2008) which are referred to and used extensively in this thesis were developed to assist clinical researcher to assess, document and treat the impact and consequences of stuttering in children, adolescents and adults. The mandate set by these clinical researchers was the need to empirically document the comprehensive assessment and treatment of children and adolescents who stutter using a biopsychosocial framework (Yaruss, Pelczarski, & Quesal, 2010, p.241). The primary goal of this study was to provide further documentation of the biopsychosocial practice of assessment of children and adolescents who stutter. The body of research described in this study used quantitative and qualitative techniques to explore biopsychosocial issues pertinent to childhood and adolescent stuttering experiences and barriers to treatment. This new information will then be used to successfully expand the knowledge base of biopsychosocial effectiveness based treatments for children and adolescents who stutter (Chapter 6).

## 4.6 Chapter Summary

This is the first study to examine barriers to commitment to therapy for adolescents who stutter. A phenomenological thematic analysis was used to examine adolescent responses to reasons for non-participation in a group therapy program. Such

identified variables underpinning the non-participation were further captured, positioned onto and supported through the biopsychosocial components of the Yaruss and Quesal (2004) model.

The most common theme of the *Impairment in Body Function* barrier was the limited knowledge and self-awareness that the adolescents reported about their stuttering behaviour and experience. The most common *Personal* barrier was experiential avoidance and feelings of fear and embarrassment at the prospect of group attendance. The most frequent *Environmental* barrier was fear of the social aspects of the group and fear of being judged in the group environment by other participants. The most central *Quality of Life* barrier was the belief by the adolescents who stutter that the group program would further impact on their controlled quality of life by disturbing the amount and type of control they could exercise over their speech and emotional difficulties. Finally, quantitatively, the clinical implications of the *Stage of Change* hurdles reported by the adolescents were defining and distinctive clinical messages and an area therapeutically where clinicians can assess and incorporate the stages of the readiness of change of their client into their treatment programs.



## **5.0 CHAPTER 5: WAIT-LIST VS PRE-GROUP CWS & AWS (ACCEPTED)**

In Chapter 3 the relationship between several psychosocial variables and stuttering severity in children and adolescents who stutter was investigated. The context selected for exploration of this relationship was in children and adolescents who stuttered (8 – 17 years of age), who had been placed on a Fluency & Confidence group program Wait-List because previous speech pathology therapeutic gains for the treatment of their stuttering had been deemed unsuccessful. Each child and adolescent participant was referred to the Curtin University Stuttering Treatment Clinic by community based speech pathologists and parents for an alternative holistic approach to treatment.

Between the Wait-List phase and Pre-Group phase, 15 of the 36 adolescents declined the invitation to participate in the group treatment program. In Chapter 4, details of a study which explored the barriers to acceptance and participation in the holistic biopsychosocial Fluency & Confidence group treatment program were discussed.

This study reported in Chapter 5 details a comparison between scores obtained for several psychosocial variables and stuttering severity 8 weeks prior to therapy commencement (Wait-List) and those repeated at the commencement of therapy (Pre-Group). This current study investigates whether the results obtained from 60 children and adolescents who stutter on these psychosocial variables and severity of stuttering remain at levels of clinical concern just prior to entering the Fluency & Confidence group therapy program.

### **5.1 STUDY AIM AND HYPOTHESES**

The study details four areas of investigation in children and adolescents who stutter prior to commencing the Fluency & Confidence group therapy program: i) The

difference for CWS and AWS at Wait-List compared to Pre-Group (8 weeks later) on a range of psychosocial variables (state anxiety, trait anxiety, social anxiety, behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering, communication difficulties in daily situations, and quality of life); ii) The relationship between these psychosocial variables and stuttering severity in CWS and AWS at Wait-List compared to Pre-Group; iii) Whether any significant differences exist between CWS and AWS when measuring the relationships between these psychosocial variables and stuttering severity at Wait-List compared to Pre-Group; and finally, iv) The factor structures of the various psychosocial variables measured at Wait-List compared to Pre-Group.

Firstly, the possibility of a significant difference between CWS and AWS at Wait-List compared to Pre-Group time-points on a range of psychosocial variables was explored. Variables based on the biopsychosocial model (Yaruss & Quesal, 2004) as a framework include: state anxiety, trait anxiety, social anxiety, behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering, communication difficulties in daily situations, and quality of life. Given the data detailed in Chapter 3, it was posited that CWS and AWS would demonstrate constant and stable dysfunctional levels of anxiety, social anxiety, behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering, communication difficulties in daily situations and quality of life over the 8 week period.

Secondly, this study explored the relationship between these psychosocial variables and stuttering severity for CWS and AWS using the biopsychosocial model (Yaruss & Quesal, 2004) as a framework. Further exploration addressed which psychosocial variables, if any, were predictors of stuttered speech severity in these populations. Based on the results obtained in Chapter 3, it was hypothesised that CWS

and AWS would demonstrate consistent relationships between psychosocial variables and their stuttered speech severity over the 8 week period.

Thirdly, this study explored the developmental differences between CWS and AWS at these time-points. The assumption was that given the data presented in Chapter 3 and the impact and distress of experiencing stuttering for a longer period of time, the AWS would continue to demonstrate greater statistically significant associations between some of these psychosocial variables and their stuttered speech severity.

Finally, the study detailed in this Chapter 5 aimed to explore the factor or component structure of the various psychosocial variables measured using the biopsychosocial model (Yaruss & Quesal, 2004) as a framework. Based on the research and theory proposed by Yaruss and Quesal (2004; 2006), and the data presented in Chapter 3, it was posited that a comparable factor structure would be demonstrated 8 weeks later and would support the proposed Yaruss and Quesal (2004) model.

## **5.2 METHODS**

### **5.2.1 Participants**

Thirty-nine children (8 -11 years) and 21 adolescents (12-15 years) who stutter commenced the Fluency & Confidence (F & C) group program. Each participant was assessed 8 weeks prior to the commencement of the F & C group program (Wait-List; Chapter 3) and at the beginning of the F & C group program (Pre-Group).

### **5.2.2 Measures**

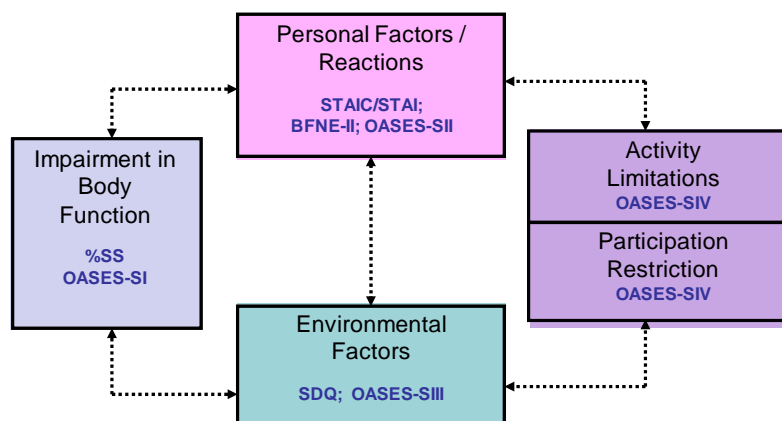
Each child and adolescent who stuttered completed the same set of questionnaires and speech assessments that they had completed as part of the Wait-List Group protocol (Chapter 3). The detailed information regarding these questionnaires is provided in Chapter 3.

### 5.2.3 Procedure

The Curtin University of Technology Human Research Ethics Committee granted ethical approval to conduct this research. Each participant was assessed 8 weeks prior to the commencement of the F & C group program (Wait-List) and at the beginning of the F & C group program (Pre-Group). Participants were assessed individually in a quiet room at the Curtin University Stuttering Treatment Clinic. A 15 minute recorded conversation sample (based on a series of open-ended questions designed to elicit language and establish rapport) was obtained for all participants and was digitally recorded. All participants were asked to complete the STAIC (8-11 years of age) or STAI (12 – 17 years of age), BFNE-II, SDQ, OASES, and SOC (12-17 years of age) questionnaires. The order of presentation of questionnaires was counterbalanced to control for order effects.

### 5.3 RESULTS:

The relevant components of the biopsychosocial model (Yaruss and Quesal, 2004) have been reproduced in designated sections of results section. As appropriate, the assessments and questionnaires used have been superimposed onto the Yaruss and Quesal (2004) model sub-components (Figure 5.1).



**Figure 5.1:** Sub-components of the Yaruss & Quesal (2004) model with psychosocial measures superimposed.

Consistent with the Yaruss and Quesal (2004; 2006) model which depicts how the stuttering disorder can be viewed in terms of several interacting components, the sub-sections of the OASES were mapped onto the various model sub-components. The State and Trait Anxiety Inventory (STAIC & STAI) and Brief Fear of Negative Evaluation (BFNE-II) questionnaires were mapped onto the Personal Factors/ Reactions model sub-component as these questionnaire measure psychological constructs. Finally, the Strengths and Difficulties questionnaire (SDQ) which measures behavioural and social difficulties in the family and school environmental setting was mapped onto the Environmental Factors model sub-component.

In addition, Tables presented within the results section will be articulated and highlighted with colour-coding. Blue, pink, green and purple represent psychosocial measures related to Impairment in Body Function, Personal Factors/Reactions, Environmental Factors and Quality of Life. Although not specifically a part of the Yaruss and Quesal (2004) model, yellow will represent results obtained from the Stage of Change measure provided to the adolescents in this study.

### **5.3.1 Descriptive Data Analysis**

The data was scanned for any univariate and multivariate outliers with no significant outliers identified. Mahalanobis distances were computed to identify any multivariate outliers with no significant outliers found. Descriptive statistics were computed for the %SS, STAIC (state and trait), STAI (state and trait), BFNE-II, SDQ and OASES (Sections I, II, III & IV), SOC (precontemplation, contemplation, action & maintenance), and Age, and are summarised in Tables 5.1 and 5.2. Effect size was calculated using Cohen's *d* (Cohen, 1988).

Table 5.1: Means and Standard Deviations for CWS (Wait-List) and CWS (Pre-Group) ( $N = 39$ )

Measures	CWS (Wait-List)		CWS (Pre-Group)		<i>p</i> value	Effect size
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<b><i>Impairment</i></b>						
% SS	4.66	2.49	4.47	2.46	<.05	.08
OASES-SI	57.05	7.56	57.82	8.28	<.05	.10
<b><i>Personal</i></b>						
STAIC (state)	45.15	4.79	47.18	3.86	<.001	.47
STAIC (trait)	47.38	5.56	47.28	5.79	.32	.02
BFNE-II	42.21	5.30	43.38	5.02	<.01	.23
OASES-SII	59.11	9.51	59.93	9.99	<.01	.08
<b><i>Environmental</i></b>						
SDQ	12.85	2.31	13.85	2.56	<.001	.41
OASES-SIII	63.14	10.69	64.10	11.17	<.01	.09
<b><i>Quality of Life</i></b>						
OASES-SIV	56.21	11.08	56.94	11.21	<.01	.07
<b>Age</b>	9.64	1.06	9.82	1.05	<.01	.17

### 5.3.2 Between Group Comparisons

#### 5.3.2.1 Children

The paired samples *t*-test showed a significant difference between the ages of CWS (Wait-List) and CWS (Pre-Group),  $t(38) = -2.88, p < .01$ .

Mean scores obtained on the STAIC, BFNE-II, and SDQ questionnaires from CWS (Wait-List) and CWS (Pre-Group) were compared to published normative data reported in the literature (Spielberger, 1973; Carleton et al., 2007; Mellor, 2005). The mean scores obtained on the OASES questionnaire were compared to the impact rating scales reported by Yaruss and Quesal (2006, 2008).

In addition, paired samples *t*-tests were also computed to test for significant differences between the group of CWS (Wait-List) and CWS (Pre-Group) on STAIC (state and trait anxiety sections), BFNE-II, SDQ, and OASES (Sections I, II, III & IV). The results obtained (as shown in Table 5.1) demonstrated significant differences

between the groups on most of the measures with a small effect size (Howell, 2007). An alpha level of .05 (two-tailed) was used for all statistical tests.

### *Impairment in Body Function*

Sixty nine percent of the CWS (Wait-List) demonstrated moderate stuttered speech severity (2-5 %SS) and thirty one percent demonstrated severe stuttered speech severity (>5 %SS) as classified by Guitar (2006). By contrast, seventy two percent of the CWS (Pre-Group) demonstrated moderate stuttered speech severity (2-5 %SS) and twenty eight percent demonstrated severe stuttered speech severity (>5 %SS).

Mean scores obtained for severity of stuttering (%SS) demonstrated that CWS demonstrated a significantly lower score at Pre-Group compared to Wait-List,  $t(38) = 2.46, p = .02$ .

Mean scores obtained which assessed self-awareness and knowledge of stuttering (OASES-SI) corresponded to the moderate impact rating for both CWS (Wait-List) and CWS (Pre-Group) (Yaruss and Quesal, 2006). A comparison between the mean self-awareness and knowledge of stuttering (OASES-SI) showed that CWS demonstrated a significantly higher self-awareness impact rating at Pre-Group compared to Wait-List,  $t(38) = -2.48, p = .02$ .

### *Personal Factors / Reactions*

Mean scores obtained on the state and trait anxiety inventory (STAIC) for CWS (Wait-List) and CWS (Pre-Group) were above the mean for state ( $M = 31.00$ ) and trait ( $M = 38.00$ ) anxiety scores reported in published normative data for school children younger than 11 years of age (Speilberger, 1973), indicating that the CWS at Wait-List and Pre-Group scored above normal clinical limits. A comparison between the means

showed that CWS (Pre-Group) scores on state anxiety were significantly higher compared to CWS (Wait-List),  $t(38) = -3.95, p < .001$ .

Mean scores for CWS (Wait-List) and CWS (Pre-Group) obtained from the fear of negative evaluation questionnaire (BFNE-II) were both above the mean scores of 19.68 (for males) and 25.20 (for females) reported in published normative data for university students (Carleton et al., 2007), indicating that both cohorts of CWS scored above normal limits. The CWS (Pre-Group) in this study demonstrated significantly greater fear of negative evaluation compared to CWS (Wait-List),  $t(38) = -2.91, p < .01$ .

Mean scores obtained which assessed reactions to stuttering (OASES-SII) corresponded to the moderate impact rating for both CWS (Wait-List) and CWS (Pre-Group) cohorts. This data also demonstrates that CWS (Pre-Group) reported statistically significant greater reactions to stuttering compared to CWS (Wait-List),  $t(38) = -2.85, p < .01$ .

### *Environmental Factors*

Mean scores for both the CWS (Wait-List) and CWS (Pre-Group) cohorts on behavioural and social difficulties were above the mean scores of 9.72 (children younger than 11) reported in published normative data of Australian children (Mellor, 2005), indicating that both CWS cohorts scored in the clinical range of behavioural and social difficulties. A comparison between the means showed that CWS (Pre-Group) compared to CWS (Wait-List) showed significantly higher behavioural and social difficulties,  $t(38) = -4.67, p < .001$ .

Mean scores obtained which assessed communication difficulties in daily situations (OASES-SIII) for CWS (Wait-List) and CWS (Pre-Group) both corresponded to the moderate-to-severe impact rating. A comparison between the means showed that



CWS (Pre-Group) compared to CWS (Wait-List) showed significantly greater communication difficulties in daily situations (OASES-SIII),  $t(38) = -3.29, p < .01$ .

### *Quality of Life*

Mean scores obtained which assessed quality of life for CWS (Wait-List) and CWS (Pre-Group) both corresponded to the moderate impact rating. A comparison between the means showed that CWS (Pre-Group) compared to CWS (Wait-List), demonstrated a statistically significant reduction in quality of life (OASES-SIV),  $t(38) = -2.93, p < .01$ .

Table 5.2: Means and Standard Deviations for AWS (Wait-list) and AWS (Pre-Group) ( $N = 21$ )

Measures	AWS (Wait-List)		AWS (Pre-Group)		<i>p</i> value	Effect size
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<b><i>Impaired BF</i></b>						
% SS	5.60	3.80	5.32	3.69	< .001	.07
OASES-SI	60.86	9.90	61.43	10.01	.02	.06
<b><i>Personal</i></b>						
STAI (state)	53.86	4.73	56.38	4.79	< .01	.53
STAI (trait)	56.52	2.99	57.24	3.14	.01	.23
BFNE-II	45.86	4.39	47.62	5.53	< .01	.35
OASES-SII	62.25	8.92	61.97	10.84	.74	.03
<b><i>Environmental</i></b>						
SDQ	13.52	1.86	14.48	1.75	< .01	.53
OASES-SIII	63.92	10.39	64.61	11.05	.10	.06
<b><i>Quality of Life</i></b>						
OASES-SIV	55.89	12.46	56.19	12.66	.06	.02
<b><i>Stage of Change</i></b>						
SOC (PRE)	30.81	3.86	21.90	5.41	< .001	1.9
SOC (CONT)	32.05	5.54	31.76	6.53	.59	.05
SOC (ACTION)	27.29	5.25	27.62	4.94	.20	.06
SOC (MAINT)	27.52	4.48	27.52	4.52	1.0	0
<b>Age</b>	12.48	0.68	12.62	0.80	.08	.19

### 5.3.2.2 Adolescents

The paired samples  $t$ -test showed a non-significant increase in the ages of AWS (Wait-List) and AWS (Pre-Group),  $t(20) = -1.83, p = .08$ .

Mean scores obtained on the STAI, BFNE-II, and SDQ questionnaires for AWS (Wait-List) and AWS (Pre-Group) were compared to published normative data reported in the literature (Spielberger, 1983; Carleton et al., 2007; Mellor, 2005). The mean scores obtained on the OASES questionnaire were compared to the impact rating scales reported by Yaruss and Quesal (2006, 2008).

In addition, paired samples  $t$ -tests were also computed to test for significant differences between the group of AWS (Wait-List) and AWS (Pre-Group) on STAI (state and trait anxiety sections), BFNE-II, SDQ, and OASES (Sections I, II, III & IV) and SOC (precontemplation, contemplation, action and maintenance). The results obtained (as shown in Table 5.2) demonstrated significant differences between the groups on some of the measures with a small to medium effect size (Howell, 2007). An alpha level of .05 (two-tailed) was used for all statistical tests.

#### *Impairment in Body Function*

Fifty six percent of the AWS (Wait-List) demonstrated moderate stuttered speech severity (2-5 %SS) and forty four percent demonstrated severe stuttered speech severity (>5 %SS) as classified by Guitar (2006). By contrast, sixty six percent of the AWS (Pre-Group) demonstrated moderate stuttered speech severity (2-5 %SS) stuttering behaviour and thirty three percent demonstrated severe (>5 %SS). A comparison between the mean percentage syllables stuttered (%SS) showed that AWS at Pre-Group had significantly lower severity of stuttering compared to Wait-List,  $t(20) = 4.71, p < .001$ .

Mean scores obtained which assessed self-awareness and knowledge of stuttering (OASES-SI) corresponded to the moderate-to-severe impact rating for both AWS (Wait-List) and AWS (Pre-Group) (Yaruss and Quesal, 2006). A comparison between the means of self-awareness and knowledge of stuttering (OASES-SI) showed that AWS demonstrated a significantly higher self-awareness and knowledge of stuttering at Pre-Group compared to Wait-List,  $t(20) = -2.55, p = .02$ .

#### *Personal Factors / Reactions*

Mean scores obtained for the state and trait inventory (STAI) for AWS (Wait-List) and AWS (Pre-Group) were both above the mean for state ( $M = 39.45$ ) and trait ( $M = 40.17$ ) anxiety scores reported in published normative data for high school students (Spielberger, 1983), indicating that both AWS cohorts scored above normal clinical limits. A comparison between the means showed that AWS (Pre-Group) demonstrated significantly higher mean state anxiety,  $t(20) = -3.33, p < .01$ ; and trait anxiety,  $t(20) = -2.86, p = .01$  compared to AWS (Wait-List).

Mean scores for AWS (Wait-List) and AWS (Pre-Group) obtained from the fear of negative evaluation questionnaire (BFNE-II) were both above the mean scores of 19.68 (for males) and 25.20 (for females) reported in normative data for university students (Carleton et al., 2007), indicating that both AWS cohorts scored above normal limits. A comparison between the means showed that AWS (Pre-Group) demonstrated significantly greater fear of being negatively evaluated compared to AWS (Wait-List),  $t(20) = -3.36, p < .01$ .

Mean scores obtained which assessed reactions to stuttering (OASES-SII) for AWS (Wait-List) and AWS (Pre-Group) both corresponded to the moderate-to-severe impact rating. A comparison between the means showed that AWS (Pre-Group)

demonstrated a non-significantly greater reaction to stuttering compared to AWS (Wait-List),  $t(20) = .34, p = .74$ .

### *Environmental Factors*

Mean scores of behavioural and social difficulties (SDQ) reported by AWS (Wait-List) and AWS (Pre-Group) were above the mean scores of 8.72 (children older than 11) reported in published normative data of Australian children (Mellor, 2005), indicating that both cohorts scored in the clinical range of behavioural and social difficulties. A comparison between the means showed that AWS (Pre-Group) compared to AWS (Wait-List) demonstrated significantly higher behavioural and social difficulties,  $t(20) = -3.63, p < .01$ .

Mean scores obtained which assessed communication difficulties in daily situations (OASES-SIII) for AWS (Wait-List) and AWS (Pre-Group) both corresponded to the moderate-to-severe impact rating. A comparison between the means showed that AWS (Pre-Group) compared to AWS (Wait-List) demonstrated non-significantly greater communication difficulties in daily situations (OASES-SIII),  $t(20) = -1.73, p = .10$ .

### *Quality of Life*

Mean scores which assessed quality of life (OASES-SIV) for AWS (Wait-List) and AWS (Pre-Group) both corresponded to the moderate impact rating. A comparison between the means showed that AWS (Pre-Group) compared to AWS (Wait-List), demonstrated a non-significant reduction in quality of life (OASES-SIV),  $t(20) = -2.02, p = .06$ .

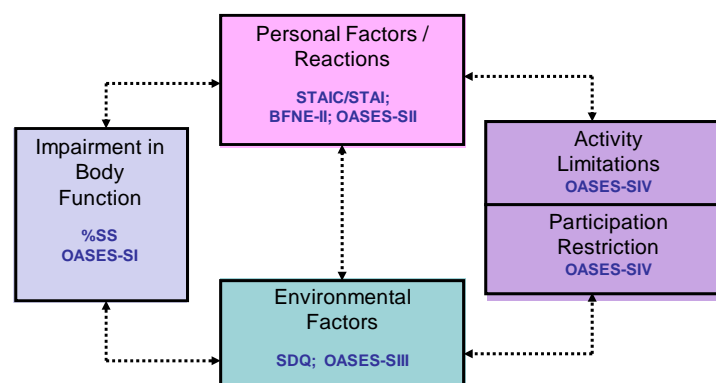
### *Stage of Change*

The stages of readiness for change were defined as precontemplation, contemplation, action and maintenance. Mean scores obtained for the Stage of Change questionnaire demonstrated that the majority of AWS (Wait-List) were positioned between the ‘precontemplation’ and ‘contemplation’ stage of readiness for change, whereas the majority of AWS (Pre-Group) were positioned between the ‘contemplation’ and ‘action’ stage of readiness for change (Floyd et al., 2007).

A comparison between the means showed that AWS (Pre-Group) compared to AWS (Wait-List) demonstrated a significant reduction in the ‘precontemplation’ stage of readiness to change,  $t(20) = 5.43, p < .001$ . This results demonstrates that AWS at the Pre-Group time-point demonstrate less ambivalence about the change process compared to AWS 8 weeks earlier (Wait-List).

### **5.3.3 Correlations Between Variables**

Pearson product moment correlations were computed to determine the inter-relationship between each measure within the CWS and AWS Pre-Group participant cohorts. Figure 5.2 presents a schematic version of the Yaruss and Quesal (2004) sub-components with the psychosocial measures superimposed.



**Figure 5.2:** Sub-components of the Yaruss & Quesal (2004) model with psychosocial measures superimposed.

#### 5.3.3.1 Children who Stutter (Pre-Group)

Table 5.3 presents the correlations for these psychosocial variables for the CWS (Pre-Group).

##### *Impairment in Body Function*

Statistically significant correlations were obtained between severity of stuttering (%SS) and self-awareness and knowledge of stuttering (OASES-SI),  $r(37) = .39, p = .01$ .

##### *Personal Factors/Reactions*

Statistically significant associations were obtained between state and trait anxiety,  $r(37) = .60, p < .001$ ; state anxiety and fear of negative evaluation (BFNE-II),  $r(37) = .35, p = .03$ ; trait anxiety and fear of negative evaluation (BFNE-II),  $r(37) = .36, p = .02$ ; and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII),  $r(37) = .50, p = .001$ .

##### *Environmental Factors*

Statistically significant relationships were obtained between behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .38, p = .02$ .

##### *Impairment in Body Function and Personal Factors/Reactions*

Relationships which were statistically significant were obtained between severity of stuttering (%SS) and trait anxiety,  $r(37) = .39, p = .01$ ; severity of stuttering (%SS) and reactions to stuttering (OASES-SII),  $r(37) = .32, p = .05$ ; self-awareness and knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(37) = .60, p < .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and reactions to stuttering (OASES-SII),  $r(37) = .60, p < .001$ .

Table 5.3: Intercorrelations for CWS (Pre-Group,  $N = 39$ )

Measures	% SS	OASES-SI	STAIC-S	STAIC-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	AGE
% SS	-	.39*	.15	.39*	.27	.32*	.45**	.46**	.46**	-.18
OASES-SI		-	.25	.24	.60**	.60**	.24	.63**	.48**	.10
STAIC (state)			-	.60**	.35*	.24	.27	.49**	.38*	.17
STAIC (trait)				-	.36*	.14	.41*	.34*	.29	-.06
BFNE-II					-	.50**	.35*	.58**	.52**	.24
OASES-SII						-	.20	.72**	.85**	.26
SDQ							-	.38*	.46*	-.09
OASES-SIII								-	.84**	.15
OASES-SIV									-	.26
AGE										-

Note \* $p < .05$ , \*\* $p < .01$ .

### *Impairment in Body Function and Environmental Factors*

Statistically significant associations were obtained between severity of stuttering (%SS) and behavioural and social difficulties (SDQ),  $r(37) = .45, p < .01$ ; severity of stuttering (%SS) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .46, p < .01$ ; and self-awareness and knowledge of stuttering (OASES-SI) and communication in daily situations (OASES-SIII),  $r(37) = .63, p < .001$ .

### *Impairment in Body Function and Activity Limitations / Participation Restriction*

Statistically significant relationships were obtained between severity of stuttering (%SS) and quality of life (OASES-SIV),  $r(37) = .46, p < .01$ ; and self-awareness and knowledge of stuttering (OASES-SI) and quality of life (OASES-SIV),  $r(37) = .48, p < .01$ .

### *Personal Factors / Reactions and Environmental Factors*

Relationships which were statistically significant were obtained between state anxiety and communication difficulties in daily situations (OASES-SIII),  $r(37) = .49, p < .01$ ; trait anxiety and behavioural and social difficulties (SDQ),  $r(37) = .41, p < .01$ ; trait anxiety and communication difficulties in daily situations (OASES-SIII),  $r(37) = .34, p < .01$ ; fear of negative evaluation (BFNE-II) and behavioural and social difficulties (SDQ),  $r(37) = .35, p = .03$ ; fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .58, p < .001$ ; and reactions to stuttering (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(37) = .72, p < .001$ .

### *Personal Factors / Reactions and Activity Limitations / Participation Restriction*

Statistically significant associations were obtained between state anxiety and quality of life (OASES-SIV),  $r(37) = .38, p = .02$ ; fear of negative evaluation (BFNE-II)



and quality of life (OASES-SIV),  $r(37) = .52, p = .001$ ; and reactions to stuttering (OASES-SII) and quality of life (OASES-SIV),  $r(37) = .85, p = < .001$ .

#### *Environmental Factors and Activity Limitations / Participation Restriction*

Relationships which were statistically significant were obtained between behavioural and social difficulties (SDQ) and quality of life (OASES-SIV),  $r(37) = .46, p < .01$ ; and communication difficulties in daily situations (OASES-SIII) and OASES-quality of life (OASES-SIV),  $r(37) = .84, p = < .001$ .

#### 5.3.3.2 Adolescents who Stutter (Pre-Group)

Pearson product moment correlations were computed to determine the relationship between each measure within each group. Table 5.4 represents the correlations for these psychosocial variables for AWS (Pre-Group).

#### *Impairment in Body Function*

Statistically significant correlations were obtained between severity of stuttering (%SS) and self-awareness and knowledge of stuttering (OASES-SI),  $r(19) = .54, p < .01$ .

#### *Personal Factors/Reactions*

Relationships which were statistically significant were obtained between state and trait anxiety,  $r(19) = .91, p = < .001$ ; state anxiety and fear of negative evaluation (BFNE-II),  $r(19) = .51, p = .02$ ; state anxiety and reactions to stuttering (OASES-SII),  $r(19) = .59, p < .01$ ; and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII),  $r(34) = .55, p = < .01$ .

Table 5.4: Intercorrelations for AWS (Pre-Group,  $N = 21$ )

Measures	% SS	OASES-SI	STAI-S	STAI-T	BFNE-II	OASES-SII	SDQ	OASES-SIII	OASES-SIV	SOC (PRE)	SOC (CONT)	SOC (ACT)	SOC (MAIN)	AGE
% SS	-	.54*	.41	.61**	.27	.43	.39	.37	.39	-.17	.12	.07	-.11	.22
OASES-SI		-	.52*	.58**	.68**	.65**	.29	.79**	.62**	-.11	.06	-.05	-.14	.33
STAI (state)			-	.91**	.51*	.59**	.34	.58**	.61**	-.28	.40	.35	.25	.30
STAI (trait)				-	.43	.55**	.38	.57**	.51*	-.38	.47*	.39	.22	.45*
BFNE-II					-	.55**	.50*	.58**	.53*	.00	.01	-.05	-.10	.34
OASES-SII						-	.49*	.81**	.86**	-.43	.33	.13	.10	.20
SDQ							-	.52*	.51*	-.31	.16	.13	.08	-.01
OASES-SIII								-	.81**	-.23	.12	.02	-.05	.31
OASES-SIV									-	-.16	.04	-.09	-.13	.13
SOC (PRE)										-	-.90**	-.73**	-.71**	-.10
SOC (CONT)											-	.75**	.75**	.14
SOC (ACT)												-	.92**	.03
SOC (MAIN)													-	-.08
AGE														-

### *Environmental Factors*

Statistically significant correlations were obtained between behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .52, p = .02$ .

### *Impairment of Body Function and Personal Factors/Reactions*

Within the group of AWS (Pre-Group), statistically significant correlations were obtained between severity of stuttering (%SS) and trait anxiety,  $r(34) = .61, p = <.01$ ; self-awareness and knowledge of stuttering (OASES-SI) and trait anxiety,  $r(19) = .58, p < .01$ ; self-awareness and knowledge of stuttering (OASES-SI) and fear of negative evaluation (BFNE-II),  $r(19) = .68, p = .001$ ; and self-awareness and knowledge of stuttering (OASES-SI) and reactions to stuttering (OASES-SII),  $r(19) = .65, p = .001$ .

### *Impairment in Body Function and Environmental Factors*

Relationships were obtained which were statistically significant between self-awareness and knowledge of stuttering (OASES-SI) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .79, p < .001$ .

### *Impairment of Body Function and Quality of Life*

Statistically significant associations were obtained between self-awareness and knowledge of stuttering (OASES-SI) and quality of life (OASES-SIV),  $r(34) = .62, p < .01$ .

### *Personal Factors / Reactions and Environmental Factors*

Within the group of AWS (Pre-Group), statistically significant relationships were obtained between state anxiety and communication difficulties in daily situations (OASES-SIII),  $r(19) = .58, p < .02$ ; trait anxiety and communication difficulties in daily situations (OASES-SIII),  $r(19) = .57, p < .02$ ; fear of negative evaluation (BFNE-II) and

behavioural and social difficulties (SDQ),  $r(19) = .50, p = .02$ ; fear of negative evaluation (BFNE-II) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .58, p < .01$ ; reactions to stuttering (OASES-SII) and behavioural and social difficulties (SDQ),  $r(19) = .49, p = .02$ ; and reactions to stuttering (OASES-SII) and communication difficulties in daily situations (OASES-SIII),  $r(19) = .81, p < .001$ .

#### *Personal Factors / Reactions and Quality of Life*

Statistically significant correlations were obtained between state anxiety and quality of life (OASES-SIV),  $r(19) = .61, p < .01$ ; trait anxiety and quality of life (OASES-SIV),  $r(19) = .51, p = .02$ ; fear of negative evaluation (BFNE-II) and quality of life (OASES-SIV),  $r(19) = .53, p = .02$ ; and reactions to stuttering (OASES-SII) and quality of life (OASES-SIV),  $r(19) = .86, p < .001$ .

#### *Environmental Factors and Quality of Life*

Within the group of AWS (Pre-Group), statistically significant associations were obtained between behavioural and social difficulties (SDQ) and quality of life (OASES-SIV),  $r(19) = .51, p = .02$ ; and communication difficulties in daily situations (OASES-SIII) and quality of life (OASES-SIV),  $r(19) = .81, p < .001$ .

#### *Stage of Change*

The stages of readiness for change were defined as precontemplation, contemplation, action and maintenance. Analysis of AWS (Pre-Group) responses demonstrated statistically significant correlations between trait anxiety and SOC contemplation,  $r(19) = .47, p = .03$ ; precontemplation and contemplation,  $r(19) = -.90, p < .001$ ; precontemplation and action,  $r(19) = -.73, p < .001$ ; precontemplation and maintenance,  $r(19) = -.71, p < .001$ ; contemplation and action,  $r(19) = .75, p < .001$ ;

contemplation and maintenance,  $r(19) = .75, p < .001$ ; and action and maintenance),  $r(9) = .92, p < .001$ .

### *Age*

Within the group of AWS (Pre-Group), a statistically significant correlations were obtained between Age and trait anxiety,  $r(19) = .45, p = .04$ .

### **5.3.4 Fisher r-to-z transformation**

A Fisher  $r$ -to- $z$  transformation was applied to the data to test for significant differences between the correlation coefficients obtained for each comparison within each group (as per Cohen & Cohen, 2003).

#### 5.3.4.1 CWS (Wait-List) and CWS (Pre-Group)

No statistically significant differences were found between the correlation coefficients as shown in Table 5.5.

#### 5.3.4.2 AWS (Wait-List) and AWS (Pre-Group)

No statistically significant differences were found between the correlation coefficients as shown in Table 5.6.

#### 5.3.4.3 CWS (Pre-Group) and AWS (Pre-Group)

Only one statistically significant difference was found between the correlation coefficients as shown in Table 5.7.

### *Personal Factors / Reactions*

In the comparison between the CWS and AWS, statistically significant differences in correlations were obtained between state anxiety and trait anxiety,  $z = -2.89, p < .01$ .

Table 5.5: Comparison of Intercorrelations for CWS (Wait-List) and CWS (Pre-Group)

Measures	Correlation Coefficient		z	p value (2-tailed)
	WL	PRE		
<b>Impairment</b>				
% SS vs OASES-SI	.44**	.39*	.26	.79
<b>Personal</b>				
STAIC (state) vs STAIC (trait)	.73**	.60**	1.00	.31
STAIC (state) vs BFNE-II	.38*	.35*	.15	.88
STAIC (trait) vs BFNE-II	.26	.36*	-.47	.64
STAIC (state) vs OASES-SII	.10	.24	-.61	.54
STAIC (trait) vs OASES-SII	.07	.14	-.30	.76
BFNE-II vs OASES-SII	.49**	.50**	-.06	.95
<b>Environmental</b>				
SDQ vs OASES-SIII	.40*	.38*	.10	.92
<b>Impairment vs Personal</b>				
OASES-SI vs STAI (state)	.06	.25	-.83	.41
OASES-SI vs STAI (trait)	.16	.24	-.35	.73
OASES-SI vs BFNE-II	.58**	.60**	-.13	.90
OASES-SI vs OASES-SII	.61**	.60**	.07	.94
<b>Impairment vs Environmental</b>				
OASES-SI vs SDQ	.39*	.24	.71	.48
OASES-SI vs OASES-SIII	.66**	.63**	.22	.83
<b>Impairment vs QoL</b>				
OASES-SI vs OASES-SIV	.46**	.48**	-.11	.91
<b>Personal vs Environmental</b>				
STAIC (state) vs SDQ	.15	.27	-.53	.60
STAIC (trait) vs SDQ	.16	.41*	-1.16	.25
BFNE-II vs SDQ	.34*	.35*	-.05	.96
OASES-SII vs SDQ	.31	.20	.50	.62
STAIC (state) vs OASES-SIII	.33*	.49**	-.82	.41
STAIC (trait) vs OASES-SIII	.28	.34*	-.28	.78
BFNE-II vs OASES-SIII	.62**	.58**	.27	.78
OASES-SII vs OASES-SIII	.72**	.72**	.00	1.00
<b>Personal vs QoL</b>				
STAIC (state) vs OASES-SIV	.32*	.38*	-.29	.77
STAIC (trait) vs OASES-SIV	.27	.29	-.09	.93
BFNE-II vs OASES-SIV	.52**	.52**	.00	1.00
OASES-SII vs OASES-SIV	.84**	.85**	-.15	.88
<b>Environmental vs QoL</b>				
SDQ vs OASES-SIV	.50**	.46**	.22	.83
OASES-SIII vs OASES-SIV	.81**	.84**	-.40	.69

Note. \* $p < .05$ , \*\* $p < .01$

Table 5.6: Comparison of Intercorrelations for AWS (Wait-List) and AWS (Pre-Group)

Measures	Correlation Coefficient		z	p value (2-tailed)
	WL	PRE		
<b>Impaired</b>				
% SS vs OASES-SI	.44**	.54*	-.45	.65
<b>Personal</b>				
STAI (state) vs STAI (trait)	.81**	.91**	-1.20	.23
STAI (state) vs BFNE-II	.57**	.51*	.25	.80
STAI (trait) vs BFNE-II	.42	.43	-.04	.97
STAI (state) vs OASES-SII	.41	.58**	-.68	.50
STAI (trait) vs OASES-SII	.43	.55**	-.48	.63
BFNE-II vs OASES-SII	.49*	.55**	-.25	.80
<b>Environmental</b>				
SDQ vs OASES-SIII	.20	.52*	-1.12	.26
<b>Impairment vs Personal</b>				
OASES-SI vs STAI (state)	.59**	.52*	.30	.76
OASES-SI vs STAI (trait)	.59**	.58**	.05	.96
OASES-SI vs BFNE-II	.67**	.68**	-.06	.95
OASES-SI vs OASES-SII	.63**	.65**	-.10	.92
<b>Impairment vs Environmental</b>				
OASES-SI vs SDQ	.04	.29	-.78	.44
OASES-SI vs OASES-SIII	.81**	.79**	.17	.87
<b>Impairment vs QoL</b>				
OASES-SI vs OASES-SIV	.60**	.62**	-.10	.92
<b>Personal vs Environmental</b>				
STAI (state) vs SDQ	.20	.34	-.45	.65
STAI (trait) vs SDQ	.20	.38	-.59	.56
BFNE-II vs SDQ	.46*	.50*	-.16	.87
OASES-SII vs SDQ	.17	.49*	-1.09	.28
STAI (state) vs OASES-SIII	.62**	.58**	.19	.85
STAI (trait) vs OASES-SIII	.59**	.57**	.09	.93
BFNE-II vs OASES-SIII	.57**	.58**	-.05	.96
OASES-SII vs OASES-SIII	.82**	.81**	.09	.93
<b>Personal vs QoL</b>				
STAI (state) vs OASES-SIV	.45*	.61**	-.67	.50
STAI (trait) vs OASES-SIV	.36	.51*	-.56	.58
BFNE-II vs OASES-SIV	.59**	.53*	.26	.79
OASES-SII vs OASES-SIV	.92*	.86**	.89	.37
<b>Environmental vs QoL</b>				
SDQ vs OASES-SIV	.33	.51*	-.66	.51
OASES-SIII vs OASES-SIV	.81**	.81**	.00	1.00

Note. \*p&lt;.05, \*\*p&lt;.01.

Table 5.7: Comparison of Intercorrelations for CWS and AWS at Pre-Group

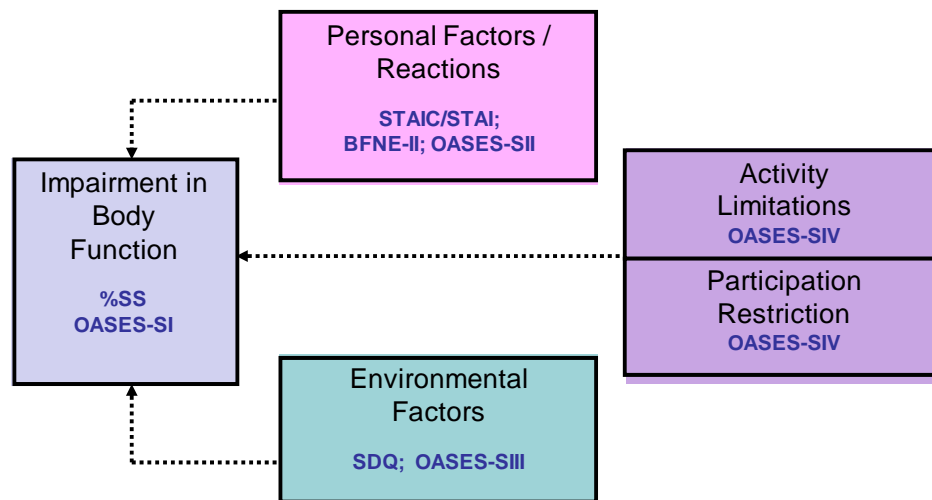
Measures	Correlation Coefficient		z	P value (2-tailed)
	CWS	AWS		
<b>Impairment</b>				
% SS vs OASES-SI	.39*	.54*	-.67	.50
<b>Personal</b>				
STAI (state) vs STAI (trait)	.60**	.91**	-2.89	< .01
STAI (state) vs BFNE-II	.35*	.51*	-.68	.50
STAI (trait) vs BFNE-II	.36*	.43	-.29	.77
STAI (state) vs OASES-SII	.24	.58**	-1.45	.15
STAI (trait) vs OASES-SII	.14	.55**	-1.65	.10
BFNE-II vs OASES-SII	.50**	.55**	-.24	.81
<b>Environmental</b>				
SDQ vs OASES-SIII	.38*	.52*	-.61	.54
<b>Impairment vs Personal</b>				
OASES-SI vs STAI (state)	.25	.52*	-1.11	.27
OASES-SI vs STAI (trait)	.24	.58**	-1.45	.15
OASES-SI vs BFNE-II	.60**	.68**	-.47	.64
OASES-SI vs OASES-SII	.60**	.65**	-.28	.78
<b>Impairment vs Environmental</b>				
OASES-SI vs SDQ	.24	.29	-.19	.85
OASES-SI vs OASES-SIII	.63**	.79**	-1.14	.25
<b>Impairment vs QoL</b>				
OASES-SI vs OASES-SIV	.48**	.62**	-.70	.48
<b>Personal vs Environmental</b>				
STAI (state) vs SDQ	.27	.34	-.27	.79
STAI (trait) vs SDQ	.41*	.38	.12	.90
BFNE-II vs SDQ	.35*	.50*	-.64	.52
OASES-SII vs SDQ	.20	.49*	-1.15	.25
STAI (state) vs OASES-SIII	.49**	.58**	-.44	.66
STAI (trait) vs OASES-SIII	.34*	.57**	-1.02	.31
BFNE-II vs OASES-SIII	.58**	.58**	.00	1.00
OASES-SII vs OASES-SIII	.72**	.81**	-.76	.45
<b>Personal vs QoL</b>				
STAI (state) vs OASES-SIV	.38*	.61**	-1.07	.28
STAI (trait) vs OASES-SIV	.29	.51*	-.91	.36
BFNE-II vs OASES-SIV	.52**	.53*	-.05	.96
OASES-SII vs OASES-SIV	.85**	.86**	-.13	.90
<b>Environmental vs QoL</b>				
SDQ vs OASES-SIV	.46**	.51*	-.23	.82
OASES-SIII vs OASES-SIV	.84**	.81**	.33	.74

Note. \* $p < .05$ , \*\* $p < .01$ .



### 5.3.5 Multiple Regression Analyses

The Yaruss and Quesal (2004) model was designed to depict how the stuttering disorder could be viewed in terms of several interacting components. Standard multiple regression analyses (MRA) was used to evaluate whether combinations of psychosocial variables measured (i.e., STAIC/STAI, BFNE-II, OASES-SII; SDQ, OASES-SIII; and OASES-SIV) were related toward and could account for the variance in the *Impairment in Body Function* component (i.e., %SS and OASES-SI).



**Figure 5.3:** Schematic adaption of the Yaruss and Quesal (2004) model sub-components depicting the various multiple regression analyses performed. Note specific arrow delineations.

Prior to interpreting the results of the MRA, several assumptions were evaluated. First, inspection of the normal probability plots of standardised residuals as well as the scatterplots of standardised residuals against standardised predicted values indicated that the assumptions of normality, linearity and homoscedasticity of residuals were met. Second, Mahalanobis distance was calculated and did not exceed the critical  $\chi^2$  for the degrees of freedom (at  $\alpha = .001$ ) for any cases in the data file, indicating that multivariate outliers were not of concern. Third, relatively high tolerances for all predictors in the regression model indicated that multicollinearity would not interfere with the interpretation of the outcome of multiple regression analyses.

### 5.3.5.1 Children Who Stutter (Pre-Group)

#### *Personal Factors / Reactions*

In combination, the four personal factors/reactions predictor variables explained 27.2% of the variance in stuttering severity (%SS),  $R^2 = .272$ , adjusted  $R^2 = .187$ ,  $F(4,34) = 3.18$ ,  $p = .03$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .37$ ).

Collectively, the four personal factors/reactions predictor variables explained 48.1% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .481$ , adjusted  $R^2 = .420$ ,  $F(4,34) = 7.88$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .93$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 5.8.

Table 5.8: Results from MRA of Personal Factors/Reactions in CWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each personal factor/reaction predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
STAIC (state)	-.20	-.32	.050	-1.53	.14
STAIC (trait)	.24*	.56	.154	2.69	.01
BFNE-II	.01	.02	.000	.12	.91
OASES-SII	.08	.31	.069	1.79	.08
<b>OASES-SI</b>					
STAIC (state)	-.05	-.03	.000	-.14	.89
STAIC (trait)	.08	.06	.002	.34	.74
BFNE-II	.63*	.38	.095	2.50	.02
OASES-SII	.34**	.41	.124	2.85	< .01

Note. \* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 5.8, trait anxiety was a significant predictor of stuttering severity (%SS) and fear of negative evaluation (BFNE-II) and reactions to stuttering (OASES-SII) were significant predictors of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

#### *Environmental Factors*

In combination, the two environmental factors predictor variables explained 30.3% of the variance in stuttering severity (%SS),  $R^2 = .303$ , adjusted  $R^2 = .265$ ,  $F(2,36) = 7.84$ ,  $p = .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .43$ ).

Collectively, the two environmental factors predictor variables explained 39.5% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .395$ , adjusted  $R^2 = .362$ ,  $F(2,36) = 11.76$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .65$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 5.9.

Table 5.9: Results from MRA of Environmental Factors in CWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each environmental predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>Severity</b>					
SDQ	.31*	.33	.091	2.17	.04
OASES-SIII	.07*	.34	.098	2.25	.03
<b>OASES-SI</b>					
SDQ	.02	.01	.000	.05	.96
OASES-SIII	.46**	.63	.336	4.48	< .001

\* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 5.9, behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII) were significant predictors of stuttering severity (%SS) and communication difficulties in daily situations (OASES-SIII) was a significant predictor of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

### *Quality of Life*

The quality of life predictor variable explained 21.3% of the variance in stuttering severity,  $R^2 = .213$ , adjusted  $R^2 = .192$ ,  $F(1,37) = 10.03$ ,  $p < .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered medium ( $f^2 = .27$ ).

The quality of life predictor variable explained 22.9% of the variance in stuttering typography,  $R^2 = .229$ , adjusted  $R^2 = .209$ ,  $F(1,37) = 11.01$ ,  $p < .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered medium ( $f^2 = .30$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for the predictor in the regression model are reported in Table 5.10.

Table 5.10: Results from MRA of Quality of Life in CWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for quality of life predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
OASES-SIV	.10**	.46	.213	3.17	< .01
<b>OASES-SI</b>					
OASES-SIV	.35**	.48	.229	3.32	< .01

\* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 5.10, quality of life (OASES-SIV) was a significant predictor of stuttering severity (%SS) and self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

### 5.3.5.2 Adolescents Who Stutter (Pre-Group)

#### *Personal Factors / Reactions*

In combination, the four personal factors/reactions predictor variables explained 53.6% of the variance in stuttering severity,  $R^2 = .536$ , adjusted  $R^2 = .420$ ,  $F(4,16) = 4.62$ ,  $p = .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = 1.16$ ).

Collectively, the four personal factors/reactions predictor variables explained 65.3% of the variance in self-awareness and knowledge of stuttering (OASES-SI),  $R^2 = .653$ , adjusted  $R^2 = .567$ ,  $F(4,16) = 7.54$ ,  $p = .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = 1.88$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 5.11.

Table 5.11: Results from MRA of Personal Factors/Reactions in AWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each personal factor/reaction predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
STAI (state)	-.79	-1.03	.154	-2.31	.04
STAI (trait)	1.63**	1.39	.315	3.29	< .01
BFNE-II	.04	.06	.003	.30	.77
OASES-SII	.08	.23	.031	1.03	.32
<b>OASES-SI</b>					
STAI (state)	-1.16	-.56	.045	-1.44	.17
STAI (trait)	2.22	.70	.080	1.92	.07
BFNE-II	.86*	.47	.142	2.56	.02
OASES-SII	.31	.33	.062	1.70	.11

\* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 5.11, trait anxiety was the only significant predictor of stuttering severity (%SS) and fear of negative evaluation was the only significant predictor of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

#### *Environmental Factors*

In combination, the two environmental factors predictor variables accounted for a non-significant 18.9% of the variability in stuttering severity,  $R^2 = .189$ , adjusted  $R^2 = .099$ ,  $F(2,18) = 2.10$ ,  $p = .15$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered medium ( $f^2 = .23$ ).

Collectively, the two environmental factors predictor variables accounted for a 64.4% of the variance in OASES-SI,  $R^2 = .664$ , adjusted  $R^2 = .604$ ,  $F(2,18) = 16.27$ ,  $p < .001$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = 1.81$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for each predictor in the regression model are reported in Table 5.12.

Table 5.12: Results from MRA of Environmental Factors in AWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for each environmental predictor variable in the regression models predicting stuttering severity and OASES-SI.

Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
SDQ	.56	.26	.051	1.06	.30
OASES-SIII	.08	.24	.041	.95	.35
<b>OASES-SI</b>					
SDQ	-.92	-.16	.019	-.98	.34
OASES-SIII	.79**	.87	.560	5.32	< .001

\* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 5.12, communication difficulty in daily situations (OASES-SIII) was the only significant predictor of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

### *Quality of Life*

The quality of life predictor variable accounted for a non-significant 15.2% of the variance in stuttering severity,  $R^2 = .152$ , adjusted  $R^2 = .107$ ,  $F(1,19) = 3.41$ ,  $p = 0.8$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered medium ( $f^2 = .18$ ).

The quality of life predictor variable accounted for 37.8% of the variance in OASES-SI,  $R^2 = .378$ , adjusted  $R^2 = .346$ ,  $F(1,19) = 11.57$ ,  $p < .01$ . By Cohen's (1988) conventions, a combined effect of this magnitude can be considered large ( $f^2 = .61$ ).

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, and squared semi-partial correlations ( $sr^2$ ) for the predictor in the regression model are reported in Table 5.13.

Table 5.13: Results from MRA of Quality of Life Factor in AWS

Unstandardised ( $B$ ) and standardised ( $\beta$ ) regression coefficients, squared semi-partial correlations ( $sr^2$ ),  $t$ -values and significance for quality of life predictor variable in the regression models predicting stuttering severity and OASES-SI.

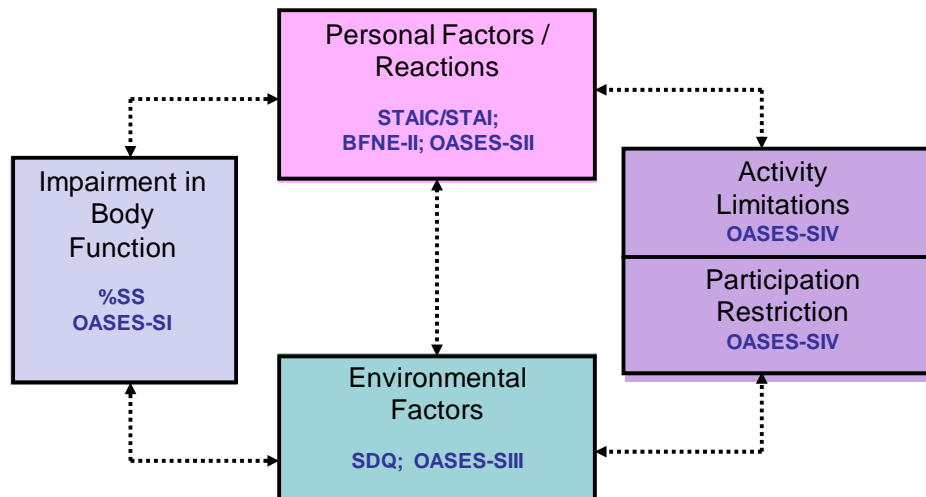
Variable	$B$	$\beta$	$sr^2$	$t$ -value	$p$ value
<b>% SS</b>					
OASES-SIV	.11	.39	.152	1.85	.08
<b>OASES-SI</b>					
OASES-SIV	.49	.62	.378	3.40	< .01

\* $p < .05$ , \*\* $p < .01$ .

As can be seen in Table 5.13, quality of life (OASES-SIV) was a significant predictor of self-awareness and knowledge of stuttering (OASES-SI) in the final regression models.

### 5.3.6 Exploratory Factor Analysis

To investigate the underlying structure of the assessment and questionnaire data collected from children and adolescents who stutter in this study, which had been mapped onto each of the four biopsychosocial components of the model provided by Yaruss and Quesal (2004) (see Figure 5.4), principal component analysis with Oblimin rotation was used.



**Figure 5.4:** Biopsychosocial components of the Yaruss & Quesal (2004) model with psychosocial measures superimposed.

Prior to data entry we further sub-categorised the data obtained from the OASES questionnaire (see Appendix A) into each of the separate OASES questionnaire sub-categories (i.e., OASES-SIA, B and C; OASES-SIIA, B, and C; OASES-SIIIA, B, C, and D; and OASES-SIVA, B, C, D and E) in order to more distinctively explore the factor structure of the assessment and questionnaire data which had been mapped onto the four biopsychosocial components.

Prior to running the principal component analysis, the suitability of the data for factor analysis was assessed. Examination of the data indicated that not every variable was normally distributed. Given the robust nature of factor analysis, these deviations were not considered problematic. Inspection of the correlation matrix revealed the



presence of many coefficients of .3 and above. The Kaiser-Meyer-Okin value was also inspected to ensure that it exceeded the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix. In addition, an inspection of the screeplot was also carried to assist in our choice of final factors.

#### 5.3.6.1 Children Who Stutter (Pre-Group)

##### *Impairment in Body Function*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the measures used for the assessment of Impairment in Body Function (see Table 5.14). In total, these factors accounted for 57.41% of the variance in the assessment and questionnaire data.

##### *Personal Factors / Reactions*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the questionnaire measures used for the assessment of Personal Factors / Reactions (see Table 5.14). In total, these factors accounted for 69.01% of the variance in the questionnaire data.

##### *Environmental Factors*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures used for the assessment of Environmental Factors (see Table 5.14). In total, this factor accounted for 58.10% of the variance in the questionnaire data.

##### *Quality of Life*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures used for the assessment of Quality of Life (see Table 5.14). In total, this factor accounted for 70.59% of the variance in the questionnaire data.

Table 5.14: Factor structure of biopsychosocial components in Children ( $N = 39$ )

Measures	Loadings	
	Component 1	Component 2
<b>Impairment</b>	<b><i>“Impairment”</i></b>	
% SS	<b>.59</b>	
OASES-SIA	<b>.78</b>	
OASES-SIB	<b>.78</b>	
OASES-SIC	<b>.86</b>	
Percentage of Variance	57.41%	
<b>Personal</b>	<b><i>“Reactions”</i></b>	<b><i>“Anxiety”</i></b>
STAIC (state)	.27	<b>.89</b>
STAIC (trait)	.16	<b>.92</b>
BFNE-II	<b>.63</b>	.52
OASES-SIIA	<b>.83</b>	.18
OASES-SIIB	<b>.80</b>	.20
OASES-SIIB	<b>.80</b>	.13
Percentage of Variance	45.03%	23.98%
<b>Environmental</b>	<b><i>“Environmental”</i></b>	
SDQ	<b>.49</b>	
OASES-SIIIA	<b>.93</b>	
OASES-SIIB	<b>.68</b>	
OASES-SIIC	<b>.83</b>	
OASES-SIID	<b>.81</b>	
Percentage of Variance	58.10%	
<b>Quality of Life</b>	<b><i>“Quality of Life”</i></b>	
OASES-SIVA	<b>.86</b>	
OASES-SIVB	<b>.87</b>	
OASES-SIVC	<b>.82</b>	
OASES-SIVD	<b>.78</b>	
OASES-SIVE	<b>.87</b>	
Percentage of Variance	70.59%	

#### 5.3.6.2 Adolescents who Stutter (Pre-Group)

##### *Impairment in Body Function*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the measures used for the assessment of Impairment in Body Function (see Table 5.15). In total, these factors accounted for 80.87% of the variance in the assessment and questionnaire data.

##### *Personal Factors / Reactions*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures used for the assessment of Personal Factors / Reactions (see Table 5.15). In total, this factor accounted for 59.59% of the variance in the questionnaire data.

##### *Environmental Factors*

Two factors (with Eigenvalues exceeding 1) were identified as underlying the questionnaire measures used for the assessment of Environmental Factors (see Table 5.15). In total, these factors accounted for 81.53% of the variance in the questionnaire data.

##### *Quality of Life*

One factor (with Eigenvalues exceeding 1) was identified as underlying the questionnaire measures used for the assessment of Quality of Life (see Table 5.15). In total, this factor accounted for 77.24% of the variance in the questionnaire data.

Table 5.15: Factor structure of biopsychosocial components in Adolescents ( $N = 21$ )

Measures	Loadings	
	Component 1	Component 2
<b>Impairment</b>	<i>“Self-Awareness”</i>	<i>“Knowledge”</i>
% SS	<b>.65</b>	.54
OASES-SIA	<b>.91</b>	.01
OASES-SIB	.17	<b>.95</b>
OASES-SIC	<b>.93</b>	.28
Percentage of Variance	55.84%	25.03%
<b>Personal</b>	<i>“Reactions”</i>	
STAI (state)	<b>.87</b>	
STAI (trait)	<b>.83</b>	
BFNE-II	<b>.70</b>	
OASES-SIIA	<b>.75</b>	
OASES-SIIB	<b>.77</b>	
OASES-SIIB	<b>.70</b>	
Percentage of Variance	59.59%	
<b>Environmental</b>	<i>“Family/Social”</i>	<i>“School”</i>
SDQ	.28	<b>.90</b>
OASES-SIIIA	<b>.85</b>	.67
OASES-SIIIB	.51	<b>.90</b>
OASES-SIIIC	<b>.93</b>	.36
OASES-SIIID	<b>.85</b>	.28
Percentage of Variance	61.46%	20.07%
<b>Quality of Life</b>	<i>“Quality of Life”</i>	
OASES-SIVA	<b>.80</b>	
OASES-SIVB	<b>.96</b>	
OASES-SIVC	<b>.89</b>	
OASES-SIVD	<b>.83</b>	
OASES-SIVE	<b>.91</b>	
Percentage of Variance	77.24%	

## 5.4 DISCUSSION

The study detailed in this Chapter was a comparison between the children and adolescents who stutter at the Wait-List time-point and 8 weeks later at the Pre-Group time-point prior to commencing the Fluency & Confidence group program. This study confirmed that the psychosocial impact of stuttering demonstrated in this CWS and AWS cohort at Wait-List was sustained for an 8 week period to Pre-Group. At the Pre-Group time-point, children and adolescents who stuttered reported statistically and clinically significant levels of impairment in body function (self-awareness of speaking ability), personal factors/reactions (state and trait anxiety, social anxiety and reactions to speaking ability), environmental factors (behaviour, social and communication difficulties in daily situations), and quality of life (activity limitations and participation restrictions) which remained elevated over this 8 week duration. This study reinforced and confirmed the reliability of findings for these child and adolescent cohorts over time and provided a baseline assessment of various psychosocial variables prior to commencing the Fluency & Confidence group treatment program.

These findings suggest that researchers and clinicians challenge previous literature regarding the association between anxiety, psychosocial variables and the severity of stuttering. The findings detailed in both Chapter 3 and this current Chapter 5 make an important contribution to the wider literature regarding the impact of the stuttering disorder on anxiety and psychosocial variables in children and adolescents who stutter, especially given the limited number of studies published in this area to date. In addition, the data obtained from these children and adolescents who stutter supported and reinforced the Yaruss and Quesal (2004) model which depicted a framework in which the stuttering disorder could be viewed in terms of several interacting biopsychosocial components.

The following section commences by discussing the theoretical and practical implications of these finding using the Yaruss and Quesal (2004) model components as

a framework. Each component within the Yaruss and Quesal (2004) model (Impairment in Body Function, Personal Reactions/Factors, Environmental Factors, and Quality of Life) will be reviewed separately followed by a review of the various relationships and interactions between these biopsychosocial components.

#### **5.4.1 Impairment in Body Function**

In this study, as in Chapter 3, severity of stuttering (%SS) and self-awareness and knowledge of stuttering experience (OASES-SI) were measured to reflect the children's and adolescent's impairment in body function.

Children and adolescents who stuttered displayed a significant positive relationship between stuttering severity (%SS) and self-awareness and knowledge of their stuttering experience (OASES-SI) through correlation analyses. This finding, as in Chapter 3, consistently demonstrated how children and adolescents with a higher severity of stuttering appear to possess more self-awareness and increased knowledge regarding their stuttered speech.

Researchers have previously documented that children who stutter are aware of their stuttering shortly after its onset, which has the potential to affect their social interaction from an early age (Ambrose & Yairi, 1994; Packman et al., 2003). Children as young as 3 to 4 years of age who stutter have been found to experience more negative attitudes towards speech than their fluent peers, and these attitudes appear to exacerbate with age and stuttering severity (De Nil & Brutten, 1990, 1991; Vanryckeghem, 1995; Vanryckeghem & Brutten, 1997; Vanryckeghem et al., 2001, 2005). Each child and adolescent assessed in this study had formerly been provided with speech pathology therapy but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore it is plausible that the children and adolescents who continue to stutter despite previous unsuccessful treatment develop a

strong positive interactive relationship with self-awareness and knowledge of their stuttering experience.

The biopsychosocial perspective which has been taken within this thesis proposes that overt stuttering behaviours may not be the singular most important factor for people who stutter (Manning, 2001; Shapiro, 1999; Yaruss et al., 2002; Yaruss & Quesal, 2004; 2006; 2008). Most individuals also experience a myriad of negative consequences associated with their speech disorder and the impact of these psychosocial variables can be described in terms of personal factors/reactions, environmental factors and quality of life.

#### **5.4.2 Personal Factors / Reactions**

##### **5.4.2.1 State, Trait and Social Anxiety**

Children who stuttered (Pre-Group) demonstrated statistically high state and social anxiety compared to children who stuttered (Wait-List) with clinically high state, trait and social anxiety levels scoring above published normal clinical limits. As discussed in Chapter 3, this finding is particularly noteworthy because it is inconsistent with the majority of previous research (Craig and Hancock, 1996; Andrews & Harris, 1964). Craig and Hancock (1996) found no differences in either state or trait anxiety between children who stuttered and age matched fluent peers, while Andrews and Harris (1964) found no differences between CWS and CWNS using a general anxiety scale for children.

Adolescents who stutter (Pre-Group) displayed significantly higher state, trait and social anxiety than adolescents who stutter (Wait-List), with these higher levels scoring above published normal clinical limits. In Chapter 3, it was reported that these findings once more demonstrate some interesting inconsistencies with previous research (Craig and Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008). Craig

and Hancock (1996) found no significant differences in either state or trait anxiety between adolescents who stutter and age matched fluent peers. Blood et al. (2007) administered the Revised Children's Manifest Anxiety Scale (RCMAS) (Reynolds & Richmond, 2002) to 36 adolescents who stutter and 36 fluent peers aged 12 to 18 years and found that adolescents who stutter, although generally evidencing higher levels of generalised anxiety than their fluent peers, still scored within normal limits. Davis et al. (2007) examined state and trait anxiety in adolescents who stutter with the results suggesting that adolescents who stutter have higher state anxiety than their fluent peers, however they found no differences in trait anxiety between adolescents who stutter, adolescents who had recovered from stuttering, and fluent peers aged between 10 and 17 years. Mulcahy et al. (2008), examined state and trait anxiety in adolescents who stutter with results suggesting that adolescents who stutter have higher state and trait anxiety than do their fluent peers, however the higher levels of state and trait anxiety still scored within normal clinical limits.

These previous published studies (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety in people who stutter may in fact be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005).

The significant differences between these results obtained (current study and Chapter 3) and the results of other researchers may lie in the nature of the population of children and adolescents who were assessed in this study. As described previously, these children and adolescents who stuttered were referred by clinicians and parents to



an innovative specialised holistic biopsychosocial program specifically run by the Curtin University Stuttering Treatment Clinic. This is a centre offering specialised clinical expertise and is respected as a second opinion clinic for previously unsuccessful treatments. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success.

Craig (1990) found that adults who stuttered experienced state anxiety specific to speaking situations prior to treatment, as well as overall higher levels of trait anxiety than adults who did not stutter, regardless of whether they had had treatment or not. Further, Craig et al. (2003) found higher levels of generalised anxiety in severely affected adults who stutter and who had previously been involved in or who were currently receiving treatment. Children and adolescents in this study had previously been enrolled in speech pathology treatment for their stuttering and they were awaiting a specialised biopsychosocial group therapeutic program. Hence, these results allowed for clear examination of anxiety in the clinical population of children and adolescents who stutter who need and are awaiting imminent therapeutic assistance. An accurate examination of previous demographic treatment factors in individuals who stutter should be considered in future research to account for possible treatment impact effects.

As mentioned previously, there are limited studies in the literature which have looked at social anxiety or fear of negative evaluation in adolescents and children who stutter. This study replicates and extends the findings in Chapter 3, in that these results suggest that social anxiety, or the fear of being negatively evaluated, does not contribute uniquely to the profile of children and adolescents who stutter. Social anxiety correlated significantly with state and trait anxiety measures in children and state anxiety measures in adolescents. Thus, these results are inconsistent with the argument that social anxiety may be a more focussed way of measuring anxiety in children and

adolescents who stutter (as opposed to traditional state and trait anxiety measures). Further, they suggest that an interaction between different components of anxiety may be a more helpful way of viewing the relationships (Endler et al., 1991).

Mulcahy et al. (2008) investigated adolescents and found statistically significant higher scores reported on the Fear of Negative Evaluation (FNE) scale compared to fluent peers, although the scores were still classified within normal clinical limits. In addition, although the researchers reported a significant correlation between FNE and trait anxiety, there was no significant correlation between the FNE and state anxiety. The differences between this current study and the study reported by Mulcahy et al. (2008) may lie in the measure used to assess social anxiety or fear of negative evaluation and the sample population of adolescents used within each study.

In the current study, the BFNE-II (Carleton et al., 2006) was used which is a modified version of the FNE scale and comprises 12 worded in a clear manner using a 5 point Likert-scale providing a greater range of responses. By contrast, the FNE scale used in the Mulcahy et al. (2008) study, asked participants to respond using a binary true/false response. This may not have been as sensitive in detecting similar differences and relationships in adolescents given the nature of the FNE scale used. In the Mulcahy et al. (2008) study the authors called for the use of the Likert-scale version of the BFNE-II in future research which is indeed what was used in this current study. In the current study, as detailed previously, the adolescents who stutter were a clinical population for whom previously provided speech pathology therapy had been deemed by either the clinician or parents not to have achieved significant improvement or success. In contrast, the adolescent cohort studied by Mulcahy et al. (2008) was a random sample of adolescents who stutter obtained from the community. Therefore it may be plausible that the difference between our results and those obtained by Mulcahy

et al. (2008) may in part be a reflection of this particular cohort of adolescents seeking assistance.

The clinical significance of the collective results from Chapters 3 and 5 suggest that children and adolescents who stutter may be at risk of developing higher levels of anxiety than their fluent peers and that these levels of anxiety may necessitate clinical management that specifically relates to anxiety.

Longitudinal research examining the development of anxiety across the lifespan of the individual who stutters may be useful in further identifying the role of anxiety in the stuttering disorder, including whether anxiety develops on a parallel course or increases with an expanding trajectory with stuttering behaviour.

#### 5.4.2.2 Reactions to Stuttering

Children and adolescents who stutter (Pre-Group) displayed consistently higher reactions to their stuttering (OASES-SII) than did children and adolescents who stutter (Wait-List) with an impact rating of moderate-to-severe. The collective results from Chapters 3 and 5 further supports the premise that CWS and AWS are experiencing consistently pronounced affective, behavioural and cognitive reactions to their speaking capacities.

It has been noted in the literature that CWS and AWS may experience a variety of emotional reactions to their stuttering (e.g., Cooper, 1993; DeNil & Brutten, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutten, 1996; 1997; Watson, 1988; Yaruss, 1998; Yaruss & Quesal, 2004, 2006) and the current study further endorses this claim. Between the Wait-List and Pre-Group time-points (8 weeks apart), the children and adolescents who stutter do not appear to have gained any additional coping skills for managing these strong emotions.

It has also been reported clinically and documented within the literature those individuals who stutter exhibit behavioural reactions to stuttering including physical tension as they force their way through moments of stuttered speech (e.g., Johnson, 1961; Van Riper, 1982; Wingate, 2002). In addition, speaking avoidance and escape behaviours have also been documented (Plexico et al., 2009). Such behaviours constitute the child or adolescent's attempts to minimise exposure to difficult speaking situations such as reading aloud in front of an audience or answering public requests for information. Although these avoidance behaviours may minimise stuttering in the short-term, the child or adolescent who continues to avoid speaking situations is limited in participating in key activities that are important for educational or social development (Murphy, Quesal, & Gulker, 2007). The statistically significant higher behavioural reactions documented in this study pose challenges to these CWS and AWS and need to be addressed as a clinical priority.

Researchers have documented negative cognitive reactions for these young people including low self-esteem, diminished self-confidence, and reduced feelings of self-efficacy (Blood & Blood, 2004; Healey & Scott, 1995; Manning, 2001; Ramig & Bennett, 1995; 1997; Ramig & Dodge, 2005; Reardon-Reeves & Yaruss, 2004; Starkweather & Givens-Ackerman, 1997; Vanryckeghem et al., 2005; Yaruss, 1998; Yaruss & Quesal, 2004; 2006). In addition, diminished self-esteem and low self-confidence, which impacts on social discourse and interpersonal interactions, has also been detailed. The results from this study reinforce the premise that CWS and AWS have statistically significant higher cognitive reactions than do their fluent peers.

These high personal reactions need to be addressed as a clinical priority given that some children and adolescents who stutter do not appear to possess the necessary coping skills or strategies.

### **5.4.3 Environmental Factors**

Children and adolescents who stutter (Pre-Group) displayed significantly higher behavioural, social and communication difficulties than children and adolescents who stutter (Wait-List). This finding is supported by previous research that indicates across the developmental span, preschoolers, adolescents and adults who stutter possess traits that differentiate them from the fluent population. People who stutter have been found to be more socially anxious, sensitive and insecure, possess poorer attention, and experience lower emotional regulation than the general population (e.g., Anderson et al., 2003; Blood et al., 2001; Fowlie & Cooper, 1978; Karass et al., 2006; Mulcahy et al., 2008).

In addition, it has been proposed in the literature that difficulties in communicating in daily situations may be the result of conditioning that occurs when a neutral communication situation is associated with negative and aversive consequences (Daly et al., 1997). As a consequence of the negative evaluation which has been associated with stuttering over time, it is not surprising that results from this current study reported children and adolescents who stuttered to experience greater difficulties with communication in daily situations.

The collective results from Chapters 3 and 5 further support and underpin the fact that children and adolescents who stutter experience difficulties in their school, social and home environments and support the notion that stuttering is more than just its surface behaviours. While the speech breakdown is fundamental, this stuttering disorder is intertwined with other domains including psychosocial, emotional and environmental factors (Karass et al., 2006; Yairi, 2007).

The results from this study reinforce the need for treatment program which are designed for children and adolescent and incorporate strategies and techniques to assist these young people with their communication difficulties in daily situations. The use of

task and situational hierarchies and generalisation plans within treatment programs ensure that speakers can use techniques across a variety of situations (Brutten & Shoemaker, 1967; 1974; Darley & Spriestersbach, 1978; Shumak, 1955; see also Hillis & McHugh, 1998; Ingham & Onslow, 1987). The use of hierarchies in the ‘Smooth Speech and Cognitive Behavior Therapy’ and ‘Comprehensive Treatment’ programs detailed in Chapter 1 of this thesis were structured and were used both in the initial learning of complex behaviours and in the systematic generalisation of these behaviours to everyday real-life situations. The premise behind this multi-disciplinary holistic approach to treatment is to not only effectively assist children and adolescents who stutter improve their fluency, but also to reduce the negative impact that this stuttering disorder has on their communication in daily activities and participation in life.

#### **5.4.4 Quality of Life**

Children and adolescents who stutter (Pre-Group) displayed significantly reduced quality of life scores than children and adolescents who stutter (Wait-List).

While it has been noted by researchers that quality of life is a potentially important measure when assessing the impact of stuttering (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), there is very limited literature assessing the impact of stuttering on quality of life in children and adolescents.

The authors reported that these findings in adults had important therapeutic implications for the treatment of children who stutter. Based on the assumption that the negative impact of stuttering on quality of life may be the consequence of chronic stuttering over time (Bloodstein & Bernstein Ratner, 2008), researchers have stated that it is imperative that treatments for children and adolescents improve so that fewer children and adolescents who grow up into adults still stutter at elevated or severe levels (Craig et al., 2009).

It has been emphasised in other sections of this thesis that the significant differences between the results obtained within this study and the results of other researchers may lie in the population of children and adolescents who stutter who were assessed in this study. These children and adolescents were referred by clinicians and parents to the Curtin University Stuttering Treatment Clinic. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore it may be plausible that the level of impact on each of the psychosocial variables discussed so far may in part be a reflection of this particular cohort of children and adolescents seeking assistance.

In the previous section of this discussion, the impact of the stuttering disorder on separate component within the Yaruss and Quesal (2004) model has been reviewed and discussed. The next section of this discussion will review and evaluate the various inter-relationships and interactions between the measured biopsychosocial variables within each model component that have been studied in children and adolescents who stutter.

#### **5.4.5 Impairment in Body Function and Personal Factors/Reactions**

##### **5.4.5.1 Relationship between State and Trait Anxiety and %SS**

In addition to the finding that children and adolescents who stuttered had significantly higher state and trait anxiety compared to published normative values, the consistent findings thus far (Chapter 3 and current study) support the premise that anxiety may play a mediating role in exacerbating stuttering behaviours (as suggested by Conture et al., 2006; Davis et al., 2007; Messenger et al., 2004). In the CWS and AWS (Pre-Group), severity of stuttering was positively correlated with trait anxiety. As

mentioned in Chapter 3, this finding is new and significant and has not been demonstrated in the literature for children and adolescents who stutter to date.

If anxiety is an aetiological contributor to developmental stuttering, it would be assumed that greater anxiety would engage more severe stuttering. The collective results from Chapters 3 and 5 which demonstrate a positive association with stuttering severity support such a postulated relationship. In addition, the mean scores for the group of children and adolescents who stuttered were above the published normal clinical range for each of these anxiety measures further suggesting that the level of anxiety can be classified impacting significantly on normal functioning (Spielberger, 1973; 1983; Watson & Friend, 1969) and therefore in all probability contributing to an increase in the severity of stuttering.

As discussed previously, reviews of the results obtained by researchers in adults who stutter (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait may be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). In short, there are reasons to believe that there may be a relationship between stuttering, state and trait anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004). The results from this study support this premise.



#### 5.4.5.2 Relationship between State and Trait Anxiety and OASES-SI

Consistent with the results reported in Chapter 3, in CWS, state and trait anxiety were demonstrated to be independent of self-awareness of stuttering (OASES-SI) through statistical correlation and regression analyses. By contrast, in AWS, both state and trait anxiety were positively correlated with self-awareness of stuttering (OASES-SI) and trait anxiety was a significant predictor of OASES-SI in the regression analyses.

Children and adolescents who stutter (Chapter 3 and current study) have been shown to have significantly higher state and trait anxiety than their fluent peers with these higher levels scoring above normal clinical limits. Adolescents who continue to stutter despite previous treatment also appear to develop an increased self-awareness of their stuttering which is related to elevated state and trait anxiety. It is plausible that an increase in the development of self-awareness of stuttering occurs during the time span between childhood and adolescents which in turn may exacerbate both state and trait anxiety levels. Adolescents appear to become increasingly aware of negative listener reactions and their desire to hide stuttering increases as they experience repeated communication failures during peer interactions (Dell, 2000). For adolescents who need to feel accepted by peers and to develop an association with peer groups, their self-awareness of their stuttering impact significantly on their anxiety levels. These results obtained during childhood and adolescence contribute to an important developmental period for individuals who stutter, especially with regards to knowledge and conscious self-awareness of stuttering and its relationship to state and trait anxiety.

#### 5.4.5.3 Relationship between Social Anxiety and %SS

Consistent with Chapter 3, children and adolescents who stuttered had significantly higher social anxiety compared to their fluent peers. However, social anxiety scores were independent of severity of stuttering in correlation and regression

analyses. These results do not lend support to the proposal that social anxiety plays a mediating role in exacerbating stuttering behaviours (as suggested by Conture et al., 2006; Davis et al., 2007; Messenger et al., 2004). The implication is that rather than social anxiety playing a mediating role, it may in fact be a by-product of the stuttering disorder.

It has been reported that children and adolescents who have been stuttering for some time develop advanced techniques to cope with and conceal their disorder (Floyd et al., 2007). In this current study and in Chapter 3, it is possible that severity was not transparent because strategies used to facilitate fluency (such as word avoidance and circumlocution) concealed a true representation of conversational speech. Individuals who stutter and who are in an anxious state frequently worry about threat and try to develop effective strategies to reduce anxiety to achieve their goal (Eysenck et al., 2007; Plexico et al., 2009). It is possible that speech-related anxiety suppressed a true representation of stuttering surface features. Further research should examine the associations between disclosure of avoidant behaviours and strategies and stuttering surface behaviours in children and adolescents who stutter.

#### 5.4.5.4 Relationship between Social Anxiety and OASES-SI

In current study and Chapter 3, social anxiety was shown to be positively related with self-awareness of stuttering through correlation and regression analyses in CWS and AWS. Children and adolescents who continue to stutter despite previous treatment appear to develop an increased self-awareness of their stuttering which is related to an increased anxiety in social situations. Children and adolescents who stutter appear to have heightened differences in communication skills resulting in more sensitivity to negative listener reactions. Such young people may become more socially anxious as they experience repeated communication failures during peer interactions (Dell, 2000).

The current results obtained during childhood and adolescence contributes knowledge about self-awareness of stuttering and its relationship to social anxiety.

This result is also an indication that when measuring the 'Impairment in Body Function' component of the stuttering disorder, different assessments within the biopsychosocial components may disclose different but important perspectives with respect to the impact of the stuttering disorder. This reinforces the proposal that a broader conceptualisation of the stuttering disorder is needed in assessment and treatment.

#### 5.4.5.5 Relationship between Reactions to Speaking Ability and %SS

In children who stuttered, a significant positive relationship between reactions to stuttering and severity of stuttering was demonstrated in correlation and regression analyses. This finding reinforces the premise that feelings, behaviours and thoughts are affected by stuttered severity and this inter-relationship develops and strengthens progressively over the life-span.

The children and adolescents in this study who continued to stutter despite previous unsuccessful treatment appear to have developed negative affective, behavioural and cognitive reactions to their stuttering which is consistent with what is proposed by other researchers (e.g., Yaruss, 1998; Cooper, 1993; DeNil & Brutton, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutton, 1996; 1997; Watson, 1988; Yaruss & Quesal, 2004, 2006).

This finding reinforces the premise of the Yaruss and Quesal (2004) model that feelings, behaviours and thoughts are impacted by the stuttered severity and this inter-relationship develops and strengthens progressively over the life-span. Therapeutically,

it follows that the incorporation of strategies to manage these personal reactions is a necessary part of a holistic approach to stuttering therapy in children and adolescents.

#### 5.4.5.6 Relationship between Reactions to Speaking Ability and OASES-SI

Consistent with the results presented in Chapter 3 (Wait-List), in both children and adolescents who stuttered (Pre-Group), a significant positive relationship was demonstrated between reactions to stuttering and self-awareness of stuttering through correlation and regression analyses. As mentioned previously, this important finding has not been previously reported in the literature.

The children and adolescents in this study who continue to stutter despite previous unsuccessful treatment and are aware of their stuttering behaviour also experience negative affective, behavioural and cognitive reactions to their stuttering. As the children and adolescents who stutter become aware of the differences between their communication skills and the communication skills of their fluent peers, amplification of their affective, behavioural and cognitive reactions may occur.

The results in this study poignantly highlight that children and adolescents who continue to stutter despite previous unsuccessful treatment appear to develop a self-awareness of their stuttering experience which in turn has a strong relationship with negative affective, behavioural and cognitive reactions.

### **5.4.6 Impairment in Body Function and Environmental Factors**

#### 5.4.6.1 Relationship between Behavioural and Social Difficulties and %SS

Consistent with findings in Chapter 3 at the Wait-List time-point, these findings support a significant positive relationship between behavioural and social difficulties and severity of stuttering in CWS. There was no such relationship in AWS between behavioural and social difficulties and severity of stuttering. Again, the unique results

have not been demonstrated previously in the literature for children and adolescents who stutter.

In contrast to younger children who stutter, the adolescents in this study did not exhibit a significant relationship between behavioural and social difficulties and severity of stuttering. This may be due to adolescents engaging in more covert and innovative sublimating behaviours and social strategies in order to facilitate fluency or decrease the assessed severity of their stuttering. Adults who stutter consistently use word avoidance and circumlocution to manage their conversational speech and teenagers may also restrict communication situations and engage in social isolation (Plexico et al., 2009)

The results presented in the current study further supports and underpin the premise that children and adolescents who stutter experience more difficulties compared to their fluent peers in their school, social and home environments and support the notion that stuttering is more than just its surface behaviours. While speech disfluency is an essential feature, this stuttering disorder is intertwined with other domains including psychosocial, emotional and environmental factors (Karass et al., 2006; Yairi, 2007). The results thus far support the argument for the adoption of a broader conceptualisation of stuttering when considering the assessment and treatment in children and adolescents.

The general behavioural and social difficulties experienced by the children and adolescents who stutter in this group evolved into a psychosocial theme for the clinical intervention of the Fluency & Confidence group program.

#### 5.4.6.2 Relationship between Behavioural & Social Difficulties & OASES-SI

In CWS and AWS, behavioural and social difficulties and knowledge and self-awareness of stuttering were demonstrated to be independent through correlation analyses. Again, this result may be due to children and adolescents engaging in more

covert and innovative sublimating behaviours and social strategies in order to facilitate fluency or decrease the assessed severity of their stuttering.

In a related process, it is highly probable that the development and presence of stuttering in children and adolescents, which was resistant to previous treatment, has enhanced their self-awareness of their stuttering and this awareness has further exacerbated or maintained these inherently vulnerable behavioural and social qualities.

Therefore, the clinical implications of assisting the children and adolescents who stutter with learning techniques and coping strategies which empower them in tackling their stuttering disorder provides direct clinical directions for intervention needs.

#### 5.4.6.3 Relationship between Communication Difficulties and %SS

Consistent with the findings reported in Chapter 3 (Wait-List) in CWS, a significant positive correlation between difficulties in daily communication and stuttered severity was demonstrated whereas no such relationship was demonstrated in AWS.

Predictably, if a person encounters persistent difficulty in communicating in daily situations the negative evaluation that occurs over time becomes conditioned. It has been proposed that the effects of stuttering often increase as children reach the early adolescent years. Peer pressure and acceptance to conform become major factors in the social life of the young child (Blood & Blood, 2004; Davis et al., 2002; Langevin, 1997, 2000; Langevin et al., 1998; Murphy & Quesal, 2002; Murphy, Yaruss. & Quesal, 2007a, 2007b; Yaruss et al., 2004). Clinically, it is common for the inappropriate actions of others to be the catalyst for children who are experiencing difficulty communicating effectively to seek therapeutic assistance. These findings need to drive clinical goals for intervention for these young people.

#### 5.4.6.4 Relationship between Communication Difficulties & OASES-SI

In both the Wait-List time-point (Chapter 3) and this study (Pre-Group), a strong significant positive relationship between difficulties in daily communication and self-awareness of stuttering was demonstrated through correlation and regression analyses in both the children and adolescent cohorts. This relationship highlights how insights evolve into coping strategies including the limitation and restriction of verbal output. Such a relationship has not been demonstrated in the literature for children and adolescents who stutter before.

These findings support the position that self-awareness and insight in children and adolescents who stutter can be used as a possible clinical agent. The self-awareness of the children and adolescents who stutter can be supported and supplemented through self-empowerment techniques to have a positive impact on the communication difficulties that they are experiencing in various speaking environments that they have previously avoided.

### 5.4.7 Impairment in Body Function and Quality of Life

#### 5.4.7.1 Relationship between Quality of Life and %SS

Children and adolescents who stuttered displayed significantly lower quality of life than their fluent peers. Consistent with the findings documented in Chapter 3, children who stutter but not adolescents who stutter, demonstrated a significant positive relationship between reduced quality of life and severity of stuttering through correlation and regression analyses.

While it has been noted by researchers that quality of life is a potentially important measure when assessing the impact of stuttering (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), quality of life research assessing the impact of stuttering in children and adolescents is limited. It has been reported by researchers investigating the impact of the stuttering disorder on quality of life in adults who stutter

that these findings have important therapeutic implications for the treatment of children who stutter. These authors posit that it is vital that treatments for children and adolescents improve and incorporate a more holistic therapeutic approach to reduce the likelihood of these children and adolescents growing up into adults who still stutter at elevated or severe levels (Craig et al., 2009).

This result in adolescents who stutter reinforces the premise that the impact that stuttering can have on an individual is often much more than the surface characteristics, and it is apparent during adolescence that this relationship is much more complex and needs to serve as a treatment focus for intervention.

#### 5.4.7.2 Relationship between Quality of Life and OASES-SI

Consistent with the results documented in Chapter 3 (Wait-List), in both CWS and AWS (Pre-Group), a significant positive relationship between reduced quality of life and self-awareness of stuttering was demonstrated through correlation and regression analyses. This finding posits that quality of life is adversely affected by self-awareness of weaknesses in speaking abilities in children and adolescents who stutter. For the young people in this study, the contrast with their fluent peers in life enjoyment and expectancy is clearly demonstrated. This result has previously not been demonstrated in the literature for children and adolescents who stutter to date.

It is evident from the results that at such a formative time in their social and emotional development coupled with the need to interface with society at large, these young people are suffering and the resultant impact on their quality of life appears to have evolved.



## **5.4.8 Personal Factors/Reactions and Enviromental Factors**

### **5.4.8.1 State and Trait Anxiety and Behavioural and Social Difficulties**

Although CWS and AWS displayed significantly higher and clinical levels of state and trait anxiety and behavioural and social difficulties than fluent peers, the state and trait anxiety levels were independent of the behaviour and social difficulties.

In this cohort of children and adolescents measured prior to commencing the Fluency & Confidence treatment program, an independent relationship existed between the state anxiety scores and the behaviour and social difficulties scores, whereas a positive relationship was demonstrated for children and adolescents between the trait anxiety scores and the behaviour and social difficulties scores. This relationship in children who stutter between the trait anxiety scores and the behaviour and social difficulties scores is different to the result documented in CWS at the Wait-List (Chapter 3). It is possible that for the CWS, the prospect of commencing a group treatment program may have enhanced the relationship between their trait anxiety and behaviour and social difficulties. This result reflects the interactive relationship between these multi-factorial biopsychosocial factors. The impact of stuttering on the child or adolescent who stutters encompasses much more than the surface characteristics, it is by its very nature, multi-dimensional with each component requiring separate investigation. The individual components then should become combined as a group focus for intervention.

### **5.4.8.2 Social Anxiety and Behavioural and Social Difficulties**

In keeping with the results documented in Chapter 3 (Wait-List), a significant positive relationship between social anxiety and behavioural and social difficulties was demonstrated. This relationship between social anxiety and behaviour and social difficulties reflects tumultuous times in the lifespan of childhood and adolescents which

is made more difficult given the clinical social anxiety levels experienced by the young people who stuttered in this study.

The significant relationships between these psychosocial variables reinforce the need for anxiety reducing, confidence enhancing and social life skills therapies when treating children and adolescents who stutter. Such interventions would address functional communication limitations and empower the children and adolescents through improved confidence and social skills. Although the specific content and success of such treatments are yet to be identified, the findings from this study suggest that a biopsychosocial approach to intervention would be most effective.

#### 5.4.8.3 Reactions to Speaking Ability and Behavioural and Social Difficulties

In CWS, the reactions to speaking abilities were independent of behaviour and social difficulties; however in AWS, speaking abilities was positively correlated with behaviour and social difficulties. The developmental difference between CWS and AWS may reflect the longer period of time that adolescents experience stuttering with limited coping strategies to manage their emotional, behavioural and cognitive reactions and we may be observing the resultant behavioural and social difficulties evolving developmentally.

These results provide further support for the proposal that personal and environmental impact factors may reflect separate multi-factorial components of the children and adolescent stuttering experiences. Once more these findings constitute reinforcement for the premise that the impact of stuttering on the child or adolescent goes beyond surface characteristics. The results in this study poignantly highlight that children and adolescents who continue to stutter despite previous unsuccessful treatment develop limited passive coping strategies which assist them to navigate the tumultuous stuttering experience.

#### 5.4.8.4 State and Trait Anxiety and Daily Communication Situations

In children and adolescents who stutter, state and trait anxiety was significantly and positively correlated with communication difficulties in daily situation. Such a relationship represents a measure of potential future mental health concerns.

Considering the results of this study, and those of Mulcahy et al. (2008), who also demonstrated a statistically significant relationships between trait anxiety and communication difficulties in adolescents who stutter, it is possible to conclude that trait anxiety plays a particularly significant developmental role in stuttering. Previous clinical researchers have demonstrated in adults who stutter that trait anxiety is significantly elevated compared to their fluent peers (Craig et al., 2003). Therefore, these findings may suggest a delineated longitudinal timeframe for the nature of this relationship between trait anxiety and communication difficulties.

A common consensus of results of previous studies investigating anxiety and stuttering (Craig & Hancock, 1996; Blood et al., 2007; Davis et al., 2007; Mulcahy et al., 2008) suggest that state and trait anxiety in people who stutter may in fact be age-dependent. More specifically, the suggestion is made that children who stutter are not born with inherently elevated levels of trait anxiety, but rather, through the ongoing experience of living with the fluency disorder, and actual or perceived negative communicative encounters, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005). Therefore clinically, there are reasons to believe that there may be a relationship between stuttering and anxiety in children and adolescents who stutter that is theoretically and clinically important yet to date remains equivocal (Craig & Hancock, 1996; Craig & Tran, 2005; Messenger et al., 2004).

#### 5.4.8.5 Social Anxiety and Daily Communication Situations

Consistent with the results in Chapter 3, in CWS and AWS, this association was further confirmed by the finding that social anxiety was statistically significantly and positively correlated with a poorer communication attitude amongst the children and adolescents who stuttered.

A negative attitude to communication is thought to perpetuate social anxiety (Blood et al., 2001; Davis et al., 2007; Kraaimaat et al., 2002; Messenger et al., 2004). It has been proposed that a poorer attitude to communication may be the result of conditioning that occurs when neutral communication activity is associated with negative and aversive consequences (Daly et al., 1997). Given the negative evaluation that has been associated with stuttering over time, it is not surprising that results from this current study and the data presented in Chapter 3 indicate that children and adolescents who stuttered reported higher levels of social anxiety and a poorer attitude to communication in everyday natural situations.

#### 5.4.8.6 Reactions to Speaking Ability and Daily Communication Situations

Consistent with results obtained from the same CWS and AWS 8 weeks earlier (Chapter 3), in CWS and AWS, a strong positive relationship was demonstrated between reactions to stuttering and difficulties in communication situations. These results reinforce the premise that children and adolescents who stutter are experiencing more affective, behavioural and cognitive distress concerning their speaking ability. These personal reactions pose particular challenges for children and adolescent who stutter who consistently do not appear to possess the necessary coping skills for managing such strong affective, behavioural and cognitive reactions.

## **5.4.9 Personal Factors/Reactions and Quality of Life**

### **5.4.9.1 State and Trait Anxiety and Quality of Life**

In CWS, the association between anxiety measures and quality of life was confirmed by the finding that levels of state anxiety were positively related with a poorer quality of life, whereas trait anxiety was independent. In AWS, this association was confirmed by the finding that both state and trait anxiety were positively related with a poorer quality of life.

These results reinforce the proposal that the stuttering disorder in children and adolescents can have far-reaching and sometimes devastating effects on their life. It has been demonstrated in these children and adolescents who stutter that the stuttering disorder has impacted on their overall quality of life; clinical levels of anxiety; affective, behavioural and cognitive reactions; and their ability to communicate effectively in daily living situations compared to their fluent peers.

As stated previously, researchers have posited that quality of life is a potentially important measure when assessing the impact of stuttering and the efficacy or effectiveness of therapeutic treatments (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), however the impact of stuttering on quality of life has only recently been undertaken in adults who stutter (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Franic & Bothe, 2008; Craig et al., 2009).

Researchers investigating anxiety and stutter have proposed that children who stutter are not born with inherently elevated levels of anxiety, but rather, through their ongoing experience of living with the fluency disorder, develop adverse attitudes towards communication and particularly communicative interactions, causing augmented state anxiety to crystallise into chronic anxiety (Craig & Tran, 2005) and long-term negative impact on their quality of life (Craig et al., 2009).

This finding in children and adolescent who stutter of a positive relationship between state anxiety and quality of life has implications for the assessment and treatment of children and adolescents who stutter with specific emphasis on assessing and treating the collective biopsychosocial consequences of stuttering. Research to date focusing on the treatment of children and adolescents who stutter has relied heavily on the assessment and treatment of the stuttered behaviours with less emphasis on the psychosocial aspects of the stuttering disorder.

#### 5.4.9.2 Social Anxiety and Quality of Life

Consistent to the results obtained in Chapter 3 (Wait-List) in CWS and AWS, the association between social anxiety and quality of life was confirmed by the finding that levels of social anxiety were positively related with a poorer quality of life.

This fear of being negatively evaluated by others, particularly in social situations, is described as social anxiety (Messenger et al., 2004). In individuals who stutter, social anxiety is not surprising, given the likely negative evaluation of speech that has been experienced for some time (Messenger et al., 2004). Therefore it is not surprising that the long-term negative evaluation of speech may be related to poorer quality of life in these children and adolescents. As noted previously, these children and adolescents were referred to and were awaiting commencement of the Fluency & Confidence group program. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success. Therefore each child and adolescent had experience period of time in their life in which their speech had been negatively evaluated.

The correlation between these psychosocial variables highlights the clinical impact that stuttering has on the young person's life. These types of results send a clear

message to clinicians to assist the child and adolescent who stutters by providing them with the therapeutic techniques and tools they require.

#### 5.4.9.3 Reactions to Speaking Ability and Quality of Life

The results obtained in this study were again consistent with the results that were obtained in the same cohort of CWS and AWS 8 weeks earlier. In CWS and AWS, the association between reactions to stuttering (OASES-SII) and quality of life was confirmed by the finding that higher emotional, behavioural and cognitive reactions to their speaking abilities were positively related with a poorer quality of life demonstrated through correlation analyses. This result further reinforces how social discourse is the mode through which human beings navigate relationships in society.

The results obtained in this study support the premise that children and adolescents who stutter are experiencing more statistically significant affective, behavioural and cognitive distress and reactions concerning their speaking abilities and these elevated personal reactions to their speaking ability have a strong relationship with their quality of life.

It has been noted in the literature that children and adolescents who stutter experience a variety of emotional reactions to their stuttering (e.g., Cooper, 1993; DeNil & Brutten, 1991; Guitar, 2006; Logan & Yaruss, 1999; Manning, 2001; Shapiro, 1999; Sheehan, 1970; Vanryckeghem & Brutten, 1996; 1997; Watson, 1988; Yaruss, 1998; Yaruss & Quesal, 2004, 2006) and the current study supports this claim. Further, in this study, these emotional reactions appear to pose particular quality of life challenges for these children and adolescents who stutter and they do not appear to possess the necessary coping skills for managing these strong emotions.

#### **5.4.10 Environmental Factors and Quality of Life**

##### **5.4.10.1 Behaviour and Social Difficulties and Quality of Life**

In CWS and AWS, the association between behaviour and social difficulties and quality of life was confirmed by the finding that an increase in behaviour and social difficulties were correlated with a poorer quality of life. Parents of children who stutter consistently report greater behavioural problems in their children compared to those parents whose children do not have communication problems (Fowlie & Cooper, 1978; Karrass et al., 2006). The need for the intensive parent support program identified in Chapter 2 is highlighted by these findings.

##### **5.4.10.2 Communication Difficulties in Daily Situations and Quality of Life**

Collective results from Chapters 3 and 5, for CWS and AWS, confirm the correlations between communication difficulties and quality of life. It has been proposed in the literature that difficulties in communicating in daily situations may be the result of conditioning that occurs when a neutral communication situation is associated with negative and aversive consequences (Daly et al., 1997). Given the negative evaluation that has been associated with stuttering over time, it is not surprising that results from this current study reported children and adolescents who stuttered to experience difficulties with communication in daily situations.

In children and adolescents who stutter, the association between communication difficulties and quality of life was also confirmed by the correlation analyses demonstrating a statistically significant positive relationship between communication difficulties and a reduced quality of life. Such results underscore the significance that society places on fluent, articulate communication across all situations in society and the resulting impact that this pressure places on the child or adolescent.

The focus on total and effective communication challenges clinicians to develop appropriate treatments for children and adolescents which enhance and empower their



communication skills through situational hierarchies and generalisation plans to ensure that speakers can use techniques across a variety of communication situations (Brutten & Shoemaker, 1967; 1974; Darley & Spriestersbach, 1978; Shumak, 1955; see also Hillis & McHugh, 1998; Ingham & Onslow, 1987). Ultimately, effectively coping with stuttering involves a myriad of support. The biopsychosocial framework posed by Yaruss and Quesal (2004) emphasises the inherently powerful relationship that the environment has on the person and ultimately on their ability to cope effectively in their daily interactions. This model also emphasises the importance of support networks and relationships that PWS have and the impact they have on the person's ability to function in the real world.

#### **5.4.11 Biopsychosocial Model of Stuttering**

Finally, using the data obtained from the children and adolescents in this study at the Pre-Group time point, we investigated the factor structures of the assessment and questionnaire tools that were used in order to determine how discriminately the data mapped onto the model proposed by Yaruss and Quesal (2004). As mentioned previously, this type of exploratory factor analysis of the assessment and questionnaire data obtained has not previously been addressed in the literature for children and adolescents who stutter.

The factor structure which evolved from this exploratory analysis was consistent with that presented in Chapter 3 demonstrating a high degree of replicability. For children, a single factor was identified as accounting for almost 58% of the variance in the Impairment in Body Function component. Notably, two factors of 'personal reactions' and 'anxiety' underlay the assessment and questionnaire measures used for the Personal Reactions/Factors component and collectively accounted for almost 69% of the variance in the this domain. Again, a single factor accounted for almost 58% of

the variance in the assessment and questionnaire data of the Environmental Factors component. Finally, a single factor was identified as accounting for almost 71% of the variance in the assessment and questionnaire data for the Quality of Life component. The authenticity of the data was clearly superimposed onto the model proposed by Yaruss and Quesal (2004).

In the case of adolescents, again the factor structure which evolved from this exploratory analysis was consistent with that presented in Chapter 3. For adolescents, the structures of the components were more complicated in the Impairment of Body Function and Environmental Factor components reflecting the diversity and challenges that arise developmentally over time. Two factors of ‘impairment’ and ‘knowledge’ arose as accounting for almost 81% of the variance within the Impairment and Body Function component. A single factor was identified as accounting for almost 60% of the variance in the Personal Reactions/Factors component. Further, the two factors ‘family’ and ‘social and school’ were identified as responsible for almost 82% of the variance in the Environmental Factor component. Finally, one factor was identified as representing almost 78% of the variance in the Quality of Life component.

Two consistent key findings emerged from these exploratory factor analyses. Firstly, in children and adolescents, the questionnaire and assessment data mapped very strongly onto the Yaruss and Quesal (2004) model and in doing so demonstrated great integrity of this holistic viewpoint. Secondly, the differences between the two age groups showed the impact of the time trajectory of this complex speech disorder particularly for the Personal and Environmental components. The specific factors of ‘anxiety’ and ‘social and school’ emerged as unique and with the greatest impact for adolescents. Collectively, the detailed assessment of children and adolescents using the Yaruss and Quesal (2004) model as a framework provides a more detailed explanation of the complexities and diverse impacts of stuttering on the young developing person.

These findings reinforce the premise that this biopsychosocial model assists in documenting the intricate experiences of the children and adolescents who stutter, and through the documentation of their negative experiences clinicians can more comprehensively focus the necessary treatment protocols to counteract the negative impact of stuttering on their lives.

#### **5.4.12 Clinical Management of Children and Adolescents who Stutter**

The outstanding and unexpected feature of these findings is the stability of the results over a long period of time. In these children and adolescents who stutter, the fears, anxieties and distress they are experiencing, stays with them unwaveringly. Other researchers have reported the difficulties of measurement in the school age population (Koushik et al., 2009; Lincoln et al., 1996), arguing the unpredictability of the young peoples' reactions. In short, the collective results from Chapters 3 and 5 consistently and reliably demonstrated that these children and adolescents who stutter for whom early speech pathology treatment was deemed unsuccessful, were found to have significantly greater levels of state anxiety, trait anxiety, social anxiety, behavioural and social difficulties, self-awareness of their speaking ability, reactions to their speaking ability, communication difficulties and poorer quality of life than their fluent peers.

As mentioned previously, and further supported by this study, speech pathologists who are charged with the responsibility of managing the stuttering disorder in children and adolescents need to obtain important clinical information regarding prognostic indicators, familial inheritance, precise treatment history and psychosocial issues. The finding that children and adolescents who stutter have higher levels of state, trait and social anxiety; higher behavioural, social and communication difficulties; and poorer quality of life is significant for practicing clinicians. As demonstrated in this study, these elevated levels of psychosocial functioning appear to remain elevated for a

significant amount of time (at least 2 months) and appear to have a dramatic impact on the child or adolescents quality of life. These collective results suggest a place for more integrated psychosocial treatments in the management of children and adolescents who stutter. These integrated psychological therapies may include reducing the child's negative reactions to stuttering through desensitisation and acceptance and commitment therapy; reducing the negative impact of the child's environment through desensitisation and situational hierarchies; and reducing activity limitations and participation restrictions through strategies which support generalisation and communicating effectively in all situations. Although the specific content and success of such treatments are yet to be identified, the findings from this current study suggest that a biopsychosocial approach to intervention is encouraged in children and adolescents who stutter.

This results here also highlight the need to consider children and adolescents who stutter as a separate and unique cohort not to be conjoined with preschool children or adult treatments. It has been demonstrated that these school age children and adolescents present with different priorities for therapy. It is recommended that a flexible and biopsychosocial view to treatment choices be adopted in the management of school age children and adolescents who stutter, as it is clear that these clients intrinsically differ in their symptoms and reactions to their stuttering experience.

#### **5.4.13 Limitations and Future Directions**

As mentioned previously, there are several specific limitations in the various studies presented in this thesis which restrict the conclusions that can be drawn. The various limitations and resulting future research directions are evaluated and discussed below.

#### 5.4.13.1 Self-Report Data Collection

Consistent with the studies detailed in Chapters 3 and 4, this study also relied on self-report measures to assess the various psychosocial variables under investigation. This form of quantitative measurement presents a number of issues, including the operation of response bias and shared variance between the measures. However, in reality, self-report methods are currently one of few available methodologies for the collection of subjective data and questionnaire procedures are widely accepted as valid and reliable (Turk & Melzack, 1992).

As mentioned previously, future research studies should obtain data from alternate sources such as qualitative research methods or information obtained from significant others to verify and cross-validate the self-report responses of children and adolescents who stutter.

#### 5.4.13.2 Cross-sectional Analysis

This study, and the study detailed in Chapter 3 are both cross-sectional in nature, although the children and adolescents who stutter were measured at two separate time-points. As a result of their cross-sectional nature, causal attributions cannot be made about the nature of the relationships between stuttering severity and these psychosocial variables. Longitudinal studies of children and adolescents who stutter are essential to gain a better understanding of those factors that are prognostic in long-term adjustment to the stuttering disorder itself and to the impact of stuttering on other biopsychosocial areas of the child or adolescent's life.

#### 5.4.13.3 Children and Adolescent Cohorts

The sample of children and adolescents who were used in this cross-sectional study were a distinctive sub-set of young people who stutter, given that they were drawn

from the Wait-List for a biopsychosocial Fluency & Confidence group treatment program specifically run by the Curtin University Stuttering Treatment Clinic. Therefore these findings cannot be generalised to all children and adolescents who stutter living in the community. However, these children and adolescents who stutter may be considered indicative of children and adolescents who stutter presenting for treatment that had previously been provided with speech pathology therapy treatments which have been reported by either the clinician or parents not to have achieved significant improvement or success.

It is important that future research studies with larger heterogeneous sample cohorts of children and adolescents who stutter replicate the assessment and treatment studies documented in this thesis. Replication of this study would enable investigation of the strength and universality of the relationships documented in this thesis. It is hoped that future studies will investigate and provide empirical support for a biopsychosocial approach to the assessment and treatment of children and adolescents who stutter.

#### 5.4.13.4 Replication of Findings

The findings presented in this study and the results presented in Chapter 3 offer some important insights into relationships which may become targets for more effective treatment programs for children and adolescents who stutter. The novel findings of this study necessitates that other researchers and further studies need to replicate these findings in a larger number of children and adolescents who stutter. These studies should ideally be prospective in nature and include the various psychosocial measures which have been detailed in this thesis.

#### 5.4.13.5 Biopsychosocial Theories, Models and Supportive Data

In Chapter 3 and 4, cross-sectional studies were used to provide a new biopsychosocial approach for the assessment of children and adolescents who stutter. The body of research described in this study used quantitative research methods to further explore the impact of the stuttering disorder on anxiety and inherent psychosocial variables in children and adolescents who stutter using a biopsychosocial framework. The findings from this study and the studies detailed in Chapters 3 and 4 were then used to expand the knowledge base of biopsychosocial effectiveness based treatments for children and adolescents who stutter.

As mentioned previously, there are limited published research studies which use this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). To date, the incorporation of a psychosocial perspective to the assessment and treatment of stuttering in children and adolescents has only been documented in a limited number of previous research studies (Craig et al., 1996; Hancock et al., 1998; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). Therefore, biopsychosocial theories, models and research which investigate the impact and consequences of the stuttering disorder in childhood and adolescents are urgently needed. These biopsychosocial theories, models and research will assist in the development of more comprehensive assessments and treatments for children and adolescents who stutter.

## 5.5 Chapter Summary

In summary, children and adolescents who stutter for whom early speech pathology treatment was deemed unsuccessful, were found to have consistently high state anxiety, trait anxiety, social anxiety; behavioural and social difficulties; self-

awareness of their stuttering, reactions to their stuttering, communication difficulties in daily situations and poorer quality of life compared to the same children and adolescents who stutter who were assessed 8 week prior. These psychosocial variables were all assessed as above clinically normal limits.

These results are both theoretically and clinically significant and advocate the need for a biopsychosocial perspective when managing children and adolescents who stutter. In addition, these results, and those results documented in Chapter 3, support the proposal that the stuttering disorder in children and adolescents who stutter may impact significantly on the anxiety levels and psychosocial functioning given the various relationships detailed between the severity of stuttering and these psychosocial variables.



## **6.0 CHAPTER 6: EFFECTIVENESS OF THE FLUENCY & CONFIDENCE AND INVESTING IN PARENTS GROUP PROGRAMS**

In the previous Chapters, the relationship between several psychosocial variables and stuttering severity in children and adolescents who stutter were investigated at two separate time-point (Wait-List and Pre-Group) separated by 8 weeks. The participants selected for exploration of this relationship were children and adolescents who stuttered (8 – 17 years of age), who were referred to the Curtin University Stuttering Treatment Clinic by community based speech pathologists and parents for an alternative biopsychosocial approach to the treatment of their stuttering disorder.

Between the Wait-List and Pre-Group phases, 15 of the 36 adolescents declined the invitation to participate in the biopsychosocial group treatment program. In Chapter 4, using a mixed methods design incorporating qualitative semi-structured interviews and quantitative questionnaires, barriers which precluded adolescents from attending therapy were explored. Fifteen adolescents who chose not to participate in the group treatment program were interviewed and their qualitative data was analysed using a phenomenological approach. The quantitative data was obtained from all 36 adolescents who completed 5 quantitative questionnaires 8 weeks prior to the commencement of the group therapy program. The implications and future clinical directives addressing commitment and participation in a holistic biopsychosocial group treatment programs were presented and discussed.

The aim of this Chapter 6 study was to determine the effectiveness of two group programs: i) A holistic biopsychosocial group program for the treatment of stuttering in children and adolescents who stutter entitled Fluency & Confidence; and ii) A concurrently run support group for parents entitled Investing in Parents.

## **6.1 STUDY AIM AND HYPOTHESES**

The study describes in detail three areas of investigation: i) The statistical and clinical effectiveness of the Fluency & Confidence group treatment program on stuttering speech severity and aspects of psychosocial functioning in children and adolescents who stutter; ii) The statistical and clinical effectiveness of the concurrently run Investing in Parent group treatment program on parent perceptions of the psychosocial functioning of their children; and iii) The statistical and clinical differences between the responses of children who stutter, adolescents who stutter and their parents on two psychosocial questionnaires at four time-points of Pre-Group, Mid-Group, Post-Group and Follow-Up.

Firstly, both children and adolescents who stutter were hypothesised to demonstrate a reduction in stuttering severity and a reduction in their previously documented clinical levels of psychosocial functioning at Mid-Group, Post-Group and Follow-Up.

Secondly, parent participation in the treatment program was hypothesised to demonstrate a significant reduction in the parent's perceptions of the previously demonstrated clinical levels of psychosocial functioning of their children.

Finally, Chapter 6 aims to examine differences between the perceptions of parents and their children concerning the impact of stuttering on the biopsychosocial variables measured at the four time-points (Pre-Group, Mid-Group, Post-Group and Follow-Up).

## **6.2 METHODS**

### **6.2.1 Participants**

#### **6.2.1.1 Children and Adolescents Who Stutter**

All 39 children (8 -11 years) and 21 adolescents (12-15 years) who commenced the Fluency & Confidence group program, completed the entire program and were

assessed at the beginning (Pre-Group, T1), at the end of Week 4 (Mid-Group, T2), at the end of the program (Post-Group, T3) and 8 weeks after the program had been completed (Follow-Up, T4).

#### 6.2.1.2 Parents and Caregivers of Children and Adolescents Who Stutter

All 60 Caregivers who participated in the concurrently run Investing in Parents group program were also assessed at the beginning of the program (Pre-Group, T1), at the end of Week 4 (Mid-Group, T2), at the end of the program (Post-Group, T3) and 8 weeks after the program was completed (Follow-Up, T4).

### 6.2.2 Measures

#### 6.2.2.1 Stuttered Speech Severity

The stuttered severity speech measures were obtained at each of the four time-points (Pre-Group, Mid-Group, Post-Group, and Follow-Up) by clinical ratings of representative natural conversational speech samples of the 39 children and 21 adolescents within this study. These representative natural conversational speech samples were obtained during their clinical visits to the CUSTC and each participant provided fully authorised and informed consent for the collection and assessment of their speech samples. A minimum standard of 2000 syllables of speech was obtained and rated by two qualified and experienced speech pathologists from the CUSTC. The computer program Stuttering Measurement System (Ingham et al., 2005) was used to obtain and calculate the measures of percentage of syllables stuttered (%SS).

#### 6.2.2.2 Children and Adolescents Who Stutter

Each CWS and AWS who completed the original set of questionnaires at Pre-Group (Chapter 5), were asked to complete the same questionnaires at the Mid-Group,

Post-Group and Follow-Up time-points. The detailed information regarding the original assessment questionnaires is provided in Chapter 3.

#### 6.2.2.3 Parents of Children and Adolescents Who Stutter:

The Caregiver for each CWS and AWS who completed the Pre-Group questionnaires was asked to complete the questionnaires at end of Mid-Group, Post-Group and at Follow-Up time-points for consistency. The questionnaires are detailed below:

##### *Strengths and Difficulties Questionnaire (SDQ-Parent version)*

A single caregiver of the CWS or AWS was asked to complete a Strengths and Difficulties Questionnaire (SDQ-Parent version; Goodman & Scott, 1999). As detailed previously, the SDQ is a 25 item questionnaire designed to obtain a screening assessment of a child's (aged from 4 to 17 years) internalising and externalising behaviours as well as social adjustment. The SDQ has been found to reliably identify high from low risk children within the community (Goodman & Scott, 1999). Six versions currently exist for parents, teachers and child to report on a child's behaviour. In this study, parents of the CWS and AWS completed either the Parent<sup>4-10</sup> version for CWS aged between 4 and 10, or the Parent<sup>11-17</sup> version for CWS aged between 11 and 17. The cut off scores in which distinctions are drawn between normal, borderline and abnormal adjustment, vary across the parent (SDQ-Parent) and self-reported (SDQ-Self) versions (Mellor, 2004). A higher total difficulties score reflects greater difficulties with adjustment.

As mentioned previously, the test-retest reliability and long term stability of the different versions of the SDQ is well documented in the literature. The test-retest reliability coefficients (measuring total difficulties) of the parent version have been reported as .81 and the youth version, as .79. The long term stability of the parent and

youth versions have been reported as .72 and .62 respectively (Achenbach et al., 2008). Participants were asked to read each statement and indicate their response on a scale of Not True, Somewhat True or Certainly True. The SDQ was completed in approximately 10 minutes.

#### *Overall Assessment of the Speaker's Experience of Stuttering (Parent version)*

The Overall Assessment of the Speaker's Experience of Stuttering questionnaire (Parent version) (OASES-P: Appendix D, Yaruss & Quesal, 2006) consists of 100 items, each scored on a Likert scale ranging from 1 to 5. The questionnaire is divided into 4 sections (Section I: General information about Stuttering; Section II: Affective, Behavioural and Cognitive Reactions, Section III: Communication in Daily Situations, and Section IV: Impact of Stuttering on Quality of Life). Section I (General information) contains 20 items pertaining to parents perceptions' of their child's fluency and speech naturalness, knowledge about stuttering and stuttering therapy, and overall perceptions about stuttering in general. Section II (Reactions to stuttering) contains 30 items examining parents perceptions' of their child's affective, behavioural, and cognitive reactions. Section III (Communication in daily situations) contains 25 items assessing parent perceptions' of their child's degree of difficulty in communication in general. Note that these items specifically examine the communication *difficulty* speakers' experience in these situations, not their *fluency* in the situations. Section IV (Quality of life) contains 25 items about parents perceptions' of how much stuttering interferes with their child's satisfaction with their ability to communicate, their relationships, their ability to participate in their lives, and their overall sense of well-being. The OASES (parent version) was completed in approximately 20 minutes.

The parent version differs from the adult version in terms of alternative wording on specified items. The adult version has demonstrated strong reliability and validity,

with Pearson product moment correlation coefficients for impact scores reported to range from .90 to .97 (Yaruss & Quesal, 2006). Concurrent validity correlation coefficients are reported to range from .68 to .83 (Yaruss & Quesal, 2006). No reliability or validity data are currently available for the parent version.

In this parent version (OASES-P; Appendix D), the word *your speech* or *you* was replaced with *your child's speech* or *your child*. This questionnaire version was presented to the parents of the CWS and AWS whilst the OASES-C & A questionnaire version (Appendix A) was presented to the CWS and AWS. Raw scores were converted to impact scores using the procedure outlined by Yaruss and Quesal (2006) and these impact scores were used in data analyses to account for participants who may not have responded to all questions.

For each item on the OASES, response scales were organised so that higher scores indicated a greater degree of negative impact associated with stuttering and lower scores indicated less negative impact.

### **6.2.3 Procedure**

At the end of each time point specified above, the CWS, AWS and Parents of CWS and AWS were given the questionnaire booklets and asked to complete and return them in a replied paid envelope within 1 week. The order of presentation of questionnaires within the booklet was counterbalanced to control for order effects.

### **6.2.4 Design and Statistical Analysis**

One-way repeated measures ANOVAs and MANOVAs were used to test the differences between treatment time-points (Pre-Group, Mid-Group, Post-Group and Follow-Up) on outcome measures.

Statistical hypothesis testing was supplemented by calculations of both effect size and clinically significant change indicators. The effect size of the Fluency & Confidence group program at Pre-Group, Mid-Group, Post-Group and Follow-Up on outcome measures was determined using Cohen's  $d$  (Cohen, 1988). The clinically statistical significance of individual change in outcomes was assessed using the Jacobson and Truax methodology (1991). Clinically significant change occurs when the status of a client's measured functioning falls in the non-functional range at the beginning of treatment and in the functional ranges post treatment, provided that the change is statistically reliable (Jacobson & Truax, 1991). There are two steps to determining clinically significant change: (1) the establishment of cut-off points for assessing clinically significant change; and (2) determining the reliability of that change. Jacobson's methodology (Jacobson, Follette, & Revenstorf, 1986) and subsequent revision (Jacobson & Truax, 1991) proposed three cut-off criteria. Cutoff  $a$  refers to the point at which values fall outside the range of the dysfunctional population, operationalised as two standard deviations from the pre-treatment mean in the direction of functionality. Cutoff  $b$  is the point at which values fall within the range of the functional or normal population, operationalised as within two standard deviations from the mean of the functional population. Cutoff  $b$  can only be calculated if non-patient data are available. Cutoff  $c$  is the midpoint between the mean of the functional population and the mean of the dysfunctional population. Scores which fall closer to the functional population mean are deemed clinically significant. When normative data exists for both functional and non-functional populations, Cutoff  $c$  is the preferred method of choice. Cutoff  $a$  is applied when normative data are unavailable for the functional population, and Cutoff  $b$  when normative data are not available for the dysfunctional population. For change to be clinically significant it must be reliable beyond measurement error. Reliability is determined by calculating the Reliable

Change Index (Jacobson et al., 1986). If the value of Reliable Change Index occurs outside the range  $\pm 1.96$  it is unlikely that the change is due to random measurement error, therefore the change is deemed reliable ( $p < .05$ ). Jacobson and Truax (1991) suggested a classification system based on Reliable Change Index and outcome scores. If the client's post treatment scores fall in the functional range, and the Reliable Change Index is larger than 1.96, the client is classified as *recovered*. If the Reliable Change Index is above 1.96, but the client's post treatment score does not fall in the functional range, the client is classified as *improved*. If neither criterion is met, the client is classified as *unchanged*. If the Reliable Change Index is greater than 1.96, and the client's post treatment score has moved in the direction of dysfunction, the client is classified as *deteriorated*.

## **6.3 RESULTS:**

### **6.3.1 Preliminary Analysis**

#### *Data Screening*

Univariate descriptive statistics were generated to assess the accuracy of data input (Tabachnick & Fidell, 2007). Data was screened for missing values using SPSS Missing Values Analysis. No data was missing.

#### *Assumption Testing*

Assumptions underlying analyses were tested prior to data analysis. The ANOVA and MANOVA assumptions include normality, homogeneity of regression slopes, homogeneity of variance, and linearity (Coakes & Steed, 1999).

#### *Normality, homogeneity of regression slopes, and homogeneity of variance*

Normality of variables and standardised residuals were tested at each treatment level through examination of box-plots and normality statistics such as skewness, kurtosis and the Shapiro-Wilks test. Shapiro-Wilks test indicated non-normal



distributions for some variables and standardised residuals ( $p < .05$ ). Values of univariate skew greater than  $\pm 3$  and univariate kurtosis greater than  $\pm 10$  are considered problematic (Keppel, 1991). There were no values outside these parameters. Cases with standardised  $z$  scores greater than 3.29  $SDs$  from the mean for that variable ( $p < .001$ , two-tailed test) are considered univariate outliers. No univariate outliers were detected. In the ANOVA and MANOVA, dependent variables (DV) and covariates were screened for outliers at each level of the independent variables (IV). Standardised residuals with absolute values greater than 3 are considered problematic. This assumption was met. Cooks distance (values greater than 1), Mahalanobis distance (values with  $p < .001$ ) and leverage (values greater than .5) were used to detect multivariate outliers. No suspect cases were observed.

Homogeneity of regression slopes was investigated via a multivariate analysis of variance (MANOVA) procedure (Tabachnick & Fidell, 2007). The assumption was satisfied for all variables. Homogeneity of variance of the DVs and the covariates was tested. There were no violations of assumption observed.

Although in some instances data departed slightly from normality, homogeneity of regression slopes, and homogeneity of variance, the  $F$  test is robust to these departures when group sizes are equal (Hamilton 1977; Levy, 1980; Olejnik & James, 1984; Shields, 1978). Hence, the decision was made to leave data intact and avoid applying a corrective strategy as this would have compromised power and the relevance of interpretations drawn.

### *Linearity*

Linearity between DVs and covariates was inspected via scatterplots. This assumption was violated for some variables. Violation produces a loss of power to the ANOVA test, and can lead to the biasing of results in a conservative direction. No corrections, such as transformation, were undertaken, as it was considered more

important to preserve the constructs. This decision was also based on the consideration that violation does not inflate the Type I error rate, a potentially serious circumstance, but instead produces more conservative results.

#### *Sphericity*

The sphericity assumption proposes that the covariances and variances are equal in the population. This assumption was automatically satisfied as mixed ANOVAs contained only two levels of the within-subjects factor.

#### *Homogeneity of Intercorrelations.*

The pattern of intercorrelations among the levels of the within-subjects factor should be equivalent across levels of the between-subjects factor in mixed ANOVAs. This assumption was tested using Box's *M* statistic. Heterogeneity is indicated when the statistic is significant at an alpha level of .001. This assumption was satisfied.

### **6.3.2 Descriptive Data Analysis**

Descriptive statistics were computed for the %SS, STAI (State and Trait), STAIC (State and Trait), BFNE-II, SDQ, OASES (Sections I, II, III & IV), SOC (precontemplation, contemplation, action & maintenance), and Age, and are shown in Tables 6.1, 6.2, 6.3 and 6.4.

A repeated measures ANOVA was conducted to compare the speech assessments and measures at Time 1 (Pre-Group), Time 2 (Mid-Group), Time 3 (Post-Group) and Time 4 (Follow-Up) in order to investigate the effectiveness of the Fluency & Confidence group program in children and adolescents; and the effectiveness of the Investing in Parents group program.

Table 6.1: Descriptive Statistics for Outcome Measures of CWS at Pre-Group, Mid-Group, Post-Group, and Follow-Up ( $N = 39$ )

Measures	T1		T2		T3		T4		<i>p</i> value	<i>partial</i> $\eta^2$
	M	SD	M	SD	M	SD	M	SD		
<i>Impairment</i>										
% SS	4.47	2.46	2.81	1.42	1.47	0.74	1.70	0.72	<.001	.68
OASES-SI	57.82	8.28	40.82	3.95	28.87	2.70	30.10	2.78	<.001	.93
<i>Personal</i>										
STAIC (state)	47.18	3.86	38.95	2.69	31.64	0.63	32.10	1.55	<.001	.81
STAIC (trait)	47.28	5.79	39.05	2.45	31.62	1.02	31.79	1.40	<.001	.85
BFNE - II	43.39	5.02	29.59	4.25	17.46	3.10	18.03	2.92	<.001	.94
OASES-SII	59.93	9.99	39.61	4.40	29.78	1.94	31.23	2.34	<.001	.90
<i>Environmental</i>										
SDQ	13.85	2.56	8.23	1.53	4.41	1.52	4.74	1.39	<.001	.91
OASES-SIII	64.10	11.17	43.14	5.66	32.02	2.60	33.48	2.93	<.001	.89
<i>Quality of Life</i>										
OASES-SIV	56.94	11.21	39.12	3.86	29.25	1.76	30.81	2.59	<.001	.85
AGE	9.82	1.05	9.92	1.01	9.95	1.05	10.13	1.13	<.001	.21

### 6.3.3 Between Group Comparisons: Repeated Measures ANOVA

#### 6.3.3.1 Children

##### *Impairment in Body Function*

The repeated measures ANOVA indicated that the severity of stuttering (%SS) was reduced significantly over time,  $F(3, 114) = 80.67$ ,  $p < .001$ , partial  $\eta^2 = .68$ .

A series of pairwise comparisons revealed that pre-group severity of stuttering ( $M = 4.47$ ,  $SD = 2.46$ ) was reduced significantly at the mid-group time-point ( $M = 2.81$ ,  $SD = 1.42$ ), post-group time point ( $M = 1.47$ ,  $SD = .74$ ) and follow-up time-point ( $M = 1.70$ ,  $SD = .72$ ).

The self-awareness and knowledge of stuttering (OASES-SI) impact ratings improved significantly over time,  $F(3, 114) = 465.54$ ,  $p < .001$ , partial  $\eta^2 = .93$ . Pairwise comparisons revealed that the pre-group OASES-SI ( $M = 57.82$ ,  $SD = 8.28$ ) was decreased significantly at mid-group ( $M = 40.82$ ,  $SD = 3.95$ ), post-group ( $M = 28.87$ ,  $SD = 2.70$ ) and follow-up ( $M = 30.10$ ,  $SD = 2.78$ ).

##### *Personal Factors / Reactions*

The state anxiety scores improved significantly over time,  $F(3, 114) = 161.51$ ,  $p < .001$ , partial  $\eta^2 = .81$ ; and the trait anxiety scores improved significantly over time,  $F(3, 114) = 215.87$ ,  $p < .001$ , partial  $\eta^2 = .85$ . Pairwise comparisons revealed that the pre-group state anxiety scores ( $M = 47.18$ ,  $SD = 3.86$ ) were decreased significantly at the mid-group ( $M = 38.95$ ,  $SD = 2.69$ ), post-group ( $M = 31.64$ ,  $SD = 0.63$ ) and follow-up ( $M = 32.10$ ,  $SD = 1.55$ ). In addition, pairwise comparisons revealed that the pre-group trait anxiety scores ( $M = 47.28$ ,  $SD = 5.79$ ) were decreased significantly at mid-group ( $M = 39.05$ ,  $SD = 2.45$ ), post-group ( $M = 31.62$ ,  $SD = 1.02$ ) and follow-up ( $M = 31.79$ ,  $SD = 1.40$ ).

The fear of negative evaluation (BFNE-II) scores improved significantly over time,  $F(3, 114) = 598.79$ ,  $p < .001$ , partial  $\eta^2 = .94$ . Pairwise comparisons revealed that

the average pre-group BFNE-II scores ( $M = 43.39$ ,  $SD = 5.02$ ) were decreased significantly at mid-group ( $M = 29.59$ ,  $SD = 4.25$ ), post-group ( $M = 17.46$ ,  $SD = 3.10$ ) and follow-up ( $M = 18.03$ ,  $SD = 2.92$ ).

The reactions to stuttering (OASES-SII) impact ratings improved significantly over time,  $F(3, 114) = 329.49$ ,  $p < .001$ , partial  $\eta^2 = .90$ . Pairwise comparisons revealed that the pre-group OASES-SII ( $M = 59.93$ ,  $SD = 9.99$ ) was decreased significantly at mid-group ( $M = 39.61$ ,  $SD = 4.40$ ), post-group ( $M = 29.78$ ,  $SD = 1.94$ ) and follow-up ( $M = 31.23$ ,  $SD = 2.34$ ).

#### *Environmental Factors*

The behavioural and social difficulties (SDQ) scores improved significantly over time,  $F(3, 114) = 367.55$ ,  $p < .001$ , partial  $\eta^2 = .91$ . Pairwise comparisons revealed that the pre-group SDQ scores ( $M = 13.85$ ,  $SD = 2.56$ ) were decreased significantly at mid-group ( $M = 8.23$ ,  $SD = 1.53$ ), post-group ( $M = 4.41$ ,  $SD = 1.52$ ) and follow-up ( $M = 4.74$ ,  $SD = 1.39$ ).

The communication difficulties in daily situations (OASES-SIII) impact ratings improved significantly over time,  $F(3, 114) = 309.18$ ,  $p < .001$ , partial  $\eta^2 = .89$ . Pairwise comparisons revealed that the average pre-group OASES-SIII ( $M = 64.10$ ,  $SD = 11.17$ ) was decreased significantly at mid-group ( $M = 43.14$ ,  $SD = 5.66$ ), post-group ( $M = 32.02$ ,  $SD = 2.60$ ) and follow-up ( $M = 33.48$ ,  $SD = 2.93$ ).

#### *Quality of Life*

The quality of life (OASES-SIV) impact ratings improved significantly over time,  $F(3, 114) = 210.42$ ,  $p < .001$ , partial  $\eta^2 = .85$ . Pairwise comparisons revealed that the pre-group OASES-SIV ( $M = 56.94$ ,  $SD = 11.21$ ) was decreased significantly at mid-group ( $M = 39.12$ ,  $SD = 3.86$ ), post-group ( $M = 29.25$ ,  $SD = 1.76$ ) and follow-up ( $M = 30.81$ ,  $SD = 2.59$ ).

Table 6.2: Descriptive Statistics for Outcome Measures of AWS at Pre-Group, Mid-Group, Post-Group, and Follow-Up ( $N = 21$ )

Measures	T1		T2		T3		T4		<i>p</i> value	<i>partial</i> <i>η</i> <sup>2</sup>
	M	SD	M	SD	M	SD	M	SD		
<i>Impairment</i>										
% SS	5.31	3.69	3.05	1.84	1.64	0.91	2.19	1.04	<.001	.60
OASES-SI	61.43	10.01	39.95	4.60	28.90	2.36	30.48	2.87	<.001	.92
<i>Personal</i>										
STAI (state)	56.38	4.79	47.14	1.85	39.90	0.83	40.71	1.15	<.001	.89
STAI (trait)	57.24	3.14	46.43	3.03	40.76	0.44	41.24	0.89	<.001	.92
BFNE - II	47.62	5.53	32.05	6.18	19.33	4.66	20.29	4.39	<.001	.95
OASES-SII	61.97	10.84	40.60	4.92	30.57	2.04	31.87	1.86	<.001	.90
<i>Environmental</i>										
SDQ	14.48	1.75	8.81	1.60	4.00	1.52	4.95	1.07	<.001	.95
OASES-SIII	64.61	11.05	43.92	5.96	32.95	1.92	34.51	2.00	<.001	.90
<i>Quality of Life</i>										
OASES-SIV	56.19	12.66	39.50	5.85	29.75	2.64	30.93	1.76	<.001	.83
<i>Stage of Change</i>										
SOC (PRE)	21.90	5.41	28.14	3.75	17.00	1.34	16.43	0.68	<.001	.73
SOC (CONT)	31.76	6.53	35.00	1.14	38.90	1.37	37.48	0.75	<.001	.47
SOC (ACT)	27.62	4.94	32.24	2.05	39.05	1.20	38.14	0.65	<.001	.81
SOC (MAIN)	27.52	4.52	28.67	2.11	32.29	0.64	36.57	1.21	<.001	.73
AGE	12.62	0.80	12.76	1.00	12.76	1.00	12.86	1.01	.03	.16

### 6.3.3.2 Adolescents

#### *Impairment in Body Function*

The repeated measures ANOVA indicated that the severity of stuttering (%SS) reduced significantly over time,  $F(3, 60) = 29.33$ ,  $p < .001$ , partial  $\eta^2 = .60$ .

A series of pairwise comparisons revealed that the pre-group severity of stuttering ( $M = 5.31$ ,  $SD = 3.69$ ) was significantly reduced at mid-group ( $M = 3.05$ ,  $SD = 1.84$ ), post-group ( $M = 1.64$ ,  $SD = .91$ ) and follow-up ( $M = 2.19$ ,  $SD = 1.04$ ).

The self-awareness and knowledge of stuttering (OASES-SI) impact ratings improved significantly over time,  $F(3, 60) = 214.79$ ,  $p < .001$ , partial  $\eta^2 = .92$ . Pairwise comparisons revealed that the pre-group OASES-SI ( $M = 61.43$ ,  $SD = 10.01$ ) was decreased significantly at mid-group ( $M = 39.95$ ,  $SD = 4.60$ ), post-group ( $M = 28.90$ ,  $SD = 2.36$ ) and follow-up ( $M = 30.48$ ,  $SD = 2.87$ ).

#### *Personal Factors / Reactions*

The state anxiety scores improved significantly over time,  $F(3, 60) = 161.12$ ,  $p < .001$ , partial  $\eta^2 = .89$ ; and the trait anxiety scores improved significantly over time,  $F(3, 60) = 224.21$ ,  $p < .001$ , partial  $\eta^2 = .92$ . Pairwise comparisons revealed that the pre-group state anxiety scores ( $M = 56.38$ ,  $SD = 4.79$ ) were decreased significantly at mid-group ( $M = 47.14$ ,  $SD = 1.85$ ), post-group ( $M = 39.90$ ,  $SD = .83$ ) and follow-up ( $M = 40.71$ ,  $SD = 1.15$ ). Pairwise comparisons revealed that the pre-group trait anxiety scores ( $M = 57.24$ ,  $SD = 3.14$ ) were decreased significantly at mid-group ( $M = 46.43$ ,  $SD = 3.03$ ), post-group ( $M = 40.76$ ,  $SD = .44$ ) and follow-up ( $M = 41.24$ ,  $SD = .89$ ).

The fear of negative evaluation (BFNE-II) scores improved significantly over time,  $F(3, 60) = 369.68$ ,  $p < .001$ , partial  $\eta^2 = .95$ . Pairwise comparisons revealed that the pre-group BFNE-II scores ( $M = 47.62$ ,  $SD = 5.53$ ) were decreased significantly at mid-group ( $M = 32.05$ ,  $SD = 6.18$ ), post-group ( $M = 19.33$ ,  $SD = 4.66$ ) and follow-up ( $M = 20.29$ ,  $SD = 4.39$ ).

The reactions to stuttering (OASES-SII) impact ratings improved significantly over time,  $F(3, 60) = 187.59$ ,  $p < .001$ , partial  $\eta^2 = .90$ . Pairwise comparisons revealed that the pre-group OASES-SII ( $M = 61.97$ ,  $SD = 10.84$ ) was decreased significantly at mid-group ( $M = 40.60$ ,  $SD = 4.92$ ), post-group ( $M = 30.57$ ,  $SD = 2.04$ ) and follow-up ( $M = 31.87$ ,  $SD = 1.86$ ).

#### *Environmental Factors*

The behavioural and social difficulties (SDQ) scores improved significantly over time,  $F(3, 60) = 341.48$ ,  $p < .001$ , partial  $\eta^2 = .95$ . Pairwise comparisons revealed that the pre-group SDQ scores ( $M = 14.48$ ,  $SD = 1.75$ ) were decreased significantly at mid-group ( $M = 8.81$ ,  $SD = 1.60$ ), post-group ( $M = 4.00$ ,  $SD = 1.52$ ) and follow-up ( $M = 4.95$ ,  $SD = 1.07$ ).

The communication difficulties in daily situations (OASES-SIII) impact ratings improved significantly over time,  $F(3, 60) = 179.55$ ,  $p < .001$ , partial  $\eta^2 = .90$ . Pairwise comparisons revealed that the pre-group OASES-SIII ( $M = 64.61$ ,  $SD = 11.05$ ) was decreased significantly at mid-group ( $M = 43.92$ ,  $SD = 5.96$ ), post-group ( $M = 32.95$ ,  $SD = 1.92$ ) and follow-up ( $M = 34.51$ ,  $SD = 2.00$ ).

#### *Quality of Life*

The quality of life (OASES-SIV) impact ratings improved significantly over time,  $F(3, 60) = 99.94$ ,  $p < .001$ , partial  $\eta^2 = .83$ . Pairwise comparisons revealed that the pre-group OASES-SIV ( $M = 56.19$ ,  $SD = 12.66$ ) was decreased significantly at mid-group ( $M = 39.50$ ,  $SD = 5.85$ ), post-group ( $M = 29.75$ ,  $SD = 2.64$ ) and follow-up ( $M = 30.93$ ,  $SD = 1.76$ ).



Table 6.3: Descriptive Statistics for Outcome Measures of Parents of CWS at Pre-Group, Mid-Group, Post-Group, and Follow-Up ( $N = 39$ )

Measures	T1		T2		T3		T4		<i>p</i> value	<i>partial</i> $\eta^2$
	M	SD	M	SD	M	SD	M	SD		
<i>Impairment</i>										
OASES-SI	67.20	7.43	42.62	3.45	29.60	2.52	31.39	2.78	<.001	.96
<i>Personal</i>										
OASES-SII	68.27	10.53	42.26	4.30	30.34	1.98	32.33	2.36	<.001	.92
<i>Environmental</i>										
SDQ	17.18	2.69	9.18	1.39	4.18	1.41	5.46	1.29	<.001	.94
OASES-SIII	72.45	10.05	45.05	5.83	32.78	2.39	35.02	1.92	<.001	.93
<i>Quality of Life</i>										
OASES-SIV	66.09	11.11	42.28	3.73	30.13	1.72	31.92	1.83	<.001	.91

### 6.3.3.3 Parents of CWS

#### *Impairment in Body Function*

The repeated measures ANOVA indicated that the parent's perception of child's self-awareness and knowledge of stuttering (OASES-SI) improved significantly over time,  $F(3, 114) = 1013.75$ ,  $p < .001$ , partial  $\eta^2 = .96$ . A series of pairwise comparisons revealed that the pre-group OASES-SI ( $M = 67.20$ ,  $SD = 7.43$ ) was decreased significantly at mid-group ( $M = 42.62$ ,  $SD = 3.45$ ), post-group ( $M = 29.60$ ,  $SD = 2.52$ ) and follow-up ( $M = 31.39$ ,  $SD = 2.78$ ).

#### *Personal Factors / Reactions*

The parent's perception of child's reactions to stuttering (OASES-SII) improved significantly over time,  $F(3, 114) = 460.93$ ,  $p < .001$ , partial  $\eta^2 = .92$ . Pairwise comparisons revealed that the average pre-group OASES-SII ( $M = 68.27$ ,  $SD = 10.53$ ) was decreased significantly at mid-group ( $M = 42.26$ ,  $SD = 4.30$ ), post-group ( $M = 30.34$ ,  $SD = 1.98$ ) and follow-up ( $M = 32.33$ ,  $SD = 2.36$ ).

#### *Environmental Factors*

The parent's perception of child's behavioural and social difficulties (SDQ) scores improved significantly over time,  $F(3, 114) = 542.73$ ,  $p < .001$ , partial  $\eta^2 = .94$ . Pairwise comparisons revealed that the pre-group SDQ scores ( $M = 17.18$ ,  $SD = 2.69$ ) were decreased significantly at mid-group ( $M = 9.18$ ,  $SD = 1.39$ ), post-group ( $M = 4.18$ ,  $SD = 1.41$ ) and follow-up ( $M = 5.46$ ,  $SD = 1.29$ ).

The parent's perception of child's communication difficulties in daily situations (OASES-SIII) improved significantly over time,  $F(3, 114) = 540.62$ ,  $p < .001$ , partial  $\eta^2 = .93$ . Pairwise comparisons revealed that the pre-group OASES-SIII ( $M = 72.45$ ,  $SD = 10.05$ ) was decreased significantly at mid-group ( $M = 45.05$ ,  $SD = 5.83$ ), post-group ( $M = 32.78$ ,  $SD = 2.39$ ) and follow-up ( $M = 35.02$ ,  $SD = 1.92$ ).

### *Quality of Life*

The parent's perception of child's quality of life (OASES-SIV) improved significantly over time,  $F(3, 114) = 386.90$ ,  $p < .001$ , partial  $\eta^2 = .91$ . Pairwise comparisons revealed that the pre-group OASES-SIV ( $M = 66.09$ ,  $SD = 11.11$ ) was decreased significantly at mid-group ( $M = 42.28$ ,  $SD = 3.73$ ), post-group ( $M = 30.13$ ,  $SD = 1.72$ ) and follow-up ( $M = 31.92$ ,  $SD = 1.83$ ).

#### 6.3.3.4 Parents of AWS

### *Impairment in Body Function*

The repeated measures ANOVA indicated that the parent's perception of adolescent's self-awareness and knowledge of stuttering (OASES-SI) improved significantly over time,  $F(3, 60) = 220.47$ ,  $p < .001$ , partial  $\eta^2 = .92$ . Pairwise comparisons revealed that the pre-group OASES-SI ( $M = 66.85$ ,  $SD = 10.86$ ) was decreased significantly at mid-group ( $M = 42.77$ ,  $SD = 3.06$ ), post-group ( $M = 29.43$ ,  $SD = 2.46$ ) and follow-up ( $M = 31.95$ ,  $SD = 2.44$ ).

### *Personal Factors / Reactions*

The parent's perception of adolescent's reactions to stuttering (OASES-SII) improved significantly over time,  $F(3, 60) = 298.01$ ,  $p < .001$ , partial  $\eta^2 = .94$ . Pairwise comparisons revealed that the pre-group OASES-SII ( $M = 68.19$ ,  $SD = 9.11$ ) was decreased significantly at mid-group ( $M = 43.56$ ,  $SD = 3.75$ ), post-group ( $M = 31.05$ ,  $SD = 2.08$ ) and follow-up ( $M = 33.30$ ,  $SD = 1.96$ ).

### *Environmental Factors*

The parent's perception of adolescent's behavioural and social difficulties (SDQ) scores improved significantly over time,  $F(3, 60) = 587.54$ ,  $p < .001$ , partial  $\eta^2 = .97$ . Pairwise comparisons revealed that the pre-group SDQ scores ( $M = 17.19$ ,  $SD = 1.50$ ) were decreased significantly at mid-group ( $M = 8.86$ ,  $SD = 1.49$ ), post-group ( $M = 3.76$ ,  $SD = 1.18$ ) and follow-up ( $M = 5.67$ ,  $SD = 1.06$ ).

Table 6.4: Descriptive Statistics for Outcome Measures of Parents of AWS at Pre-Group, Mid-Group, Post-Group, and Follow-Up ( $N = 21$ )

Measures	T1		T2		T3		T4		<i>p</i> value	<i>partial</i> <i>η</i> <sup>2</sup>
	M	SD	M	SD	M	SD	M	SD		
<i>Impairment</i>										
OASES-SI	66.85	10.86	42.77	3.06	29.43	2.46	31.95	2.44	<.001	.92
<i>Personal</i>										
OASES-SII	68.19	9.11	43.56	3.75	31.05	2.08	33.30	1.96	<.001	.94
<i>Environmental</i>										
SDQ	17.19	1.50	8.86	1.49	3.76	1.18	5.67	1.06	<.001	.97
OASES-SIII	71.17	12.68	45.50	5.87	33.33	1.98	35.92	1.82	<.001	.89
<i>Quality of Life</i>										
OASES-SIV	65.49	9.76	43.24	3.87	30.25	2.62	32.38	1.55	<.001	.93

The parent's perception of adolescent's communication difficulties in daily situations (OASES-SIII) improved significantly over time,  $F(3, 60) = 165.53$ ,  $p < .001$ , partial  $\eta^2 = .89$ . Pairwise comparisons revealed that the pre-group OASES-SIII ( $M = 71.17$ ,  $SD = 12.68$ ) was decreased significantly at mid-group ( $M = 45.50$ ,  $SD = 5.87$ ), post-group ( $M = 33.33$ ,  $SD = 1.98$ ) and follow-up ( $M = 35.92$ ,  $SD = 1.82$ ).

#### *Quality of Life*

The parent's perception of adolescent's quality of life (OASES-SIV) improved significantly over time,  $F(3, 60) = 256.80$ ,  $p < .001$ , partial  $\eta^2 = .93$ . Pairwise comparisons revealed that the pre-group OASES-SIV ( $M = 65.49$ ,  $SD = 9.76$ ) was decreased significantly at mid-group ( $M = 43.24$ ,  $SD = 3.87$ ), post-group ( $M = 30.25$ ,  $SD = 2.62$ ) and follow-up ( $M = 32.38$ ,  $SD = 1.55$ ).

### **6.3.4 Effect Size**

#### **6.3.4.1 Children Who Stutter**

Effect sizes for each psychosocial variable measure in children are displayed in 6.5. According to Cohen's conventions (Cohen, 1988), large and significant treatment effects at Mid-Group, Post-Group and Follow-Up were observed for all measures.

#### **6.3.4.2 Adolescents Who Stutter**

Effect sizes for each psychosocial variable measure in children are displayed in 6.6. According to Cohen's conventions (Cohen, 1988), large and significant treatment effects at Mid-Group, Post-Group and Follow-Up were observed for all measures except Age.

Table 6.5: Effect Size of F & C Group Program in CWS at Mid-Group, Post-Group, and Follow-up on Measures ( $N = 39$ )

Measures	Change in Score		Effect Size	95% CI		<i>p</i>
	<i>M</i>	<i>SD</i>		lower	upper	value
% <i>SS</i>						
Mid-Group	-1.65	1.30	.83	-1.07	-2.23	<.001
Post-Group	-3.00	1.97	1.65	-2.12	-3.88	<.001
Follow-Up	-2.76	1.91	1.53	-1.91	-3.61	<.001
<i>OASES-SI</i>						
Mid-Group	-17.00	6.68	2.62	-14.02	-19.98	<.001
Post-Group	-28.95	7.34	4.70	-25.68	-32.22	<.001
Follow-Up	-27.72	7.49	4.49	-24.38	-31.06	<.001
<i>STAIC (state)</i>						
Mid-Group	-4.44	4.44	2.47	-2.46	-6.41	<.001
Post-Group	-11.74	5.00	5.62	-9.51	-13.97	<.001
Follow-Up	-11.28	5.33	5.13	-8.90	-13.66	<.001
<i>STAIC (trait)</i>						
Mid-Group	-8.23	4.88	1.85	-6.06	-10.40	<.001
Post-Group	-15.67	6.06	3.77	-12.96	-18.37	<.001
Follow-Up	-15.49	6.36	3.68	-12.65	-18.32	<.001
<i>BFNE-II</i>						
Mid-Group	-13.80	3.83	2.97	-12.09	-15.50	<.001
Post-Group	-25.92	5.26	6.22	-23.58	-28.27	<.001
Follow-Up	-25.36	5.52	6.18	-22.90	-27.82	<.001
<i>OASES-SII</i>						
Mid-Group	-20.33	7.64	2.63	-16.92	-23.73	<.001
Post-Group	-30.15	3.82	4.19	-25.99	-34.32	<.001
Follow-Up	-28.70	4.04	3.96	-24.36	-33.05	<.001
<i>SDQ</i>						
Mid-Group	-5.62	2.28	2.66	-4.60	-6.63	<.001
Post-Group	-9.44	2.50	4.48	-8.32	-10.55	<.001
Follow-Up	-9.10	2.52	4.42	-7.98	-10.23	<.001
<i>OASES (S-III)</i>						
Mid-Group	-20.96	7.62	2.37	-17.57	-24.36	<.001
Post-Group	-32.08	10.50	3.96	-27.40	-36.76	<.001
Follow-Up	-30.63	10.57	3.75	-25.91	-35.34	<.001
<i>OASES (S-IV)</i>						
Mid-Group	-17.83	8.52	2.13	-14.03	-21.63	<.001
Post-Group	-27.69	11.01	3.45	-22.78	-32.60	<.001
Follow-Up	-26.13	11.30	3.21	-21.10	-31.17	<.001
<i>AGE</i>						
Mid-Group	.10	.31	-0.10	.24	-.03	.26
Post-Group	.13	.34	-0.12	.28	-.02	.14
Follow-Up	.31	.47	-0.28	.52	.10	.001

Table 6.6: Effect Size of F & C Group Program in AWS at Mid-Treatment, Post-Treatment, and Follow-Up on Outcome Measures ( $N = 21$ )

Measures	Change in Score		Effect Size	95% CI		<i>p</i>
	<i>M</i>	<i>SD</i>		lower	upper	value
<b>% SS</b>						
Mid-Group	-2.27	1.98	.78	-1.01	-3.53	<.001
Post-Group	-3.67	2.96	1.37	-1.78	-5.57	<.001
Follow-Up	-3.13	2.75	1.15	-1.36	-4.89	<.001
<b>OASES-SI</b>						
Mid-Group	-21.48	8.29	2.76	-16.18	-26.77	<.001
Post-Group	-32.52	8.90	4.47	-26.84	-38.21	<.001
Follow-Up	-30.95	9.22	4.20	-25.06	-36.84	<.001
<b>STAI (state)</b>						
Mid-Group	-9.24	5.15	2.54	-5.95	-12.53	<.001
Post-Group	-16.48	5.20	4.79	-13.15	-19.80	<.001
Follow-Up	-15.67	5.27	4.50	-12.30	-19.04	<.001
<b>STAI (trait)</b>						
Mid-Group	-10.10	4.36	3.50	-7.31	-12.88	<.001
Post-Group	-15.76	3.14	7.35	-13.75	-17.77	<.001
Follow-Up	-15.29	3.23	6.93	-13.22	-17.35	<.001
<b>BFNE-II</b>						
Mid-Group	-15.57	5.17	2.66	-12.27	-18.88	<.001
Post-Group	-28.29	5.47	5.53	-24.79	-31.78	<.001
Follow-Up	-27.33	51.8	5.47	-24.03	-30.64	<.001
<b>OASES-SII</b>						
Mid-Group	-21.36	7.27	2.54	-16.72	-26.01	<.001
Post-Group	-31.40	9.78	4.03	-25.15	-37.65	<.001
Follow-Up	-30.10	10.26	3.87	-23.54	-36.65	<.001
<b>SDQ</b>						
Mid-Group	-5.67	2.18	3.38	-4.28	-7.06	<.001
Post-Group	-10.48	2.02	6.39	-9.19	-11.76	<.001
Follow-Up	-9.52	1.92	6.57	-8.30	-10.75	<.001
<b>OASES-SIII</b>						
Mid-Group	-20.69	5.66	2.33	-17.07	-24.30	<.001
Post-Group	-31.66	10.19	3.99	-25.15	-38.17	<.001
Follow-Up	-30.10	10.25	3.79	-23.55	-36.64	<.001
<b>OASES-SIV</b>						
Mid-Group	-16.69	8.70	1.69	-11.13	-22.24	<.001
Post-Group	-26.44	11.25	2.89	-19.25	-33.63	<.001
Follow-Up	-25.26	11.47	2.79	-17.93	-32.58	<.001

Table 6.6 (cont): Effect Size of F & C Group Program in AWS at Mid-Treatment, Post-Treatment, and Follow-Up on Outcome Measures ( $N = 21$ )

Measures	Change in Score		Effect Size	95% CI		<i>P</i> value
	<i>M</i>	<i>SD</i>		lower	upper	
<b><i>SOC (PRE)</i></b>						
Mid-Group	6.24	5.67	-1.34	9.86	2.61	<.001
Post-Group	-4.91	5.87	1.24	-1.15	-8.66	<.01
Follow-Up	-5.48	5.52	1.42	-1.95	-9.00	.001
<b><i>SOC (CONT)</i></b>						
Mid-Group	3.24	6.39	-0.69	7.32	.85	.19
Post-Group	7.14	6.60	-1.51	11.36	2.92	<.001
Follow-Up	5.71	6.81	-1.23	10.07	1.36	<.01
<b><i>SOC (ACT)</i></b>						
Mid-Group	4.62	4.85	-1.22	7.72	1.52	<.01
Post-Group	11.43	5.10	-3.18	14.69	8.17	<.001
Follow-Up	10.52	5.10	-2.99	13.79	7.26	<.001
<b><i>SOC (MAIN)</i></b>						
Mid-Group	1.14	4.79	-0.33	4.20	-1.91	1.00
Post-Group	4.76	4.50	-1.48	7.63	1.89	.001
Follow-Up	9.05	4.87	-2.74	12.16	5.94	<.001
<b>AGE</b>						
Mid-Group	.14	.36	-0.15	.37	.09	.50
Post-Group	.14	.36	-0.15	.37	.09	.50
Follow-Up	.24	.44	-0.26	.52	.04	.13



#### 6.3.4.3 Parents of CWS

Effect sizes for each psychosocial variable measure in parents of children who stutter are displayed in 6.7. According to Cohen's conventions (Cohen, 1988), large and significant treatment effects at Mid-Group, Post-Group and Follow-Up were observed for all measures.

Table 6.7: Effect Size of Investing in Parents Group Program on Parents of CWS at Mid-Treatment, Post-Treatment, and Follow-Up on Outcome Measures ( $N = 39$ )

Measures	Change in Score		Effect Size	95% CI		<i>p</i> value
	<i>M</i>	<i>SD</i>		lower	upper	
<b><i>OASES-SI</i></b>						
Mid-Group	-24.59	5.68	4.24	-22.06	-27.12	<.001
Post-Group	-37.60	6.68	6.78	-34.63	-40.58	<.001
Follow-Up	-35.81	6.56	6.38	-32.89	-38.73	<.001
<b><i>OASES-SII</i></b>						
Mid-Group	-26.02	8.78	3.23	-22.10	-29.93	<.001
Post-Group	-37.93	3.60	5.01	-33.60	-42.27	<.001
Follow-Up	-35.95	10.27	4.71	-31.37	-40.53	<.001
<b><i>SDQ</i></b>						
Mid-Group	-8.00	2.64	3.74	-6.83	-9.18	<.001
Post-Group	-13.00	3.03	6.05	-11.65	-14.35	<.001
Follow-Up	-11.72	3.03	5.56	-10.37	-13.07	<.001
<b><i>OASES-SIII</i></b>						
Mid-Group	-27.41	7.63	3.34	-24.01	-30.81	<.001
Post-Group	-39.67	8.96	5.43	-35.68	-43.66	<.001
Follow-Up	-37.44	9.64	5.17	-33.14	-41.73	<.001
<b><i>OASES-SIV</i></b>						
Mid-Group	-23.82	8.62	2.87	-19.97	-27.66	<.001
Post-Group	-35.96	10.54	4.52	-31.26	-40.66	<.001
Follow-Up	-34.17	10.76	4.29	-29.38	-38.97	<.001

#### 6.3.4.4 Parents of AWS

Effect sizes for each psychosocial variable measure in parents of adolescents who stutter are displayed in 6.8. According to Cohen's conventions (Cohen, 1988), large and significant treatment effects at Mid-Group, Post-Group and Follow-Up were observed for all measures.

Table 6.8: Effect Size of Investing in Parents Group Program on Parents of AWS at Mid-Treatment, Post-Treatment, and Follow-Up on Outcome Measures ( $N = 21$ )

Measures	Change in Score		Effect Size	95% CI		<i>p</i> value
	<i>M</i>	<i>SD</i>		lower	upper	
<b><i>OASES-SI</i></b>						
Mid-Group	-24.09	10.10	3.02	-17.64	-30.54	<.001
Post-Group	-37.43	10.31	4.75	-30.84	-44.01	<.001
Follow-Up	-34.90	10.34	4.43	-28.30	-41.51	<.001
<b><i>OASES-SII</i></b>						
Mid-Group	-24.63	7.75	3.54	-19.69	-29.58	<.001
Post-Group	-37.14	8.85	5.62	-31.49	-42.79	<.001
Follow-Up	-34.89	9.20	2.30	-29.02	-40.76	<.001
<b><i>SDQ</i></b>						
Mid-Group	-8.33	2.20	5.57	-6.93	-9.74	<.001
Post-Group	-13.43	1.91	9.95	-12.21	-14.65	<.001
Follow-Up	-11.52	1.83	8.87	-10.35	-12.70	<.001
<b><i>OASES-SIII</i></b>						
Mid-Group	-25.67	9.12	2.60	-19.85	-31.50	<.001
Post-Group	-37.84	12.44	4.17	-29.89	-45.79	<.001
Follow-Up	-35.25	12.53	3.89	-27.25	-43.25	<.001
<b><i>OASES-SIV</i></b>						
Mid-Group	-22.25	8.23	3.00	-16.99	-27.51	<.001
Post-Group	-35.24	9.05	4.93	-29.46	-41.02	<.001
Follow-Up	-33.11	9.17	4.74	-27.25	-38.96	<.001

### 6.3.5 Between Group Comparisons: Repeated Measures MANOVA

A MANOVA was used to compare the scores between CWS and Parents of CWS on each of the measures Pre-Group, Mid-Group, Post-Group and Follow-Up. Group means (and standard deviations) for each dependent variable are presented in Table 6.9.

#### 6.3.5.1 CWS and Parents of CWS

##### *Impairment in Body Function*

The MANOVA indicated that there was a significant difference between the CWS and parents of CWS on the self-awareness and knowledge of stuttering (OASES-SI) impact ratings,  $F(4, 73) = 7.72$ ,  $p < .001$ , partial  $\eta^2 = .30$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the CWS self-awareness and knowledge of stuttering (OASES-SI) impact ratings were significantly lower compared to the parent's perception of child's self-awareness and knowledge of stuttering (OASES-SI) impact ratings at the pre-group time-point,  $F(1, 76) = 27.76$ ,  $p < .001$ , partial  $\eta^2 = .27$ .

##### *Personal Factors / Reactions*

There was a significant difference between the CWS and parents of CWS on the reactions to stuttering (OASES-SII) impact ratings,  $F(4, 73) = 4.49$ ,  $p < .001$ , partial  $\eta^2 = 1.00$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the CWS reactions to stuttering (OASES-SII) impact ratings were significantly lower compared to the parent's perception of child's reactions to stuttering (OASES-SII) impact ratings at pre-group,  $F(1, 76) = 12.88$ ,  $p = .001$ , partial  $\eta^2 = .15$ ; and mid-group,  $F(1, 76) = 7.25$ ,  $p < .01$ , partial  $\eta^2 = .09$ .

Table 6.9: Means and Standard Deviations for CWS and Parents of CWS at Pre-Group, Mid-Group, Post-Group, and Follow-up

Measures	CWS		Parents (CWS)		<i>p</i> value	<i>partial</i> $\eta^2$
	(N = 39)		(N = 39)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<b><i>OASES-SI</i></b>						
Pre-Group	57.82	8.28	67.20	7.43	<.001	.27
Mid-Group	40.82	3.95	42.62	3.45	.04	.06
Post-Group	28.87	2.70	29.60	2.52	.22	.02
Follow-Up	30.10	2.78	31.39	2.78	.04	.05
<b><i>OASES-SII</i></b>						
Pre-Group	59.93	9.99	68.27	10.53	.001	.15
Mid-Group	39.61	4.40	42.26	4.30	.01	.09
Post-Group	29.78	1.94	30.34	1.98	.21	.02
Follow-Up	31.23	2.34	32.33	2.36	.04	.05
<b><i>SDQ</i></b>						
Pre-Group	13.85	2.56	17.18	2.69	<.001	.29
Mid-Group	8.23	1.53	9.18	1.39	<.01	.10
Post-Group	4.41	1.52	4.18	1.41	.49	.01
Follow-Up	4.74	1.39	5.46	1.29	.02	.07
<b><i>OASES-SIII</i></b>						
Pre-Group	64.10	11.17	72.45	10.05	.001	.14
Mid-Group	43.14	5.66	45.05	5.83	.15	.03
Post-Group	32.02	2.60	32.78	2.39	.18	.02
Follow-Up	33.48	2.93	35.02	1.92	<.01	.09
<b><i>OASES-SIV</i></b>						
Pre-Group	56.94	11.21	66.09	11.11	.001	.15
Mid-Group	39.12	3.86	42.28	3.73	<.001	.15
Post-Group	29.25	1.76	30.13	1.72	.03	.06
Follow-Up	30.81	2.59	31.92	1.83	.03	.06

### *Environmental Factors*

There was a significant difference between the CWS and parents of CWS scores on behavioural and social difficulties (SDQ),  $F(4, 73) = 15.26$ ,  $p < .001$ , partial  $\eta^2 = .46$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the CWS demonstrated behavioural and social difficulties (SDQ) scores which were significantly lower compared to the parent's perceptions of child's behavioural and social difficulties (SDQ) scores at pre-group,  $F(1, 76) = 31.38$ ,  $p < .001$ , partial  $\eta^2 = .29$ ; and mid-group,  $F(1, 76) = 8.20$ ,  $p < .01$ , partial  $\eta^2 = .10$ .

There was a significant difference between the CWS and parents of CWS on the communication difficulties in daily situations (OASES-SIII) impact ratings,  $F(4, 73) = 5.10$ ,  $p = .001$ , partial  $\eta^2 = .22$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the CWS demonstrated communication difficulties in daily situations (OASES-SIII) impact ratings which were significantly lower compared to the parent's perceptions of child's communication difficulties in daily situations (OASES-SIII) impact ratings at pre-group,  $F(1, 76) = 12.04$ ,  $p = .001$ , partial  $\eta^2 = .14$ ; and follow-up,  $F(1, 76) = 7.53$ ,  $p < .01$ , partial  $\eta^2 = .09$ .

### *Quality of Life*

There was a significant difference between the CWS and parents of CWS on the quality of life (OASES-SIV) impact ratings,  $F(4, 73) = 4.21$ ,  $p < .01$ , partial  $\eta^2 = .19$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the CWS reported significantly lower quality of life (OASES-SIV) compared to the parent's perception of child's quality of life (OASES-SIV) at pre-group,  $F(1, 76) = 13.11$ ,  $p = .001$ , partial  $\eta^2 = .15$ ; and mid-group,  $F(1, 76) = 13.51$ ,  $p < .001$ , partial  $\eta^2 = .15$ .

A MANOVA was used to compare the scores between AWS and parents of AWS on each of the psychosocial variable measures at Pre-Group, Mid-Group, Post-Group and Follow-Up. Group means (and standard deviations) for each dependent variable are presented in Table 6.10.

#### 6.3.5.2 AWS and Parents of AWS

##### *Impairment in Body Function*

The MANOVA indicated that there was a non-significant difference between the AWS and parents of AWS scores on the self-awareness and knowledge of stuttering (OASES-SI) impact ratings,  $F(4, 37) = 2.00$ ,  $p = .11$ , partial  $\eta^2 = .30$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the AWS reported self-awareness and knowledge of stuttering (OASES-SI) which was non-significantly lower compared to the parent's perceptions of adolescents self-awareness and knowledge of stuttering (OASES-SI) at all time-points.

##### *Personal Factors / Reactions*

There was a significant difference between the AWS and parents of AWS scores on the reactions to stuttering (OASES-SII) impact ratings,  $F(4, 37) = 3.18$ ,  $p = .02$ , partial  $\eta^2 = .26$ . However, using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the AWS reactions to stuttering (OASES-SII) were non-significantly lower compared to the parent's perceptions of adolescents reactions to stuttering (OASES-SII) at all time-points.

Table 6.10: Means and Standard Deviations for AWS and Parents of AWS at Pre-Group, Mid-Group, Post-Group, and Follow-up

Measures	AWS		Parents (AWS)		<i>p</i> value	<i>partial</i> $\eta^2$
	(N = 21)		(N = 21)			
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
<b><i>OASES-SI</i></b>						
Pre-Group	61.43	10.01	66.85	10.86	.10	.07
Mid-Group	39.95	4.60	42.77	3.06	.03	.12
Post-Group	28.90	2.36	29.43	2.46	.49	.01
Follow-Up	30.48	2.87	31.95	2.44	.08	.08
<b><i>OASES-SII</i></b>						
Pre-Group	61.97	10.84	68.19	9.11	.05	.09
Mid-Group	40.60	4.92	43.56	3.75	.04	.11
Post-Group	30.57	2.04	31.05	2.08	.46	.01
Follow-Up	31.87	1.86	33.30	1.96	.02	.13
<b><i>SDQ</i></b>						
Pre-Group	14.48	1.75	17.19	1.50	.001	.42
Mid-Group	8.81	1.60	8.86	1.49	.92	.00
Post-Group	4.00	1.52	3.76	1.18	.57	.01
Follow-Up	4.95	1.07	5.67	1.06	.04	.11
<b><i>OASES-SIII</i></b>						
Pre-Group	64.61	11.05	71.17	12.68	.08	.07
Mid-Group	43.92	5.96	45.50	5.87	.39	.02
Post-Group	32.95	1.92	33.33	1.98	.53	.01
Follow-Up	34.51	2.00	35.92	1.82	.02	.13
<b><i>OASES-SIV</i></b>						
Pre-Group	56.19	12.66	65.49	9.76	.01	.15
Mid-Group	39.50	5.85	43.24	3.87	.02	.13
Post-Group	29.75	2.64	30.25	2.62	.55	.01
Follow-Up	30.93	1.76	32.38	1.55	<.01	.17

### *Environmental Factors*

There was a significant difference between the AWS and parents of AWS scores on the behavioural and social difficulties (SDQ),  $F(4, 37) = 11.42$ ,  $p < .001$ , partial  $\eta^2 = .55$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the AWS behavioural and social difficulties (SDQ) scores were significantly lower compared to the parent's perceptions of adolescents behavioural and social difficulties (SDQ) scores at the pre-group time-point,  $F(1, 40) = 29.06$ ,  $p < .001$ , partial  $\eta^2 = .42$ .

There was a significant difference between the AWS and parents of AWS on the communication difficulties in daily situations (OASES-SIII) impact ratings,  $F(4, 37) = 2.61$ ,  $p = .05$ , partial  $\eta^2 = .22$ . However, using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the AWS communication difficulties in daily situations (OASES-SIII) were non-significantly lower compared to the parent's perceptions of adolescents communication difficulties in daily situations (OASES-SIII) at all time-points.

### *Quality of Life*

There was a significant difference between the AWS and parents of AWS on the quality of life (OASES-SIV) impact ratings,  $F(4, 37) = 3.15$ ,  $p = .02$ , partial  $\eta^2 = .25$ . Using a Bonferroni adjusted alpha level of .013, analysis of the dependent variables individually revealed that the AWS quality of life (OASES-SIV) impact ratings were significantly lower compared to the parent's perception of adolescents quality of life (OASES-SIV) at pre-group,  $F(1, 30) = 7.10$ ,  $p = .01$ , partial  $\eta^2 = .15$ ; and follow-up,  $F(1, 30) = 8.00$ ,  $p < .01$ , partial  $\eta^2 = .17$ .



### 6.3.6 Clinically Significant Change

All of the treatment outcomes measures in CWS and AWS were used to assess whether clinically significant change had occurred as a result of the holistic biopsychosocial treatment group program. The data used to calculate the statistics described by the Jacobson and Traux (1991) methodology are contained in Table 6.11. Cut-off *c* scores were calculated for the STAIC (state and trait anxiety), STAI (state and trait anxiety), BFNE-II (fear of negative evaluation), and SDQ (behavioural and social difficulties) outcome measures using the mean and standard deviation of the pre-treatment measures in this study and published standardised normative data from functional populations (STAIC, Speilberger, 1973; STAI, Speilberger, 1983; BFNE-II, Carleton et al., 2007; SDQ, Mellor, 2005). With respect to the OASES questionnaire outcome measures, no published normative data for a functional population currently exists; therefore cut-off *c* scores were calculated using the mean and standard deviation of the pre-treatment measures in this study and the normative data of the age/sex matched control population detailed in Chapter 3. With respect to %SS, a cut-off score criterion of less than 2%SS has been used clinically and in research studies to demonstrate that treatment was clinically successful (Andrews & Craig, 1988).

Children and adolescents who stutter were classified according to their degree of improvement using Jacobson's classification system (see Tables 6.11, 6.13).

Table 6.11: Data Used to Compute Cut-off  $c$  and the Reliable Change Index (Children,  $N = 39$ )

Symbol	Definition	% SS	OASES- SI	STAIC- S	STAIC- T	BFNE- II	OASES- SII	SDQ	OASES- SIII	OASES- SIV
$M_I$	Pretreatment mean of the study sample	4.47	57.82	47.18	47.28	43.39	59.93	13.85	64.10	56.94
$M_0$	Mean of well functioning control population	-	47.02	30.85	37.35	22.44	34.82	9.0	29.13	22.22
$S_I$	Standard deviation of the pre-treatment mean of the study sample	2.46	8.28	3.86	5.79	5.02	9.99	2.56	11.17	11.21
$S_0$	Standard deviation of the well functioning control population	-	8.39	5.86	6.50	12.71	6.00	5.6	6.81	5.01
$c$	Cut-off $c$ point	< 2.00	49.90	40.69	42.60	37.46	49.90	12.33	49.90	49.90
$r_{xx}$	Reliability of the measure	.86	.90	.86	.90	.94	.90	.79	.90	.90
$S_E$	Standard error of measurement of the measure (Pre-Mid)	.21	1.07	.71	.78	.61	1.22	.37	1.22	1.37
$S_E$	Standard error of measurement of the measure (Pre-Post)	.32	1.18	.80	.97	.84	1.50	.40	1.68	1.76
$S_E$	Standard error of measurement of the measure (Pre-FU)	.31	1.20	.85	1.01	.88	1.56	.40	1.69	1.81
$S_{DIFF}$	Standard error of difference between the two test scores (Pre-Mid)	.30	1.51	1.00	1.10	.86	1.73	.52	1.73	1.94
$S_{DIFF}$	Standard error of difference between the two test scores (Pre-Pst)	.45	1.67	1.13	1.37	1.19	2.12	.57	2.38	2.49
$S_{DIFF}$	Standard error of difference between the two test scores (Pre-FU)	.44	1.70	1.20	1.43	1.24	2.21	.57	2.39	2.56

Table 6.12: Rates of Clinical Improvement (using Cut-off c) for Pre-Group to Mid-Group, Post-Group and Follow-up (Children,  $N = 39$ )

Measures	% Recovered	% Improved	% Unchanged	% Deteriorated
<b>% SS</b>				
Pre-Mid	30.77	69.23	0	0
Pre-Post	79.49	20.51	0	0
Pre-Followup	74.36	0	0	25.64
<b>OASES- SI</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>STAIC (state)</b>				
Pre-Mid	71.79	28.21	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>STAIC (trait)</b>				
Pre-Mid	94.87	5.13	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>BFNE-II</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>OASES-SII</b>				
Pre-Mid	82.05	17.95	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>SDQ</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>OASES-SIII</b>				
Pre-Mid	46.15	53.85	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>OASES-SIV</b>				
Pre-Mid	5.13	94.87	0	0
Pre-Post	100	0	0	0
Pre-Followup	99.92	0	0	7.69

Table 6.13: Data Used to Compute Cut-off  $c$  and the Reliable Change Index (Adolescent,  $N = 21$ )

Symbol	Definition	% SS	OASES- SI	STAI-S	STAI-T	BFNE- II	OASES- SII	SDQ	OASES- SIII	OASES- SIV
$M_I$	Pretreatment mean of the study sample	5.32	61.43	56.38	57.24	47.62	61.97	14.48	64.61	56.19
$M_0$	Mean of well functioning control population	-	43.32	40.00	40.57	22.44	33.05	9.0	29.10	22.02
$S_I$	Standard deviation of the pre-treatment mean of the study sample	3.69	10.01	4.79	3.14	5.53	10.84	1.75	11.05	12.66
$S_0$	Standard deviation of the well functioning control population	-	8.59	11.30	10.58	12.71	5.39	5.6	6.33	5.82
$c$	Cut-off $c$ point	< 2.00	49.90	51.50	53.42	39.99	49.90	13.18	49.90	49.90
$r_{xx}$	Reliability of the measure	.86	.90	.86	.90	.94	.90	.79	.90	.90
$S_E$	Standard error of measurement of the measure (Pre-Mid)	.43	1.81	1.12	.95	1.13	1.59	.48	1.24	1.90
$S_E$	Standard error of measurement of the measure (Pre-Post)	.65	1.94	1.14	.69	1.19	2.14	.44	2.22	2.46
$S_E$	Standard error of measurement of the measure (Pre-FU)	.60	2.01	1.15	.70	1.13	2.24	.42	2.24	2.50
$S_{DIFF}$	Standard error of difference between the two test scores (Pre-Mid)	.61	2.56	1.58	1.34	1.60	2.25	.68	1.75	2.69
$S_{DIFF}$	Standard error of difference between the two test scores (Pre– Pst)	.92	2.74	1.61	.98	1.68	3.03	.62	3.14	3.48
$S_{DIFF}$	Standard error of difference between the two test scores (Pre-FU)	.85	2.84	1.63	.98	1.60	3.17	.59	3.17	3.54

Table 6.14: Rates of Clinical Improvement (using Cut-off c) for Pre-Group to Mid-Group, Post-Group and Follow-up (Adolescents,  $N = 21$ )

Measures	% Recovered	% Improved	% Unchanged	% Deteriorated
<b>% SS</b>				
Pre-Mid	33.33	66.67	0	0
Pre-Post	61.90	38.10	0	0
Pre-Followup	47.62	0	0	52.38
<b>OASES- SI</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>STAI (state)</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>STAI (trait)</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>BFNE-II</b>				
Pre-Mid	85.71	14.29	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>OASES-SII</b>				
Pre-Mid	61.90	38.10	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>SDQ</b>				
Pre-Mid	100	0	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>OASES-SIII</b>				
Pre-Mid	42.86	57.14	0	0
Pre-Post	100	0	0	0
Pre-Followup	100	0	0	0
<b>OASES-SIV</b>				
Pre-Mid	14.29	85.71	0	0
Pre-Post	90.48	9.52	0	0
Pre-Followup	90.48	0	0	9.52

## **6.4 DISCUSSION**

The effectiveness based research study detailed in this Chapter 6 examined the effectiveness of the concurrently run Fluency & Confidence and Investing in Parents group treatment program on stuttering speech severity and aspects of psychosocial functioning in children and adolescents who stutter. The exploration embraced a 6 month time frame and utilised assessment measures and treatment content which were incorporated into the Yaruss and Quesal (2004) model as a guiding therapeutic framework.

Consistent with previous child and adolescent therapeutic programs detailed in Chapter 1 (Craig et al., 1996; Hancock et al., 1998; Koushik et al., 2009; Lincoln et al., 1996; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006), this treatment effectiveness research study successfully demonstrated that the concurrently run Fluency & Confidence and Investing in Parents group treatment program was effective in ameliorating stuttering symptomatology with clinically meaningful outcomes.

In addition, the results presented in this Chapter 6 demonstrated that the group treatment program had a statistically significant and clinically significant effect on the stuttered speech and psychosocial functioning of the children and adolescents who participated. In contrast to the published treatment programs detailed and reviewed in Chapter 1 for children and adolescents who stutter (Craig et al., 1996; Hancock et al., 1998; Koushik et al., 2009; Lincoln et al., 1996; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006), the results presented in this Chapter 6 demonstrated an additional comprehensive assessment of the biopsychosocial functioning of the children and adolescents who stutter before, during and after the combined treatment program and provided further extensive documentation of the statistically and clinically significant biopsychosocial changes that occurred in these children and adolescents as a result of the treatment program.

The following section examines and discusses the treatment effectiveness and implications of the concurrently run Fluency & Confidence and Investing in Parents group treatment program on stuttering speech severity and aspects of psychosocial functioning in children and adolescents who stutter using the Yaruss and Quesal (2004) model components as a framework.

#### **6.4.1 Effectiveness Treatment Outcomes for Children/Adolescents who Stutter**

##### **6.4.1.1 Impairment in Body Function**

The combined concurrently run group treatment program was effective in significantly reducing stuttering for children and adolescents who stutter. The results showed that severity of stuttering was significantly and clinically reduced in the short term (mid-group and post-group) as shown by the large effect sizes ranging from .83 (mid-group) to 1.65 (post-group) in children and .78 (mid-group) to 1.37 (post-group) in adolescents. At the 8-week follow-up time-point, the reductions in stuttering were maintained with large effect sizes ranging from 1.53 (children) to 1.15 (adolescents). This is particularly noteworthy considering that a large effect size is considered to be 0.8 or greater (Cohen, 1988).

At the post-group time-point, 8 children and 8 adolescents persisted with a stuttering severity level greater than 2%SS and therefore were classified as *improved* rather than *recovered*. In all these cases, the stuttering severity level was below 3%SS in the children (range of 2.10 to 2.75) and adolescents (range of 2.10 to 2.95).

At the follow-up time-point, 10 children and 11 adolescents had a stuttering severity level greater than 2%SS. In all of the 10 children, the stuttering severity level was equal to or below 3%SS (range of 2.10 to 3.00), whereas in these 8 adolescents the stuttering severity level was below 3%SS (range of 2.10 to 2.95), in 2 adolescents the

stuttering severity level was between 3%SS and 4%SS (range of 3.10 to 3.50) and the in the remaining adolescent the severity of the stutter was 4.8%SS.

These results which demonstrate a statistically significant and clinically significant reductions in the severity of their stuttered speech which was maintained at low levels of stuttered severity at follow-up are comparable to the treatment effects observed in other existing individual and group child and adolescent published studies (Craig et al., 1996; Hancock et al., 1998; Koushik et al., 2009; Lincoln et al., 1996; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006).

The results from this study also demonstrated that the combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was effective in significantly improving knowledge and positive self-awareness of stuttering in children and adolescents. The self-awareness and knowledge of stuttering (OASES-SI) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes ranging from 2.62 (mid-group) to 4.70 (post-group) in children and 2.76 (mid-group) to 4.47 (post-group) in adolescents. At the 8-week follow-up time-point, the reductions in stuttering were maintained with large effect sizes ranging from 4.49 (children) to 4.20 (adolescents). Again, this is impressive considering that a large effect size is considered to be 0.8 or greater (Cohen, 1988).

At the post-group and follow-up time-points, all children and adolescents were classified as *recovered*. In all these cases, the self-awareness and knowledge of stuttering (OASES-SI) scores were below the clinically significant cut-off level which further verifies the clinical effectiveness of the group treatment program.

Currently, there are limited published research studies which use this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). These results obtained from this study are novel in that the complete form of the OASES questionnaire has not



previously been used in published research in populations of children or adolescents who stutter. These results demonstrate the use of a more comprehensive biopsychosocial framework of assessment and treatment demonstrate additional insightful information.

#### 6.4.1.2 Personal Factors / Reactions

In this study the measures of state and trait anxiety (STAIC or STAI), social anxiety (BFNE-II) and reactions to stuttering (OASES-SII) were chosen to reflect personal factors and reactions to the stuttering disorder in children and adolescents who stutter.

The combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was very effective in significantly reducing personal factors/reactions to stuttering in children and adolescents who stutter. The results showed that state and trait anxiety, social anxiety and reactions to stuttering were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes.

At the post-group and follow-up time-points, all children and adolescents were classified as *recovered*. In all these cases, the state and trait anxiety (STAIC, STAI), social anxiety (BFNE-II) and reactions to stuttering (OASES-SII) scores was below the clinically significant cut-off levels which further verifies the clinical effectiveness of the group treatment program.

As mentioned previously, there are currently limited published research studies which use this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). To date, the incorporation of a psychosocial perspective to the assessment and treatment of the stuttering disorder in children and adolescents has only been documented in a limited

number of previous research studies (Craig et al., 1996; Hancock et al., 1998; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). These results reinforce the benefits of using a more comprehensive biopsychosocial framework for the assessment and treatment of children and adolescents who stutter which promotes a broader conceptualisation of the stuttering disorder in children and adolescents beyond the surface symptoms. It is clinically empowering to additionally demonstrate that after participation in this biopsychosocial group treatment program, the previously elevated state, trait and social anxiety were reduced statistically and clinically.

It has been reported by Craig (1990) in a previous study in adults that following their involvement in an intensive behaviour therapy program, trait anxiety scores of adults who stutter regressed to normal levels. This finding, and the finding from the current study, has significant theoretical implications. According to Endler and Parker (1990), trait anxiety is a fixed personality characteristic. This definition lends to the assumption that, if elevated anxiety is indeed a trait characteristic of people who stutter, then irrespective of the remediation or successful management of the disorder, elevated anxiety levels will endure (Davis et al., 2007). In view of Craig's (1990) findings, and the findings documented in this study, one might argue that in the area of stuttering, trait anxiety, by traditional definition, is null and void.

#### 6.4.1.3 Environmental Factors

In this study the measures of behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII) were chosen to reflect environmental factors of the stuttering disorder in children and adolescents who stutter.

The combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was very effective in significantly reducing environmental factors of stuttering in children and adolescents who stutter. The results showed that

behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII) were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes.

At the post-group and follow-up time-points, all children and adolescents were classified as *recovered*. In all these cases, the behavioural and social difficulties (SDQ) and communication difficulties in daily situations (OASES-SIII) scores were below the clinically significant cut-off level which further validates the clinical effectiveness of the group treatment program.

The aim of this study was to provide a new biopsychosocial perspective for the assessment and treatment of children and adolescents who stutter based on the currently limited published research studies which use this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). The results presented reinforce the benefits of using a more comprehensive biopsychosocial framework for the assessment and treatment of children and adolescents who stutter which promotes a broader conceptualisation of the stuttering disorder in children and adolescents beyond the surface symptoms.

#### 6.4.1.4 Quality of Life (OASES-SIV)

In this study the impact of stuttering on the child or adolescent's quality of life was measured using the OASES-SIV.

The combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was very effective in significantly and clinically enhancing quality of life in children and adolescents who stutter. The results demonstrated that quality of life (OASES-SIV) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes.

At the post-group time-point, all 39 children and 19 adolescents were classified as *recovered*, with the remaining 2 adolescents classified as *improved* rather than *recovered*. At the follow-up time-point, 3 children and 2 adolescents were classified as *deteriorated* rather than *recovered*. This slight elevation in the quality of life scores could be considered an early warning sign or indicator of possible future relapse.

While it has been noted by certain researchers that quality of life is a potentially important measure when assessing the impact of stuttering (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009), quality of life research assessing the impact of stuttering in adults who stutter has only recently been undertaken (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Franic & Bothe, 2008; Craig et al., 2009) and there is very limited literature assessing the impact of stuttering on quality of life in children and adolescents. As a result of the findings that have been documented in this thesis (Chapters 3-5), it is clear that in this cohort of children and adolescents that they were experiencing poor quality of life prior to participating in the group treatment program. As mentioned previously, the primary aim of this study, and the previous documented studies (Chapters 3 – 5), was to provide a preliminary catalyst for future developments in the practice of biopsychosocial assessment and treatment of the stuttering disorder in children and adolescents. The results presented here further reinforces the advantages of using a more comprehensive biopsychosocial framework for the assessment and treatment of children and adolescents who stutter as it provides the documentation of statistically and clinically significant improvements in the overall quality of life of the children and adolescents in addition to the statistically and clinically significant reduction of their stuttering symptoms.

The following section examines and discusses the responses provided by parents of the children and adolescents who stutter on the OASES (Parent version, Appendix D)

and the SDQ (Parent version). The OASES (Parent version) ask the parents about their perceptions of their child/adolescent's experience of stutter, whereas the SDQ (Parent version) ask the parents about their perceptions of their child/adolescent's behavioural and social difficulties.

#### **6.4.2 Treatment Outcomes of Parents of Children/Adolescents who Stutter**

It is without doubt, that parents play an essential, and in most cases, a primary role in their child's development. Through nurturing and education, parents provide their child with an important foundation on which values, beliefs and ideas are built, exchanged and transferred. In addition, parents provide their child with working models of relationships and interactions with people around them (Engels et al., 2001). This concurrently run child and parent group program has harnessed the pervasive influence parents have on their children and utilised the communication and interaction between parents, children and adolescents to assist the children and adolescents not only with their stuttered speech behaviour but also with their psychosocial difficulties.

The results thus far have demonstrated that the integrated treatment program had a statistically significant and clinically significant effect on the stuttered speech and psychosocial functioning of the children and adolescents who participated. In addition, the inclusion of parents in the concurrently run holistic treatment program has had a statistically significant and clinically significant effect on the knowledge base and perceptions of parents of children/adolescents who stutter regarding their child/adolescent's overall functioning and well-being.

##### **6.4.2.1 Impairment in Body Function**

The combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was effective in significantly improving the parent's

perceptions of their child/adolescent's knowledge and positive self-awareness of stuttering. The parent's perceptions of their child/adolescent's knowledge and positive self-awareness of stuttering (OASES-SI) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes ranging from 4.24 (mid-group) to 6.78 (post-group) in parents of children and 3.02 (mid-group) to 4.75 (post-group) in parents of adolescents. At the 8-week follow-up time-point, the parent's perceptions of their child/adolescent's knowledge and positive self-awareness of stuttering (OASES-SI) scores were maintained with large effect sizes ranging from 6.38 (parents of children) to 4.43 (parents of adolescents).

Four treatment approaches used by clinical researchers for school-age children and adolescents who stutter were presented in Chapter 1. These four contemporary treatment approaches were chosen to illustrate different theoretical models resulting in the treatment and measurement of diverse clinical outcomes. However, one of the similarities between the four contemporary treatment approaches was the degree to which the child's parents were involved in the treatment process.

It was common within these four stuttering treatment programs that the parents were involved either at the beginning of the treatment program as active change agents or alternatively, once increased fluency had been achieved, as part of the inherent generalisation and maintenance of treatment program effects. Both the Lidcombe program (Harrison et al., 2010; Koushik et al., 2009) and the home-based version of the Smooth Speech and Cognitive Behavior Therapy program (Craig et al., 1996; Hancock et al., 1998) required the parent to be the child's clinician, and Craig et al. (1996) suggested that the home-based version may have been slightly more effective because of the parent's role as the clinician. This was particularly significant given the older age of the children in the research on the home-based cohort (i.e., a mean age of 10.5 years with a range of 9 to 14 years), indicating that adolescents respond effectively to their

parent as their speech clinician. In the clinic-based Smooth Speech and Cognitive Behavior program, parents also assumed an active role from the commencement of the treatment program through facilitating the child's practice of fluency skills at home. The Fluency Rules program (Runyan & Runyan, 1991) also involved parents and other family members, however this did not happen until after fluency skills were learned within the clinic and the child began to work on transferring these skills to other everyday environments. The family involvement in the Comprehensive Treatment program (Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006; Yaruss et al., 2010) was different compared to the previous three treatment programs. In this treatment program, emphasis was placed on parents' understanding of the nature of the stuttering and acceptance that the child may always stutter to some extent during their life-span. In this treatment program, rather than assist the child to practice fluency skills, parents of children in the Comprehensive Treatment program strived to create an environment in which stuttering was accepted and allowed, thereby liberating the child to communicate freely with and without stuttering.

The group treatment program significantly improved the parent's perceptions of their child/adolescent's knowledge and positive self-awareness of stuttering. The results obtained from this study are unique for a number of reasons. Firstly, the version of the OASES questionnaire which was provided to parents has not previously been used in published research. Secondly, within the research literature, there is a lack of research studies which assess parent's perceptions of their child's psychosocial functioning before, during and after a comprehensive treatment program. These findings support the implementation of a biopsychosocial framework for the assessment and treatment of children and adolescents who stutter. Within this biopsychosocial framework, this study incorporated additional quantitative data and information from

the parents of the children and adolescents who stutter, in the hope of obtaining a more holistic assessment of the impact of stuttering on their child or adolescents.

It is clinically relevant to demonstrate that after participation in this biopsychosocial group treatment program, the parents reported significantly greater positive attributes in their children and more balanced perspectives on their speech, psychological, behavioural and social life skills in general.

#### 6.4.2.2 Personal Factors / Reactions

The combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was effective in significantly improving the parent's perceptions of their child/adolescent's reactions to stuttering. The parent's perceptions of their child/adolescent's reactions to stuttering (OASES-SII) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes. At the 8-week follow-up time-point, the parent's perceptions of their child/adolescent's reactions to stuttering (OASES-SII) scores were maintained with large effect sizes ranging from 4.71 (parents of children) to 2.30 (parents of adolescents).

The group treatment program significantly improved the parent's perceptions of their child/adolescent's affective, behavioural and cognitive reactions to their stuttering. As mentioned previously, the results obtained from this study are unique within the available literature. Firstly, the version of the OASES questionnaire which was provided to parents has not previously been used in published research. Secondly, within the research literature, there is a lack of research studies which assess parent's perceptions of their child's psychosocial functioning before, during and after a comprehensive treatment program. The findings documented from this study further supports the use of a biopsychosocial framework for the assessment and treatment of



children and adolescents who stutter. In addition, this study incorporated additional quantitative data and information from the parents of the children and adolescents who stutter, in the hope of obtaining a more holistic assessment of the impact of stuttering on their child or adolescents.

#### 6.4.2.3 Environmental Factors

In addition, the results demonstrated that the combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was effective in significantly improving the parent's perceptions of their child/adolescent's behavioural and social difficulties. The parent's perceptions of their child/adolescent's behavioural and social difficulties (SDQ) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes. At the 8-week follow-up time-point, the parent's perceptions of their child/adolescent's behavioural and social difficulties (SDQ) were maintained with large effect sizes ranging from 5.56 (parents of children) to 8.87 (parent's of adolescents).

In contrast to the parent version of the OASES, the parent version of the Strengths and Difficulties questionnaire (SDQ) is well documented in the literature with good test-retest reliability and long term stability (Achenbach et al., 2008). This questionnaire is designed to assess the parent's perception of their child/adolescent's internalising and externalising behaviours as well as social adjustment (Mellor, 2004).

It is not unusual for parents of children who stutter to perceive their children as more insecure, sensitive, anxious, withdrawn, fearful, and introverted than fluent peers (Fowlie & Cooper, 1978) or more reactive, less able to regulate their emotions, and less able to regulate their attention than fluent peers (Karass et al., 2006) prior to treatment. What is clinically relevant about the results obtained in this study is that after the parents and children/adolescents participated in this biopsychosocial group treatment

program, the parents reported significantly improved perceptions of their children/adolescent's behavioural and social difficulties.

Therefore, while speech disfluency is an essential feature, the stuttering disorder in children and adolescents is intertwined with other domains including psychosocial, emotional and environmental factors (Karass et al., 2006; Yairi, 2007) and the parent's perceptions of the impact of the stuttering disorder on their child/adolescents is clinically relevant.

In addition, the findings documented in this Chapter 6 demonstrated that the group treatment program was effective in significantly improving the parent's perceptions of their child/adolescent's communication difficulties (OASES-SIII). The parent's perceptions of their child/adolescent's communication difficulties (OASES-SIII) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes. At the 8-week follow-up time-point, the parent's perceptions of their child/adolescent's communication difficulties (OASES-SIII) were maintained with large effect sizes ranging from 5.17 (parents of children) to 3.89 (parents of adolescents).

The findings which are documented are unique within the available literature. Within the research literature there is a substantial lack of research studies which assess the parent's perceptions of their child's psychosocial functioning in school, home and social environments before, during and after a comprehensive treatment program. Collectively, the results obtained from the two questionnaires within this Environmental component framework support the premise that when assessing and treating children and adolescents who stutter, we need to broaden our conceptualisation beyond the surface behaviours to incorporate other psychosocial functioning.

#### 6.4.2.4 Quality of Life (OASES-SIV)

The combined concurrently run Fluency & Confidence and Investing in Parents group treatment program was effective in significantly improving the parent's perceptions of their child/adolescent's quality of life. The parent's perceptions of their child/adolescent's quality of life (OASES-SIV) scores were significantly and clinically reduced in the short term (mid-group and post-group) as shown by the very large effect sizes. At the 8-week follow-up time-point, the parent's perceptions of their child/adolescent's quality of life (OASES-SIV) were maintained with large effect sizes ranging from 4.29 (parents of children) to 4.74 (parents of adolescents).

The group treatment program significantly improved the parent's perceptions of their child/adolescent's quality of life. As mentioned previously, the results obtained from this study are unique within the available literature as the version of the OASES questionnaire which was provided to parents has not previously been used in published research. The findings documented from this study further supports the use of a biopsychosocial framework for the assessment and treatment of children and adolescents who stutter, while obtaining additional psychosocial information from significant others.

The results collectively have reiterated the strength of the biopsychosocial treatment program on the stuttered speech and on the psychosocial functioning of these children and adolescents who stutter while potentially effecting on the parent's knowledge base and perceptions of their child/adolescent's psychosocial functioning.

This area of quality of life research is in its infancy within the stuttering literature and has only recently been investigated in adults who stutter (Klompas & Ross, 2004; Yaruss & Quesal, 2006; Craig et al., 2009). As mentioned previously, there is currently limited literature assessing the impact of stuttering on quality of life in children and adolescents, and even less literature on the parent's perceptions of their

child/adolescent's quality of life before, during and after treatment. As mentioned previously, the primary aim of this study, and the previous documented studies (Chapters 3 – 5), was to provide a preliminary catalyst for future developments in the practice of biopsychosocial assessment and treatment of the stuttering disorder in children and adolescents. The results presented here further reinforces the advantages of using a more comprehensive biopsychosocial framework for the assessment and treatment of children and adolescents who stutter as it provides the documentation needed to assess and treat psychosocial difficulties in children and adolescents.

The following section examines and discusses a comparison between the responses provided by children/adolescents who stutter on the OASES (Child and Adolescent version, Appendix A) and the responses provided by parents of the children/adolescents who stutter on the OASES (Parent version, Appendix D). The OASES (Child and Adolescent version) asks the child or adolescent about their personal assessment of their experience of stuttering whereas the OASES (Parent version) ask the parents about their perceptions of their child/adolescent's experience of stuttering. In addition, a comparison is made between the behavioural and social difficulties experienced by the child/adolescent (SDQ-Child/Adolescent version) and the parent's perception of the behavioural and social difficulties experienced by the child/adolescent (SDQ-Parent version).

### **6.4.3 Comparison of Children and Adolescents Who Stutter with Parents of**

#### **Children and Adolescents who Stutter**

##### **6.4.3.1 Impairment in Body Function**

In this study, prior to participation in the Fluency & Confidence group program (Pre-Group, T1), self-awareness and knowledge of stuttering experience (OASES-SI)

was assessed in children and adolescents who stutter and their parents. The scores demonstrated that parents scored significantly higher on the self-awareness and knowledge of stuttering experience (OASES-SI) assessment compared to the children and non-significantly higher compared to adolescents. The parents appeared less self-aware and knowledgeable than their children/adolescents regarding their child/adolescent's stuttering experience. Ultimately, the parents were interpreting that the stuttering disorder impacted upon their child/adolescent significantly more than the child/adolescent reported.

Although the parent's scored higher on the self-awareness and knowledge of stuttering experience (OASES-SI) assessment than the children/adolescents, the scores that the children/adolescents obtained on the self-awareness and knowledge of stuttering experience (OASES-SI) assessment still corresponded to the moderate-to-severe impact rating (Yaruss and Quesal, 2004), therefore, realistically both the parent and child/adolescent cohorts were very concerned and worried about the impact of the stuttering disorder on their functioning however both the parent and child/adolescent cohorts lacked the foundation of knowledge necessary to manage the stuttering disorder.

The combined group treatment program was effective in concomitantly and significantly improving the child/adolescent's self-awareness and knowledge of their stuttering experience, and the parent's perceptions of their child/adolescent's knowledge and positive self-awareness of their stuttering experience. This improvement resulted in a non-significant difference between the scores of the parents and their children/adolescents by the conclusion of the treatment program (Post-Group, T3). Both groups had a more functional self-awareness and improved knowledge that permitted evolution of a similar viewpoint between that parent and child/adolescent cohorts in addition to a cohesiveness when participating in the stuttering treatment program.

#### 6.4.3.2 Personal Factors / Reactions

Prior to participation in the Fluency & Confidence and Investing in Parents group treatment program (Pre-Group, T1), reactions to stuttering (OASES-SII) was assessed in children and adolescents who stutter and their parents. The scores obtained demonstrated that parents scored significantly higher on the reactions to stuttering (OASES-SII) assessment compared to the children/adolescents. The children/adolescents reported a lower level of negative reactions to their stuttering compared to their parent's perception. This finding demonstrates that parents perceived that the stuttering disorder impacted significantly more on the emotional, behavioural and cognitive well-being of their children/adolescents compared to the level of impact that the children/adolescents reported.

Although the parents scored significantly higher on the reactions to stuttering (OASES-SII) assessment than the children/adolescent cohorts, the scores that were obtained on the reactions to stuttering (OASES-SII) assessment from the children/adolescent cohorts corresponded to the moderate-to-severe impact rating. Both the parent and children/adolescent groups revealed legitimate concerns regarding the emotional, behavioural and cognitive impact of stuttering on the well-being of the children/adolescents.

The combined group treatment program was effective in concomitantly and significantly improving the children/adolescent's reactions to their stuttering, and the parent's perceptions of their children/adolescent's reactions to their stuttering. This concurrent improvement resulted in a non-significant difference between the scores of the parents and their children/adolescents at the end of the treatment program (Post-Group, T3). Again, the benefits of the combined intervention for both the parent and children/adolescent groups brought about successful clinical changes.

#### 6.4.3.3 Environmental Factors

In this study, prior to participation in the Fluency & Confidence and Investing in Parents group treatment program (Pre-Group, T1), behavioural and social difficulties (SDQ) was assessed in children and adolescents who stutter and their parents. The scores that were obtained demonstrated that parents scored significantly higher on the SDQ assessment compared to their children/adolescents.

Prior to the commencement of the group program (Pre-Group, T1), children and adolescents reported less behavioural and social difficulties compared to their parents. This result demonstrates how parents infer that the stuttering disorder impacts more significantly on the behavioural and social difficulties of their children/adolescents than the child realises, accepts or reports. The scores for both the parent and children/adolescent groups were consistently assessed as above published normal clinical limits.

The treatment improvement resulted in a non-significant difference between the scores of the parents and their children/adolescents at the conclusion of the treatment program (Post-Group, T3). Again, there is an improved alliance of understanding and belief between the children/adolescent and parent participants in this group treatment program.

An additional environmental factor assessed in this study included the communication difficulties in daily situations (OASES-SIII). Prior to participation in the Fluency & Confidence and Investing in Parents group treatment program (Pre-Group, T1), communication difficulties in daily situations (OASES-SIII) was assessed in children and adolescents who stutter and their parents. The scores that were obtained demonstrated that parents scored significantly higher on the communication difficulties in daily situations (OASES-SIII) assessment compared to their children. This result

supports the premise that parents perceive that the stuttering disorder impacted more significantly on the ability of their children/adolescents to engage in communicative activities than the children/adolescents believed, acknowledged or reported.

As with previous finding in this study, the parents scored significantly higher on the communication difficulties in daily situations (OASES-SIII) assessment than the children/adolescents, the scores that the children/adolescents obtained on the communication difficulties in daily situations (OASES-SIII) assessment corresponded to the moderate-to-severe impact rating which again is clinically impacting and important.

The combined group treatment program was effective in improving the communication difficulties of the children/adolescents, and the parent's perceptions of the children/adolescents communication difficulties. Such gains demonstrate how the communication changes that occurred in the children/adolescent cohorts as a result of the combined treatment programs reassured parents and allowed them to encourage their children/adolescents to be more independent and self reliant in their communication activities and challenges.

#### 6.4.3.4 Quality of Life (OASES-SIV)

Prior to participation in the Fluency & Confidence and Investing in Parents group treatment program (Pre-Group, T1), quality of life (OASES-SIV) was assessed in children and adolescents who stutter and their parents. The scores that were obtained demonstrated that parents scored significantly higher on the quality of life (OASES-SIV) assessment compared to their children. This result demonstrates that parents identified that the stuttering disorder impacted more significantly on the quality of life of their children/adolescents compared to the impact that the child believed that the stuttering disorder impacted on their quality of life.



Again, the parents scored significantly higher on the quality of life (OASES-SIV) assessment than the children/adolescents, the scores that the children/adolescents obtained on the quality of life (OASES-SIV) assessment corresponded to the moderate impact rating. This clinical impact underscores the total impact of stuttering on social, educational and family communication exchanges.

The combined group treatment program was effective in concomitantly and significantly improving the children/adolescent's quality of life, and the parent's perceptions of their children/adolescent's quality of life. At the Post-Group time-point (T3), both the parent and children/adolescent cohorts showed stronger confidence in the children/adolescent's abilities to interface verbally across many domains for themselves.

#### **6.4.4 Clinical Management of Children and Adolescents who Stutter**

##### **6.4.4.1 Children and Adolescents who Stutter**

The effectiveness of the biopsychosocial group treatment program for children and adolescent who stutter which was outlined and evaluated in this study, effects broader domains of well-being than just stuttering symptomatology. These improvements are noteworthy considering the developmental clinical importance of the older child and adolescent age groups.

The children and adolescents who participated in the concurrently run Fluency & Confidence and Investing in Parents group treatment program demonstrated statistically significant and clinically significant reductions in the severity of their stuttered speech as well as reductions across all psychosocial variables that were measured. Impressively, these clinically significant gains achieved by the children and adolescents who participated in the Fluency & Confidence group program were maintained at follow-up. The Fluency & Confidence and Investing in Parents group treatment

program demonstrated a large treatment effect in ameliorating stuttering symptoms with clinically meaningful outcomes, which was comparable to treatment effects observed in other existing individual and group child and adolescent published studies (Craig et al., 1996; Hancock et al., 1998; Koushik et al., 2009; Lincoln et al., 1996; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). In addition, as a result of the biopsychosocial framework of the treatment program, statistically and clinically significant biopsychosocial changes were also documented in these children and adolescents who stutter.

These results clearly demonstrate that the concurrently run Fluency & Confidence and Investing in Parents group treatment program is a powerful clinical tool in the reduction, and in some cases elimination of stuttering while providing positive clinical psychosocial support for children and adolescents who stutter.

The findings from this clinical effectiveness research study have important therapeutic implications for the treatment of children and adolescents who stutter. To date, the incorporation of a psychosocial perspective to the assessment and treatment of stuttering in children and adolescents who stutter has only been documented in a limited number of previous research studies (Craig et al., 1996; Hancock et al., 1998; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). Previous clinical effectiveness treatment research in the past for children and adolescents who stutter have focused on the measurement of stuttering severity and symptomatology to the exclusion of other important outcomes, such as psychosocial functioning and quality of life. The goal of this study was to provide a preliminary catalyst for future developments in the practice of biopsychosocial assessment and treatment of stuttering disorders in children and adolescents.

Treatment outcomes in health and wellbeing research are often defined in terms of symptomatology or pathology. It is evident from the results and findings presented in

this study that this definition is far too narrow. Clinicians interested in the full scope of assessment and treatment of children and adolescents who stutter should embrace a broader definition of clinical outcome that includes psychological and social well-being (Gladis, Gosch, Dishuk, & Crits-Christoph, 1999).

#### 6.4.4.2 Parents of Children and Adolescents who Stutter

Parent responsibilities in the successful management of stuttering are fundamental and documented frequently. Since stuttering is typically a developmental disorder beginning in early childhood and parents are the most influential factors in the child's learning, successful intervention necessitates participation on the part of parents and caregivers (Bottrill et al., 1991; Conture, 1990, 2001; Conture & Schwartz, 1984; Ham, 1986; Johnson, et al., 1967; Peters & Guitar, 1991; Riley & Riley, 1983; Rustin, 1987; Starkweather et al., 1990).

The parents who participated in the concurrently run Fluency & Confidence and Investing in Parents group treatment program demonstrated statistically significant and clinically significant reductions on all assessments of their perceptions of their children/adolescent's psychosocial dysfunction. In addition, these clinically relevant improvements in the perceptions of their children/adolescent's psychosocial dysfunction were maintained two months later at the follow-up assessment.

The parents gained insight, knowledge and practical strategies with which to help their children/adolescents. The strategies extended beyond those for stuttered speech behaviours and dealt with crucial emotional and behavioural challenges. The parents became their own support base and shared parenting and life perspectives. Through weekly meetings and the structure of the group activities, the parents were able to accumulate the necessary information and develop stronger and more confident coping strategies to assist their children/adolescents (Rustin & Cook, 1995).

#### **6.4.5 Limitations and Future Directions**

There are a number of specific limitations of this study which restrict the conclusions that can be drawn. The limitations and resultant future research directions are evaluated and discussed below.

##### **6.4.5.1 Self-Report**

As mentioned previously, this study and each of the research studies detailed in Chapters 3-5 relied on self-report measures to assess the various psychosocial variables under investigation. This form of quantitative measurement presents a number of issues, including the operation of response bias and shared variance between the measures. In addition, the complete form of the OASES questionnaire has not previously been used in published research in populations of children or adolescents who stutter, or parents of children or adolescents who stutter, and the validity and reliability in these cohorts have not yet been established. In reality, however, self-report methods are currently one of few available methodologies for the collection of subjective data and questionnaires widely accepted as valid and reliable (Turk & Melzack, 1992).

Subsequent research might consider alternate sources of data such as qualitative research methods or information obtained by significant others to verify and cross-validate the self-report responses of children and adolescents who stutter. An attempt was made in this current study to obtain quantitative data and information from the parents of children and adolescents who stutter in the hope of obtaining a more holistic assessment of the impact of stuttering on the child or adolescents. Future research studies may incorporate qualitative interviews of parents or significant others such as siblings into the research evaluation process.

#### 6.4.5.2 Children and Adolescent Cohorts

The sample of children and adolescents who were assessed and treated in this effectiveness based study represented a specific sub-set of young people who stutter, given that they were drawn from the Wait-List for an innovative biopsychosocial Fluency & Confidence group treatment program specifically run by the Curtin University Stuttering Treatment Clinic. Thus the findings cannot be considered representative of all children and adolescents who stutter living in the community. However, these children and adolescents who stutter may be considered indicative of children and adolescents who stutter presenting for treatment that had previously been provided with speech pathology therapy interventions which have been deemed by either the clinician or parents not to have achieved significant improvement or success.

The results presented in this Chapter 6 appeared to suggest that irrespective of the length of history of failed therapy from previous speech therapy treatments, severity of stuttered speech, typography of the stuttered speech, age of the child or adolescent to whom it was administered, or clinical level of psychosocial dysfunction, the Fluency & Confidence and Investing in Parents group treatment program proved extremely successful both statistically and clinically. It is important that future research studies with larger sample sizes replicate the treatment effects that have been documented in this thesis in a broader heterogeneous population of children and adolescents who stutter. Replication of this study using a larger sample size would enable investigation of the strength and universality of the treatment effects documented in this Chapter 6 in a larger and more diverse population of children and adolescents who stutter. It is hoped that future studies will investigate and provide empirical support for a biopsychosocial approach to the assessment and treatment of children and adolescents who stutter.

#### 6.4.5.3 Adolescents who Accept and Decline Treatment

As documented in Chapter 4, 15 out of a total of 36 adolescents who stutter were referred and expressed preliminary interest in the group treatment program and then prior to the commencement of the group treatment program they declined the invitation to attend. Although several biopsychosocial differences were documented between the adolescents who accepted and participated in the treatment program and the adolescents who declined the treatment program, it is unclear whether the 15 adolescents that declined to participate in the treatment program would have had similar treatment effects to the 21 adolescents who accepted and participated in the treatment program. It is possible, due to the high attrition rate of adolescents prior to the commencement of the treatment program that sampling bias or confounding factors may have impacted on the final treatment effectiveness outcome results that were obtained in the adolescents who stutter cohorts.

The strength of the findings documented in Chapter 4 and the resultant clinical implications highlighted the clinical need to provide a modified version of the Fluency and Confidence and Investing in Parents group treatment program. A new version has now been devised for adolescents and their parents incorporating the addition of a 4 week 'preparation for change' treatment phase in which the adolescents and their parents are seen individually prior to commencing the group programs. The purpose of this 'preparation for change' treatment phase is to address and support the barriers that have been identified and described in this study. The new flexible version has enabled continued engagement with previously disengaged adolescents. Future research will involve the evaluation of the effectiveness of this new modified version of the Fluency and Confidence and Investing in Parents group treatment program for adolescents.

#### 6.4.5.4 Effectiveness Based Research Study

This research study was an effectiveness based research study in which the children and adolescents within this study were not randomised to a control non-treatment or usual care group. The motivation for this effectiveness based study was clinical in nature. The Curtin University Stuttering Treatment Clinic is a centre offering specialised clinical expertise and is respected as a second opinion clinic for previously unsuccessful stuttering treatments. Each child and adolescent had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success.

Based on the presenting history of previously unsuccessful treatment for their stuttering disorder, it was a clinical research decision not to randomise these children or adolescent to a non-treatment control group. However, through a series of studies documented in this thesis (Chapter 3 and 5), it was demonstrated that the elevated state, trait and social anxiety; higher behavioural, social and communication difficulties; and overall poorer quality of life of these children and adolescents were replicable and remained elevated over the two month time-period prior to commencing the treatment program. It is important to note that this two month time-period was the identical duration of the treatment program (8 weeks) in which the statistically significant and clinical significant improvements in the severity of the stuttering and the psychosocial variables were demonstrated (current Chapter 6) and the identical duration of time between the end of the treatment program and follow-up (8 weeks) in which the improvements in the severity of the stuttering and the psychosocial variables were maintained (current Chapter 6). Therefore based on the clinical history of previously unsuccessful treatment for their stuttering disorder and the stability of stuttering severity, anxiety and psychosocial dysfunction of this cohort of children and

adolescents, the treatment effects demonstrated in this current Chapter 6 study are further verified and strengthened.

Subsequent research by other clinical researchers may choose to carry out efficacy based research in the form of a randomised controlled trial to assess the efficacy of this Fluency & Confidence and Investing in Parents group treatment program in order to demonstrate ‘cause-and-effect relationships’, however based on the overview detailed in Chapter 2 regarding effectiveness and efficacy based research practices, these efficacy based research studies will not be carried out by the author of this thesis in the near future.

#### 6.4.5.5 Follow-Up and Relapse Evaluations

This current study investigated the establishment of fluency and improvement of psychosocial dysfunction over an 8 week period as well as a maintenance period of 8 weeks. Areas of future direction could be to determine the durability and the maintenance of the group program’s treatment effect over a longer period of time post group and to elucidate possible predictors of relapse. At the conclusion of this current study, the long evaluation to determine whether the treatment effects were maintained was beyond the scope of this thesis and therefore the long term effectiveness and the robustness of the treatment effectiveness are still not known.

In the current study at the eight week follow-up time-point, 10/39 children and 11/21 adolescents had a stuttering severity level greater than 2%SS. In all of the 10 children, the stuttering severity level was equal to or below 3%SS (range of 2.10 to 3.00), whereas in these 8 adolescents the stuttering severity level was below 3%SS (range of 2.10 to 2.95), in 2 adolescents the stuttering severity level was between 3%SS and 4%SS (range of 3.10 to 3.50) and the in the remaining adolescent the severity of the stutter was 4.8%SS. In each of these cases, the children and adolescents who presented



with the most severe stuttering before the treatment program were the children and adolescents who demonstrated these elevated severity of stuttering levels at the follow-up time-point. This finding is consistent with the findings of other researchers (Andrews & Craig, 1988; Jones, Onslow, Harrison & Packman, 2000; Onslow and Packman, 1997). Andrews and Craig's (1988) stated that individuals who presented with more severe stuttering before a fluency inducing program, were more prone to relapses once they returned to their natural speaking environment. In addition, it has been found within paediatric population that when exposed to response contingent stimulation treatment, children with the most severe stuttering tended to be more prone to relapse (Jones, Onslow, Harrison & Packman, 2000; Onslow and Packman, 1997). This finding suggests that those who stutter more severely may require more intensive treatment over a longer time period to achieve long-term treatment success.

In the area of relapse prevention, certain clinicians and researchers have established additional treatments that are labelled 'anti-relapse' or booster therapies which have been stated to be effective at lowering relapse risk in older children (Craig et al., 2002; Hancock & Craig, 2002). These anti-relapse treatment programs have been proposed to be successful in producing significant reductions in stuttering and place greater emphasis on psychological components such as therapy which modifies negative attitudes towards stuttering, self-management therapy and relaxation therapy. These research findings suggest that a combined approach of initial treatment and anti-relapse/booster treatment can be successful in the long-term at reducing stuttering and removing speech-related fears and concerns (Craig et al., 2002; Hancock & Craig, 2002). An area of future research could be to elucidate possible predictors of relapse and to implement 'anti-relapse' or booster sessions to counteract the relapses.

#### 6.4.5.6 Therapeutic Alliance and Allegiance

It has been highlighted in the literature that common factors such as therapeutic alliance and allegiance positively influence treatment outcome (Ahn & Wampold, 2001; Herder, Howard, Nye, and Vanryckeghem, 2006; Wampold, Mondin, Moody, Stich, Benson, & Ahn, 1997; Wampold & Brown, 2005). Within this study there was no attempt to formally assess either the therapeutic alliance or allegiance relationship. Despite this lack of orchestrated rigor, the zero attrition rate demonstrated within this treatment effectiveness study was a reflection of how potent the therapeutic relationship may have been as the treatment program progressed. All children, adolescents and parents who commenced the Fluency & Confidence and Investing in Parents group treatment program attended for the full duration, completed the program successfully and were consistently available for the follow-up assessment which may reflect the strength of the therapeutic alliance. In addition, the Fluency & Confidence and Investing in Parents group treatment program was co-facilitated by the author of this thesis and the clinical coordinator of the Curtin University Stuttering Treatment Clinic, Janet Beilby. The two co-facilitators collaboratively developed the format of this biopsychosocial group treatment program and each facilitator clinically embraces a strong therapeutic allegiance to the biopsychosocial approach of assessing and treating stuttering in children, adolescents and adults. Therefore the effectiveness of this treatment program may in part be due to common factors such as therapeutic alliance and allegiance, expectations for improvement, and the clinical excellence of the clinicians (Ahn & Wampold, 2001).

In future research studies the strength of the therapeutic relationship should be concretely documented through quantitative questionnaires such as the Credibility Expectancy Questionnaire (Deville & Borkovec, 2000) and qualitative interviews to determine if these common factors contribute to a successful therapeutic outcome.

#### 6.4.5.7 Benefits of Group Program

From a clinical perspective, the group interactions contained within the Fluency & Confidence and Investing in Parents group treatment program were a cornerstone of the comprehensive treatment program and the activities that were possible in the group environment embraced and extended individual treatment initiatives. The group interactions also provided the clinicians with the opportunity to monitor the client's progress in a social context (Conture, 2001). The potency of group dynamics provided the opportunity for individual clients and clinicians to deal with questions concerning psychosocial issues associated with daily living, feelings of loneliness, dependency, and future fears. Guided group discussions reduced anxiety and allowed the members to improve the quality of their decision making, including the many interpersonal aspects of their lives.

Future research program could document these aspects of the group interactions and dynamics more specifically and quantitatively. Certain aspects of the group dynamics could be evaluated with the use of recording devices and blinded off-line assessment and comparison of therapeutic alliance and allegiance. In addition, the effectiveness of the group treatment program compared to a individual treatment program could be evaluated by comparing the core biopsychosocial components of the Fluency & Confidence and Investing in Parents treatment program in the group or individual setting.

#### 6.4.5.8 Adherence to Strategies

Within this treatment program the adherence to strategies being advocated as part of the program were not quantitatively or qualitatively measured. It is assumed that adherence is an essential requirement for a self-management approach such as this to be

effective, and that this is much more difficult to assess than in studies of other types of treatment, such as medication in medical research. Informal, non specific measures of adherence were used in the group treatment program, however, in future studies it may be important to evaluate the adherence to strategies more comprehensively to determine if adherence or non-adherence to the strategies advocated impacts on the effectiveness of the treatment program.

#### 6.4.5.9 Biopsychosocial Theories, Models and Supportive Data

It has been stated by the developers of the biopsychosocial model (Yaruss and Quesal, 2004) which is referred to and used extensively in this thesis that “the most pressing need related to this treatment approach is empirical documentation that it is effective in helping children who stutter improve their fluency, minimise negative reactions, and reduce the negative impact of this disorder on communication in daily activities and participation in life.” (Yaruss, Pelczarski, & Quesal, 2010, p.241). The primary goal of this study, and the documented previous studies (Chapters 3-5), was to provide a preliminary catalyst for future developments in the practice of biopsychosocial assessment and treatment of stuttering disorders in children and adolescents. The body of quantitative research described in this study used the findings from the cross-sectional assessment studies (Chapters 3-5) documented within this thesis to successfully expand the knowledge base of biopsychosocial effectiveness based treatments for children and adolescents who stutter.

Currently, there are limited published research studies which use this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). To date, the incorporation of a psychosocial perspective to the assessment and treatment of the stuttering disorder in children and adolescents has only been documented in a limited number of previous

research studies (Craig et al., 1996; Hancock et al., 1998; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). Therefore, more comprehensively tested biopsychosocial theories and models which account for the impact and consequences of stuttering in children and adolescents are urgently needed in order to drive research in this area. These biopsychosocial theories, models and research will assist in the development of more comprehensive assessments and treatments for children and adolescents who stutter.

## **6.5 Chapter Summary**

This chapter presented the results of a unique biopsychosocial group treatment program for children and adolescents who stutter alongside the concurrently run parent support group. The most important contribution made by this research is the confirmation of a clinically significant treatment outcome for this holistic and two faceted approach. Children and adolescents who participated in the group treatment program demonstrated clinically significant improvements in stuttering symptomology and psychosocial outcome variables. These clinically relevant improvements in stuttering symptomology and psychosocial outcome variables were maintained two months later at the follow-up assessment. The parents who participated in the group treatment program demonstrated statistically significant reductions on all assessments of their perceptions of their children/adolescent's psychosocial dysfunction. In addition, these clinically relevant improvements in the perceptions of their children/adolescent's psychosocial dysfunction were maintained two months later at the follow-up assessment. This group program had large treatment effects for significant sample population cohorts.

## **7.0 CONCLUSIONS**

The aim of this thesis was to provide a new biopsychosocial perspective for the assessment and treatment of children and adolescents who stutter. The body of research described in this thesis used quantitative and qualitative techniques to explore biopsychosocial issues pertinent to childhood and adolescent stuttering experiences and ensuing treatments. Barriers to treatment participation in group therapy were highlighted and subsequent recommendations made to future treatment initiatives. The thesis incorporated this body of knowledge into improved evidence-based assessments and treatments for young people with stuttering disorders.

Chapter 1 highlighted the need for a broader conceptualisation of stuttering to illuminate not only the surface behaviours present in an individual's speech, but also the psychosocial impact or consequences stuttering has on their life. Chapter 2 presented an overview of the innovative concurrently run Fluency & Confidence and Investing in Parent group program which was developed and implemented at the Curtin University Stuttering Treatment Clinic. Chapter 3 presented a cross-sectional analysis of psychosocial variables obtained from 75 children and adolescents who stuttered. These 75 children and adolescents were drawn from the Fluency & Confidence group program Wait-List and were assessed 8 weeks prior to commencement of the group intervention program. In addition, a cohort of 75 age and sex matched children and adolescents who did not stutter were compared according to the same psychosocial variables. Chapter 4 described qualitative and quantitative assessments of 21 AWS who accepted, participated and completed the Fluency & Confidence group program compared to 15 AWS who expressed preliminary interest in the treatment program and then declined the invitation to attend the group. Chapter 5 is the comparison of 60 children and adolescents at Wait-List and Pre-Group time-points (8 weeks apart) on a number of psychosocial variables and stuttered speech severity. Chapter 6 presented an evaluation

of the effectiveness of the concurrently run Fluency & Confidence and Investing in Parents group treatment program for 60 children and adolescents who stutter and their accompanying parents. Chapter 7 will constitute the overall summary of the thesis with conclusions drawn and implications highlighted for future clinical and theoretical research directions.

## **7.1 Overview of Findings**

### **7.1.1 Chapter 1: Literature Review**

The literature review provided in Chapter 1 highlighted the need for a broader conceptualisation of stuttering, which aims to not only delineate the surface behaviours present in an individual's speech, but also to illuminate the impact of the stuttering disorder on state, trait and social anxiety and inherent psychosocial variables. Conclusions were drawn regarding the need for a better understanding of the relationships between state, trait and social anxiety and the stuttering disorder in children and adolescents who stutter. In addition, impact of the stuttering disorder on the diverse psychosocial variables of behavioural and social difficulties, self-awareness of stuttering, reactions to stuttering, communication difficulties in daily situations, and quality of life was highlighted. Through this review of the literature, the biopsychosocial therapeutic framework developed by Yaruss and Quesal (2004) permitted and supported the holistic evaluation of the impact of the stuttering disorder on children and adolescents who stutter. Such a viewpoint had not been addressed in detail by previous research and provided one of the central tenets of this thesis. The biopsychosocial theoretical support for the links between anxiety, psychosocial variables and stuttering severity were then explored and detailed in the context of current treatment programs.

## **7.1.2 Chapter 2: Overview of Fluency & Confidence and Investing in Parents**

### **Group Programs**

A synopsis of the unique holistic biopsychosocial concurrently run Fluency & Confidence and Investing in Parents group treatment program was presented. The development and implementation of this group program was based on the biopsychosocial model of Yaruss and Quesal (2004) and the clinical expertise and evolution of clinical practice of the Curtin University Stuttering Treatment Clinic. Important conclusions detailed in this Chapter 2 specified the importance of parental involvement, group dynamics and the distinction between efficacy and effectiveness treatment research practices within the clinical setting.

## **7.1.3 Chapter 3: Wait-List for Fluency & Confidence Group Program**

This study explored the relationships between anxiety, psychosocial variables and stuttering severity. The findings that children and adolescents who stuttered had significantly higher levels of state, trait and social anxiety; higher behavioural, social and communication difficulties; and overall poorer quality of life proved sobering both statistically and clinically. The findings also challenge previous literature regarding the association between anxiety, psychosocial variables and the severity of stuttering. In this cohort of children and adolescents, the data supported and reinforced the Yaruss and Quesal (2004) model which depicted a framework in which the stuttering disorder could be viewed in terms of several interacting biopsychosocial components. These findings in children and adolescents who stutter make an important contribution to the wider literature regarding the impact of the stuttering disorder on anxiety and psychosocial variables in children and adolescents, especially given the limited number of studies published in this area to date.



The results reinforced the mandate for more integrated psychosocial treatments in the management of children and adolescents who stutter. In addition, the significant relationships between these psychosocial variables and the severity of stuttered speech reinforce the need for anxiety reducing, confidence enhancing and social life skills therapies when treating children and adolescents who stutter. Such interventions would address functional communication limitations and empower the children and adolescents. Although the specific content and success of such treatments are yet to be identified, the findings from this study suggest that a biopsychosocial approach to intervention would be most effective.

These results also highlight the need to be mindful of children and adolescents who stutter as a separate and unique cohort not to be conjoined with younger adult interventions. The thesis has demonstrated how older children and adolescents present with different priorities for therapy. It is recommended that a flexible and holistic view to treatment choices be adopted in management of young people and adolescents who stutter, as it is clear that these clients intrinsically differ in their symptoms and clinicians should respond uniquely to their individual stuttering experiences.

#### **7.1.4 Chapter 4: Barriers to Treatment for Adolescents**

Chapter 4 explored the relationships between anxiety, psychosocial variables and stuttering severity in the context of barriers which precluded adolescents from attending therapy. A mixed methods design incorporating qualitative semi-structured interviews and quantitative questionnaires was utilised to explore these barriers to treatment for these young adolescent people.

The analyses of the interview transcripts yielded a range of recurrent themes that were positioned within the components of the framework of the Yaruss and Quesal model (2004). All of the adolescents gave clear insights regarding the types of barriers

they experienced. The clusters and categories of themes described a combination of impairment in body function, personal, environmental, and quality of life factors and provide a context for the barriers experienced by the adolescents who stuttered. The most frequent theme of *Impairment in Body Function* was the limited knowledge and self-awareness possessed by adolescents regarding their stuttering behaviours. The most widespread *Personal Factor/Reaction* barriers were experiential avoidance and feelings of fear and embarrassment at the prospect of attending the group program. The most consistent *Environmental* barriers were the adolescents' perceptions of the negative impact of the group therapy environment plus the fear of judgement in the group environment by other participants and clinicians. The most common *Quality of Life* barrier to participating in the group was experiential avoidance. In addition, two adolescents reflected that they chose not to participate in the research group program because of previous negative experiences with randomised controlled trial therapeutic research programs.

Quantitative results detailed how adolescents who declined treatment were significantly older, had a greater stuttered speech severity rating, and were more likely to be placed in 'precontemplation' and 'contemplation' stages of readiness for change compared to adolescents who accepted and participated in treatment. The age difference between the two adolescent cohorts supported the general consensus that as adolescents become older and develop more independence and autonomy, it is difficult to attract them to treatment programs (Zebrowski, 2002). It is clear from these results that variations in approaches are needed for attracting older, more independent adolescents into therapy.

The majority of AWS who declined treatment were positioned between the 'precontemplation' and 'contemplation' stage of readiness for change. By contrast, the AWS who accepted and participated in treatment were positioned between the

‘contemplation’ and ‘action’ stage of readiness for change. This results therapeutically positions the AWS who declined treatment between a stage of not recognising a need for change (precontemplation) and ambivalence about change at present however an intention to change in the future (contemplation), whereas the AWS who accepted and participated in treatment were positioned between a stage of ambivalence about change at present however an intention to change in the future (contemplation) and tangible and deliberate change at some level (action). Such crucial distinctions between these two adolescent cohorts were statistically significant and reflected a powerful clinical guideline and tool for professionals poised to commence investment and therapeutic assistance for young people. The results detailed in this section suggest that the use of this questionnaire assessment which evaluates the adolescent’s stage of readiness for change may provide valuable insight and discrimination into their readiness and ability to engage in a treatment program.

The strength of these findings and the resultant clinical implications highlighted the need to provide a modified version of the Fluency & Confidence and Investing in Parents group treatment program. A new version has now been devised for adolescents and their parents incorporating the addition of a 4 week ‘preparation for change’ treatment phase in which the adolescents and their parents are seen individually prior to commencing the group programs. The purpose of this ‘preparation for change’ treatment phase is to address and support the barriers that have been identified and described in this study. The new flexible version has enabled continued engagement with previously disengaged adolescents.

### **7.1.5 Chapter 5: Wait-List and Pre-Group Time points for Children and**

#### **Adolescents who Stutter**

This study further explored the relationships between psychosocial variables and stuttered speech severity for children and adolescents at two distinct time-points (Wait-List and Pre-Group) separated by 8 weeks. Results confirmed how the psychosocial impact of the stuttering disorder which was demonstrated for this young cohort at Wait-List was sustained for the entire 8 week period. At Wait-List, the children and adolescents who stuttered reported statistically and clinically significant levels of impairment in body function (self-awareness of speaking ability), personal factors/reactions (state and trait anxiety, social anxiety and reactions to speaking ability), environmental factors (behaviour, social and communication difficulties in daily situations), and quality of life (activity limitations and participation restrictions) which remained elevated over this 8 week duration. The outstanding and unexpected feature of these findings were the stability and reliability of findings for these child and adolescent cohorts over time and provided a baseline assessment of various psychosocial variables prior to commencing the Fluency & Confidence group treatment program.

The findings also challenge previous literature regarding the association between anxiety, psychosocial variables and the severity of stuttering. In this cohort of children and adolescents, the data supported and reinforced the Yaruss and Quesal (2004) model which depicted a framework in which the stuttering disorder could be viewed in terms of several interacting biopsychosocial components. These answers, in addition to those presented in Chapter 3, make an important contribution to the wider literature regarding the impact of the stuttering disorder on anxiety and psychosocial variables in children and adolescents, especially given the limited number of studies published in this area to date.

### **7.1.6 Chapter 6: Effectiveness of Fluency & Confidence and Investing in Parents Group Programs**

The final research investigation presented in Chapter 6 detailed the effectiveness of the unique biopsychosocial Fluency & Confidence group program for children and adolescents who stutter alongside the concurrently run Investing in Parents support group. The most important contribution made by this research examination was the confirmation of a clinically significant treatment outcome for this holistic biopsychosocial two faceted approach.

Children and adolescents who participated in the group program demonstrated statistically and clinically significant improvements in stuttering symptoms and psychosocial outcome variables. In addition, their parents reported significantly greater positive attributes in their children and more balanced perspectives on their speech, psychological, behavioural and social life skills in general. This group program had very large treatment effects for the sample population cohorts. Impressively, these clinically significant gains achieved by the children and adolescents who participated in the Fluency & Confidence group program were maintained at follow-up. These results clearly demonstrate that the concurrently run Fluency & Confidence and Investing in Parents group treatment program was a powerful clinical tools in the reduction, or elimination of stuttering symptoms for children and adolescents who stutter. In addition, the group program provided the context of a commanding positive clinical psychosocial support base.

The holistic biopsychosocial group treatment program for children and adolescent who stutter, outlined and evaluated in Chapter 6, affected broader domains of well-being than just stuttering surface behaviours. These clinical improvements are noteworthy considering the developmental clinical importance of the child and adolescent age period. This research contributed to the understanding of effective

treatments for children and adolescents who stutter and the benefits of incorporating parents into this multi-faceted approach.

Treatment outcomes in health and wellbeing research are often defined in terms of symptoms, deficits or pathology. It is evident from the findings and results presented in this study that this definition is far too narrow. Clinicians and researchers interested in the full scope of assessment and treatment should embrace a broader definition of clinical outcomes that includes psychological and social well-being. The majority of previous clinical research in the past for children and adolescents who stutter has focused on the measurement of stuttering severity and symptoms to the exclusion of other important outcomes, such as psychosocial functioning and quality of life. As a result of the comprehensive findings presented in this thesis, it is clear that a more biopsychosocial holistic approach is warranted.

## **7.2 Limitations and Future Directions**

As with any research study, there are a number of significant limitations documented throughout the thesis which restricted the conclusions that could be drawn. The limitations and future research directions are evaluated and discussed below.

### **7.2.1 Self-Report Data Collection**

As mentioned previously, all of the research studies detailed in Chapters 3-6 relied on self-report measures to assess the various psychosocial variables under investigation. This form of quantitative measurement presents a number of issues, including the operation of response bias and shared variance between the measures. In addition, the complete form of the OASES questionnaire had not previously been used in published research in populations of children or adolescents who stutter, or parents of children or adolescents who stutter, and the validity and reliability in these cohorts had not yet been established. In reality, however, self-report methods are currently one of few available

methods for the collection of subjective data and questionnaire methodology are widely accepted as valid and reliable (Turk & Melzack, 1992).

Subsequent research might consider alternate sources of data such as qualitative research methods or information obtained by significant others to verify and cross-validate the self-report responses of children and adolescents who stutter. An attempt was made in Chapter 4 using qualitative research methods to obtain data which cross-validated and expanded the self-report responses of the adolescents who stutter who declined treatment. In addition, an attempt was made in Chapter 6 to obtain quantitative data and information from the parents of children and adolescents who stutter in the hope of obtaining a more holistic assessment of the impact of stuttering on the child or adolescents. Future research studies may incorporate qualitative interviews of parents or significant others such as siblings into the research evaluation process.

### **7.2.2 Cross-sectional Analysis**

The assessment studies detailed in Chapters 3-5 were cross-sectional in nature and thus no conclusions can be made regarding the causal relationship between the stuttering disorder and anxiety and psychosocial variables in children and adolescents who stutter. Although some psychosocial variables were referred to as outcomes, this does not suggest that they were caused by the stuttering disorder or alternatively cause the stuttering disorder, only that they were the psychosocial variables of most significance in terms of assessing the overall impact of the stuttering disorder on children and adolescents who stutter. Longitudinal studies of children and adolescents who stutter are essential to gain a better understanding of those factors that are prognostic in long-term adjustment to the stuttering disorder itself and to the impact of stuttering on other biopsychosocial areas of the child or adolescent's life.

### **7.2.3 Qualitative Data Collection**

The conclusions drawn from the study detailed in Chapter 4 were based partly on qualitative interviews with 15 adolescents who stutter and these adolescents may not be representative of the adolescents stuttering population generally. Specifically these 15 adolescents were representative of a sub-set of adolescents who declined participation in treatment and a depth of authenticity of themes were demonstrated for this adolescent cohort in that saturation of themes was reached within the study.

Established guidelines for ensuring methodological and interpretive rigor in qualitative research was followed in this study, however there is an element of interpretation inherent to qualitative research. The use of additional independent ‘blind’ researchers for the collection and analysis of data may have enhanced the validity of the results, however, this was not possible as part of this thesis process.

Future research studies which quantify and validate the findings reported in this study, and assess the effectiveness of a treatment program targeting the barriers and challenges reported by the adolescents who declined the treatment program, would be beneficial.

### **7.2.4 Quantitative Data Collection**

One limitation of the research thesis was the multiple statistical comparisons made of the data collected (i.e., multiple t-tests, multiple correlations, and multiple MRAs). In several instances within this thesis a Bonferroni correction was implemented to control for the increased risk of making Type I errors when conducting multiple comparisons on a single set of data. The Bonferroni correction involved dividing the conventional alpha level ( $\alpha = 0.05$ ) by the number of comparisons being made.



### **7.2.5 Additional Speech Measures**

The speech measures implemented in this research thesis were confined to the measurement of percentage of syllables stuttered (%SS). Future research will consider the additional measurement of syllables per minute (SPM) which is a measurement of the rate and speed of speech.

### **7.2.6 Children and Adolescent Cohorts**

The sample of children and adolescents who were assessed and treated throughout this thesis (Chapters 3-6) represented a particular sub-set of young people who stutter. These children and adolescents were drawn from the Wait-List for an innovative biopsychosocial Fluency & Confidence and Investing in Parents group treatment program specifically run by the Curtin University Stuttering Treatment Clinic. Thus the findings obtained throughout this thesis limit the degree to which the findings of the studies can be considered representative of all children and adolescents who stutter living in the community or can be generalised to other populations of children and adolescents who stutter. However, these children and adolescents who stutter may be considered to be indicative of children and adolescents presenting for treatment that had previously been provided with speech pathology therapeutic treatments which have been deemed unsuccessful by either their clinician or parents.

It is important that future research studies with larger heterogeneous samples of children and adolescents who stutter replicate the assessment and treatment studies documented in this thesis. Replication of these studies using larger heterogeneous cohorts would enable investigation of the strength and universality of the assessment and treatment effects documented in this thesis. It is hoped that future studies will investigate and provide empirical support for a biopsychosocial approach to the assessment and treatment of children and adolescents who stutter.

### **7.2.7 Adolescents who Accept and Decline Treatment**

As documented in Chapter 4, 15 out of a total of 36 adolescents who stutter were referred and expressed preliminary interest in the group treatment program and then prior to the commencement of the group treatment program they declined the invitation to attend. Although several biopsychosocial differences were documented between the adolescents who accepted and participated in the treatment program and the adolescents who declined the treatment program, it is unclear whether the 15 adolescents that declined to participate in the treatment program may have had similar treatment effect to the 21 adolescents who accepted and participated in the treatment program. It is possible, due to the high attrition rate of adolescents prior to the commencement of the treatment program that sampling bias or confounding factors may have impacted on the final treatment effectiveness outcome results documented that were obtained in the adolescents who stutter in Chapter 6.

The strength of the findings documented in Chapter 4 and the resultant clinical implications highlighted the clinical need to provide a modified version of the Fluency and Confidence and Investing in Parents group treatment program. A new version has now been devised for adolescents and their parents incorporating the addition of a 4 week 'preparation for change' treatment phase in which the adolescents and their parents are seen individually prior to commencing the group programs. The purpose of this 'preparation for change' treatment phase is to address and support the barriers that have been identified and described in this study. The new flexible version has enabled continued engagement with previously disengaged adolescents. Future research will involve the evaluation of the effectiveness of this new modified version of the Fluency and Confidence and Investing in Parents group treatment program for adolescents.

### **7.2.8 Age Differences Between Adolescents who Accept and Decline Therapy**

It is reasonable to assume that more autonomy and independent choice was afforded the older cohort in terms of choosing to attend or not attend therapy. It may be that the parents of the younger adolescents did not give them the option of deciding whether or not they attended the group program. Therefore, the inclusion of qualitative interviews with the parents of the adolescents who declined the group program may have also provided further insights to the barriers for adolescents of treatment programs. Future research could potentially demonstrate increased homogeneity between adolescents who stutter and their parents with such qualitative information.

### **7.2.9 Effectiveness Based Research Study**

This effectiveness based research study documented in Chapter 6 meant that the children and adolescents who stutter within this study were not randomised to a control non-treatment or usual care group. As mentioned previously, the motivation for this effectiveness based study was clinical in nature. The Curtin University Stuttering Treatment Clinic is a centre offering specialised clinical expertise and is respected as a second opinion clinic for previously unsuccessful treatments. Each child and adolescent who stuttered had formerly been provided with speech pathology therapy intervention but it had been deemed by either the clinician or parents not to have achieved significant improvement or success.

Based on the presenting history of previously unsuccessful treatment for their stuttering disorder, it was a clinical research decision not to randomise these children or adolescent to a non-treatment control group. However, through a series of studies documented in this thesis (Chapter 3 and 5), it was demonstrated that the elevated state, trait and social anxiety; higher behavioural, social and communication difficulties; and overall poorer quality of life of these children and adolescents were replicable and

remained elevated over this two month time-period prior to the commencement of therapy. It is important to note that this two month time-period was the identical duration of the treatment program (8 weeks) in which the statistically significant and clinical significant improvements in the severity of the stuttering and the psychosocial variables were demonstrated (Chapter 6) and the identical duration of time between the end of the treatment program and follow-up (8 weeks) in which the improvements in the severity of the stuttering and the psychosocial variables were maintained (Chapter 6). Therefore based on the clinical history of previously unsuccessful treatment for their stuttering disorder and the stability of stuttering severity, anxiety and psychosocial dysfunction of this cohort of children and adolescents who stutter, the treatment effects demonstrated in the Chapter 6 study are further verified and strengthened.

Future research by other clinical researchers may choose to carry out efficacy based research in the form of randomised controlled trials to assess the efficacy of this Fluency & Confidence and Investing in Parents group treatment program in order to demonstrate ‘cause-and-effect relationships’, however based on the overview detailed in Chapter 2 regarding effectiveness and efficacy based research practices, these efficacy based research studies will not be carried out by the author of this thesis in the near future.

#### **7.2.10 Replication of Findings**

The cross-sectional analyses studies, qualitative study and treatment effectiveness study documented in this thesis offer some tantalising hints about important relationships which may become targets for more effective treatment programs for children and adolescents who stutter. The distinctive biopsychosocial assessment and treatment findings for children and adolescents who stutter documented in this thesis necessitates that other researchers and further studies need to replicate these findings in a broader cohort of children and adolescents who stutter.

### **7.2.11 Follow-Up and Relapse Evaluations**

Chapter 6 investigated the establishment of fluency and improvement of psychosocial dysfunction over an 8 week period as well as a maintenance period of 8 weeks. Areas of future direction could be to determine the durability and the maintenance of the group program's treatment effect over a longer period post group and to elucidate possible predictors of relapse. At the conclusion of Chapter 6, the long evaluation to determine whether the treatment effects were maintained was beyond the scope of this thesis and therefore the long term effectiveness and the robustness of the treatment effectiveness are still not known.

Documented in Chapter 6, at the eight week follow-up time-point, 10/39 children and 11/21 adolescents had a stuttering severity level greater than 2%SS. In all of the 10 children, the stuttering severity level was equal to or below 3%SS (range of 2.10 to 3.00), whereas in these 8 adolescents the stuttering severity level was below 3%SS (range of 2.10 to 2.95), in 2 adolescents the stuttering severity level was between 3%SS and 4%SS (range of 3.10 to 3.50) and the in the remaining adolescent the severity of the stutter was 4.8%SS. In each of these cases, the children and adolescents who presented with the most severe stuttering before the treatment program were the children and adolescents who demonstrated these elevated severity of stuttering levels at the follow-up time-point. This finding was consistent with the findings of other researchers (Andrews & Craig, 1988; Jones, Onslow, Harrison & Packman, 2000; Onslow and Packman, 1997). Andrews and Craig's (1988) stated that individuals who presented with more severe stuttering before a fluency inducing program, were more prone to relapses once they returned to their natural speaking environment. In addition, it has been found within paediatric population that when exposed to response contingent stimulation treatment, children with the most severe stuttering tended to be more prone to relapse (Jones, Onslow, Harrison & Packman, 2000; Onslow and Packman, 1997).

In the area of relapse prevention, certain clinicians and researchers have established additional treatments that are labelled ‘anti-relapse’ or booster therapies which have been stated to be effective at lowering relapse risk in older children (Craig et al., 2002; Hancock & Craig, 2002). These anti-relapse treatment programs have been proposed to be successful in producing significant reductions in stuttering and place greater emphasis on psychological components such as therapy which modifies negative attitudes towards stutter, self-management therapy and relaxation therapy. These research findings suggest that a combined approach of initial treatment and anti-relapse/booster treatment can be successful in the long-term at reducing stuttering and removing speech-related fears and concerns (Craig et al., 2002; Hancock & Craig, 2002). An area of future research could be to elucidate possible predictors of relapse and to implement ‘anti-relapse’ or booster sessions to counteract the relapses.

#### **7.2.12 Therapeutic Alliance and Allegiance**

It has been highlighted in the literature that factors such as therapeutic alliance and allegiance positively influence treatment outcome (Ahn & Wampold, 2001; Herder, Howard, Nye, and Vanryckeghem, 2006; Wampold, Mondin, Moody, Stich, Benson, & Ahn, 1997; Wampold & Brown, 2005). Within the effectiveness based research study documented in Chapter 6, there was no attempt to formally assess either the therapeutic alliance or allegiance relationship. Despite this lack of orchestrated rigor, the zero attrition rate demonstrated within this treatment effectiveness study was a reflection of how potent the therapeutic relationship may have been as the treatment program progressed. As stated in Chapter 6, all children, adolescents and parents who commenced the Fluency & Confidence and Investing in Parents group treatment program attended for the full duration, completed the program successfully and were consistently available for the follow-up assessment which may reflect the strength of the

therapeutic alliance. In addition, the Fluency & Confidence and Investing in Parents group treatment program was consistently co-facilitated by the author of this thesis and the clinical coordinator of the Curtin University Stuttering Treatment Clinic, Janet Beilby. The two co-facilitators collaboratively developed the format of this biopsychosocial group treatment program and each facilitator clinically embraced a strong therapeutic allegiance to the biopsychosocial approach of assessing and treating stuttering in children, adolescents and adults. Therefore the effectiveness of this treatment program may in part be due to common factors such as therapeutic alliance and allegiance, expectations for improvement, and the clinical excellence of the clinicians (Ahn & Wampold, 2001).

In future research studies the strength of the therapeutic relationship should be concretely documented through quantitative questionnaires such as the Credibility Expectancy Questionnaire (Deville & Borkovec, 2000) and qualitative interviews to determine if these common factors contribute to a successful therapeutic outcome.

### **7.2.13 Benefits of Group Program**

From a clinical perspective, the group interactions documented in Chapter 6 and experienced within the Fluency & Confidence and Investing in Parents group treatment program were a cornerstone of the comprehensive treatment program and the activities that were possible in the group environment embraced and extended individual treatment initiatives. The group interactions also provided the clinicians with the opportunity to monitor the client's progress in a social context (Conture, 2001). The potency of group dynamics provided the opportunity for individual clients and clinicians to deal with questions concerning psychosocial issues associated with daily living, feelings of loneliness, dependency, and future fears. Guided group discussions

reduced anxiety and allowed the members to improve the quality of their decision making, including the many interpersonal aspects of their lives.

Future research program could document these aspects of the group interactions and dynamics more specifically and quantitatively. Certain aspects of the group dynamics could be evaluated with the use of recording devices and blinded off-line assessments and comparisons of therapeutic alliance and allegiance within the group domain. In addition the effectiveness of the group treatment program compared to individual treatment programs could be evaluated by comparing the core biopsychosocial components of the Fluency & Confidence and Investing in Parents treatment program in the group or individual setting.

#### **7.2.14 Adherence to Strategies**

Within the treatment program documented in Chapter 6 the adherence to strategies being advocated as part of the treatment program were not quantitatively or qualitatively measured. It is assumed that adherence is an essential requirement for a self-management approach in order to be effective, and that this is much more difficult to assess than in studies of other types of treatment, such as medication in medical research. Informal, non specific measures of adherence were carried out in the group treatment program, however, in future studies it may be important to evaluate the adherence to strategies more comprehensively to determine if adherence or non-adherence to the strategies advocated impacts on the effectiveness of the treatment program.

#### **7.2.15 Biopsychosocial Theories, Models and Supportive Data**

It has been stated by the developers of the biopsychosocial model (Yaruss and Quesal, 2004) which is referred to and used extensively throughout this thesis that “the



most pressing need related to this treatment approach is empirical documentation that it is effective in helping children who stutter improve their fluency, minimise negative reactions, and reduce the negative impact of this disorder on communication in daily activities and participation in life.” (Yaruss, Pelczarski, & Quesal, 2010, p.241). The body of research described in this thesis used qualitative and quantitative research methods to explore biopsychosocial issues pertinent to children and adolescent stuttering experiences. The findings from the assessment studies (Chapters 3-5) documented within this thesis were then explored and incorporated into the development of a biopsychosocial effectiveness based treatment program for children and adolescents who stutter (Chapter 6).

Currently, limited published research exists which uses this biopsychosocial approach for the assessment and treatment of children and adolescents who stutter (Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). To date, the incorporation of a psychosocial perspective to the assessment and treatment of stuttering in children and adolescents has only been documented in a limited number of previous research studies (Craig et al., 1996; Hancock et al., 1998; Murphy, Yaruss & Quesal, 2007a,b; Yaruss et al., 2006). The primary goal of this thesis was to provide a preliminary catalyst for future developments in the practice of biopsychosocial assessment and treatment of stuttering disorders in children and adolescents.

### **7.3 Final Comments**

Notwithstanding the acknowledged limitations of the cross-sectional assessment studies and the treatment effectiveness based research study documented in this thesis; there are a number of notable strengths of the program of research described in this thesis.

The current international literature in the area of a biopsychosocial approach to the assessment and treatment of children and adolescents who stutter is limited, and

research is urgently needed to establish even a very basic understanding of the ways in which the stuttering disorder may influence anxiety and psychosocial functioning. This thesis has taken a systematic approach to examining the impact of the stuttering disorder on anxiety and inherent psychosocial variables, and the potential role of a biopsychosocial approach for the assessment and treatment of children and adolescents who stutter.

Specifically, the fundamental aim of this thesis was to contribute a better understanding of the relationships between anxiety, psychosocial variables and stuttering severity in children and adolescents who stutter. Another primary focus was the incorporation of these new findings to successfully expand the knowledge base of biopsychosocial effectiveness based treatments for children and adolescents who stutter.

The program of research presented here has expanded the concept of the stuttering disorders beyond delineation of the surface behaviours. Inroads have been made into deeper layers regarding the biopsychosocial impact on the overall life experiences of the vulnerable young person. Finally, incumbent in the original challenge was the need to scope effectiveness based treatments for children and adolescents who stutter. These areas of research were original and ambitious. This thesis provides clinically pertinent answers to the goals of fluency and well-being for young individuals who stutter.

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## **APPENDIX A**

### **OVERALL ASSESSMENT OF THE SPEAKER'S EXPERIENCE OF STUTTERING (OASES) QUESTIONNAIRE: CHILDREN AND ADOLESCENTS WHO STUTTER**



















## **APPENDIX B**

### **OVERALL ASSESSMENT OF THE SPEAKER'S EXPERIENCE OF STUTTERING (OASES) QUESTIONNAIRE: CHILDREN AND ADOLESCENTS WHO **DO NOT** STUTTER**

















## **APPENDIX C**

STAGE OF CHANGE QUESTIONNAIRE (SOC):

ADOLESCENTS WHO STUTTER















## **APPENDIX D**

### **OVERALL ASSESSMENT OF THE SPEAKER'S EXPERIENCE OF STUTTERING (OASES) QUESTIONNAIRE: PARENTS OF CHILDREN AND ADOLESCENTS WHO STUTTER**















