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# Positive and Negative Expressions of Shyness in Toddlers: Are They Related to Anxiety in the Same Way?

Cristina Colonnesi, Elisa Napoleone, and Susan M. Bögels
University of Amsterdam

Shyness has generally been investigated as a negative and unpleasant emotional state, strongly related to social anxiety and loneliness. However, recent evidence has suggested that shyness may have a positive and socially adaptive form. We examined whether the positive expression of shyness differs from the negative expression of shyness during toddlerhood, and whether a negative relation to anxiety exists. Participants were 30-month-old children ($N$ = 102; 56 girls) who were asked to mimic animal sounds with a novel person (*performance*) and then to watch their performance (*self-watching*). Their expression of pleasure (positive reactions) and distress (negative reactions), as well as their positive and negative expressions of shyness, were coded. Children's temperamental level of shyness, sociability, and anxiety were measured with parent-reported questionnaires. Toddlers produced more positive and negative displays of shyness in the performance task than in the self-watching task. Children's positive expression of shyness was associated with lower parent-reported anxiety and higher sociability. Negative reactions, but not negative shyness, were related to children's higher anxiety levels and lower sociability. Multiple linear regression analyses confirmed a negative predictive role of the positive expression of shyness on anxiety. These results suggest that the positive expression of shyness can regulate early anxiety symptoms and already serves a social function in interpersonal interactions in early childhood.

*Keywords:* shyness, positive expression of shyness, temperament, coy smile, embarrassment, withdrawals, anxiety, social anxiety



Shyness is one of the most intriguing self-conscious emotional responses of human beings. It can be defined as the behavioral and emotional ambivalence (fear and pleasure) during social situations, expressed by the simultaneous approach and brief withdrawal from an interaction (Asendorpf, 1990; Lewis, 2001; Matsuda, Okanoya, Myowa-Yamkoshi, 2013; Reddy, 2005). Shyness can be a trait or a state. *Trait shyness* refers to a personality disposition (Kagan, Reznick, Snidman, Gibbons, & Johnson, 1988) or to a temperamental trait (Coplan & Rubin, 2010), while *state shyness* refers to an emotional reaction that everyone can experience in specific situations, such as contact with novel persons or during a performance (Asendorpf, 1990; Lewis, 2001). Infants and children usually display shyness with gaze or head aversion, body touching, or arm raising (Reddy, 2005). Extensive past research on shyness has focused specifically on trait shyness and its negative connotations and on the relation with anxiety (e.g., Buss, 1986; Kagan, 1997). According to this point of view, when children chronically react with a higher than average level of fear during social situations, they are considered at risk for social isolation, loneliness, and low self-esteem and for social anxiety disorder later in life (Henderson & Zimbardo, 2001; Turner, Beidel, & Townsley, 1990).

In contrast, recent research is focusing on the positive expression and function of shyness during infancy (i.e., coy smile) as a way to regulate emotions in anxiety-provoking situations and to enhance prosociality and trust (Colonnesi, Bögels, de Vente, & Majdandžić, 2013; Reddy, 2000, 2005). A similar reaction in adults is often defined as embarrassment and appears to have the same adaptive social function (Feinberg, Willer, & Keltner, 2012; Keltner, 1995; Keltner & Anderson, 2000; Keltner & Buswell, 1997). From this point of view, shyness, just as emotions like surprise or curiosity, can be experienced as a negative or a positive emotion, and it can be expressed in a negative as well as in a positive way (with or without a smile; Reddy, 2001, 2005). A long research tradition supports the presence of a relation between shyness and anxiety (Henderson & Zimbardo, 1998). However, we do not know whether the positive expression of shyness can be an adaptive way of regulating the emotion of fear and coping with social situation. In the present study, we investigated the extent to and the way in which toddlers' positive and negative expressions of shyness are related to their temperament and current level of anxiety.

## The Relation Between Shyness and Anxiety

Social anxiety disorder involves significant fear of scrutiny in one or more social situations, and excessive worry of negative evaluation by others (American Psychiatric Association, 2013).

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Cristina Colonnesi, Elisa Napoleone, and Susan M. Bögels, Research Institute of Child Development and Education, University of Amsterdam, Amsterdam, the Netherlands.

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Correspondence concerning this article should be addressed to Cristina Colonnesi, Research Institute of Child Development and Education, University of Amsterdam, Nieuwe Prinsengracht 130, 1018 VZ Amsterdam, the Netherlands. E-mail: c.colonnesi@uva.nl

Research in healthy and clinical populations found that high levels of social anxiety may already be present at preschool ages (Edwards, Rapee, Kennedy, & Spence, 2010; Furniss, Beyer, & Guggenmos, 2006), and this may be associated with a high risk of chronicity of social anxiety in later development (Weissman et al., 1999). In addition, during childhood, a strong relation exists between social anxiety and other anxieties that are associated with social situations, namely, separation anxiety and generalized anxiety (Edwards et al., 2010; Spence, 1998; Spence, Rapee, McDonald, & Ingram, 2001). Separation anxiety is characterized by inappropriate and excessive anxiety in situations in which one is separated from attachment figures, including social situations, while generalized anxiety is more pervasive in that it concerns anxiety and worry in a variety of domains (e.g., family, health, finances, and school or work difficulties) including social situations (American Psychiatric Association, 2013).

There are similarities between the definition of anxiety and that of shyness as a negative emotional trait. Indeed, shyness has been defined as the tendency to avoid social situations due to feeling anxious and uncomfortable (Henderson & Zimbardo, 1998) and the worry of being evaluated by others (Buss, 1980; Crozier, 1979). Because of the related definition and features, shyness has traditionally been considered a logical precursor of anxiety, in particular social anxiety (Henderson & Zimbardo, 1998). In some studies, shyness and social anxiety were considered synonymous (i.e., Rapee, 1998), whereas in other studies, social anxiety was defined as an extreme form of shyness (Henderson & Zimbardo, 1998; Marshall & Lipsett, 1994).

Despite the strong relation postulated between shyness and anxiety, to be a shy person or to express shy emotions does not necessarily imply being a (socially) anxious person. The prevalence of people who consider themselves shy is considerably higher than the prevalence of people presenting a social anxiety disorder: 20%–48% for shyness (Carducci & Zimbardo, 1995; Henderson & Zimbardo, 1998), 3%–5% for social anxiety disorder in children and adolescents at any given time (Costello, Mustillo, Erkanly, Keeler, & Angold, 2003; Ford, Goodman, & Meltzer, 2003; Rapee, Schniering, & Hudson, 2009), and 10%–15% for social anxiety disorder in adults as a lifetime prevalence (Bögels et al., 2010). Along the same lines, research on adolescents has shown that only 12%–18% of the youth who perceived themselves as shy also met criteria for lifetime social anxiety disorder (Burstein, Ameli-Grillon, & Merikangas, 2011; Heiser, Turner, & Beidel, 2003). Moreover, the study of Heiser et al. (2003) showed that shyness severity only accounted for 22% of the variance in social anxiety disorder. These results suggest that shyness is a broader and more heterogeneous construct than social anxiety (Heiser et al., 2003), with a lower level of social impairment (Turner et al., 1990). Likewise, shyness and anxiety, although positively related, are not components of a single underlying construct (Rapee, 2010). These results also support the assumption of Carducci (1999) that shyness is not a social disease or a mental illness, but "merely a normal facet of personality" (p. 6).

Research examining individual predisposing factors to both shyness and anxiety has mainly focused on temperament, in particular, behavioral inhibition (Essex, Klein, Slattery, Goldsmith, & Kalin, 2010; Grady, Karraker, & Metzger, 2012; Muris, van Brakel, Arntz, & Schouten, 2011). *Behavioral inhibition* refers to fear or wariness regarding novel people, objects, or situations (Egger & Angold, 2006; Kagan et al., 1988; Kagan, Snidman, Kahn, & Towsley, 2007). A high behavioral inhibition is found to be a risk factor for high levels of shyness and anxiety disorders (Chavira, Stein, & Malcarne, 2002; Karevold, Ystrø´´m, Coplan, Sanson, & Mathiesen, in press; Volbrecht & Goldsmith, 2010; Weems & Costa, 2005). In particular, the social component of behavioral inhibition (temperamental shyness) seems to refer to a negative expression of shyness or negative emotional reaction, characterized by avoidant behavior, gaze aversion, and vocal distress or hesitancy occurring during negative facial expressions of sadness or fear (Buss & Goldsmith, 2000).

It is interesting that Volbrecht and Goldsmith (2010) in conducting a longitudinal study on the predictors of shyness and anxiety during early childhood found no significant relation between shyness and anxiety symptoms; However, children's behavioral inhibition was a strong predictor of both shyness and anxiety symptoms. Likewise, it can be argued that only the negative component of shyness is related to anxiety symptoms. Indeed, Heiser et al. (2003) found, for example, that shy persons who met criteria for social anxiety disorder also had higher levels of introversion and neuroticism. The authors concluded that when shyness is experienced along with negative emotions, it becomes more strongly associated with anxiety. Unfortunately, so far no study has explored the relation between shyness expressed or experienced as a positive emotion and the level of anxiety.

## Positive Expression of Shyness From Infancy to Childhood

The positive expression of shyness has been documented during infancy and childhood (Colonnesi et al., 2013; Draghi-Lorenz, Reddy, & Costall, 2001; Greenberg & Marvin, 1982; Lewis, Stanger, Sullivan, & Barone, 1991; Reddy, 2005) and is perceived positively by other people because it is an indication of prosociality (Feinberg et al., 2012). The positive expression of shyness has a distinguishable expressive pattern (Izard & Hyson, 1986; Keltner & Buswell, 1997), of which the "coy smile" is a central feature (Colonnesi et al., 2012; Reddy, 2000). Its most basic form involves smiling with a simultaneous gaze and/or head aversion prior to the decline of the peak of the smile (Asendorpf, 1990). Nervous touching of the face and the body during or immediately after the smile has also been documented (Keltner & Anderson, 2000; Lewis, Sullivan, Stanger, & Weiss, 1989). Attempts to inhibit the smile (so-called *smile controls*, for example, lip-biting or hand-covering; Eibl-Eibesfeldt, 1989) have been described as part of adults' shyness displays both before and after the smile (Keltner & Buswell, 1997).

Reddy (2000) observed five young infants during their first 6 months of life displaying coy smiles in natural interactions with familiar and nonfamiliar persons. Coy smiles were coded as smiles with a gaze or a head aversion about 1.5–0.0 s before the apex. Similar results were found in a recent experimental study by Colonnesi et al. (2013) in which expressions of coy smiles were observed in 4-month-old infants when they were looking at themselves in a mirror, interacting with a familiar person in front of a mirror (mother and father), and interacting with a novel person in front of a mirror. Infants produced significantly more coy smiles during the interaction with the novel person than during the interaction with a familiar person or when they were only looking at

their own image in the mirror. This emotional expression was interpreted as the result of the feeling of ambivalence between the tendency to avoid and to approach a specific social situation.

When looking at the positive expression of shyness in toddlerhood, Greenberg and Marvin (1982) reported that strangers' attention elicited ambivalent reactions (wary and sociable behavior) in a majority of 3- and 4-year-olds. Lewis et al. (1991) compared the observed children's shy reactions in four different situations: looking at their reflection in a mirror, being overpraised by the experimenter, and being requested to dance for the mother and then for the experimenter. Children's shy reactions[1] were coded as a smile accompanied or followed by a gaze aversion and movement of the hands to touch hair, clothing, face, or other body parts (Geppert, 1986). At 2 years old, 52% of children ($n = 44$) displayed shyness at least once, while at 3 years old shy reactions were noted in 82% of the sample. At both ages, the situations provoking the most shyness were the mirror condition and the performance before the experimenter. Therefore, shyness in toddlers appears to be particularly evident during exposure to their self-reflection and to a novel person's attention. In a later study, DiBiase and Lewis (1997) examined the relation between positive expression of shyness and temperament. At the age of 13 months, no significant difference was found between children with difficult and with easy temperament in the expression of shyness.

In sum, the positive expression of shyness is an observable behavior in babies and young children and is elicited by social exposure to novel persons' attention, to self-reflection, and during a social performance. The positive expression of shyness has been, so far, investigated independently from the expression of shyness in a negative way (aversion without smile) and from children's behavioral inhibition. Previous research results suggest that the expression of shyness—in a positive or in a negative way—can be a facet of the child's personality with possible consequences in other domains of the social development.

## Positive Expression of Shyness as Emotion Regulation and Social Strategy

As empirical evidence suggests that children display shyness in the presence of a social audience, the regulatory role of this behavior may play an important function in children's social and emotional development. Kopp (1989) argued that approach–avoidance behaviors in social interaction with novel individuals serve to regulate distress, while Calkins, Gill, Johnson, and Smith (1999) suggested that approach behaviors with gaze aversion modulate enjoyment. Although accounts differ, most perspectives converge to suggest that the ambivalent characteristic of the positive expression of shyness could serve a regulatory function. Srofe and Waters (1976) posited that smiles develop in close relationship with psychophysiological mechanisms of arousal, attention, and tension release. Of these, the coy smile characteristic of the positive expression of shyness might serve, even as early as during infancy (Izard & Hyson, 1986; Reddy, 2000), to reduce arousal provoked by exposure to another's attention, while at the same time allowing the individual to continue engaging in the situation and to show interest in the interaction partner (Srofe & Waters, 1976). Similarly, Asendorpf (1990) argued that the fact that gaze aversion typically occurs during the most communicative part of the smile is an indication that the positive expression of shyness has a regulatory function, modulating the level of intimacy of the situation.

Along with this, emotional display and regulation serve important mediating roles in interpersonal relationships, promoting adaptive socioemotional development (Buss & Goldsmith, 1998; Calkins, 2007; Cole, Martin, & Dennis, 2004; Cole, Michel, & O'Donnell Teti, 1994; Gross & Thompson, 2007; Kopp, 1989). However, if the emotion regulation system is not sufficiently flexible to cope with moment-by-moment contextual demands, this could incur maladaptive consequences for adjustment (Bridges, Denham, & Ganiban, 2004; Cole et al., 2004). Indeed, emotion regulation deficiencies have been linked to academic, emotional, and behavioral difficulties during childhood (Weems & Pina, 2010) and with psychopathology during the life span (Amstadter, 2008; Calkins, 2007; Cole et al., 1994; Keltner & Kring, 1998). In addition, evidence suggests that maladaptive patterns of emotion regulation are likely to be involved in the etiology and maintenance of anxiety disorders (Amstadter, 2008; Weems & Pina, 2010; Zeman, Cassano, Perry-Parrish, & Stegall, 2006). For example, Suveg and Zeman (2004) found that 8- to 12-year-old children with anxiety disorders reported more difficulties in managing high levels of arousal and negative emotions such as worry and sadness. Thus, it seems plausible that children who exhibit early signs of anxiety might be less able to display shyness in a positive manner during social interactions.

Through this regulatory role, positive shyness appears to serve relevant adaptive social functions. A remarkable appeasement role has been attributed to the positive social function of embarrassment (Keltner & Anderson, 2000; Keltner, Young, & Buswell, 1997). Embarrassment displays are thought to increase interpersonal liking, and children who showed it received more affiliation and less punishment from parents (Keltner et al., 1997). Toddlers and preschoolers have been reported to use shyness as a social strategy to manipulate interactions with their caretaker (Marvin & Britner, 1999). In addition, coy smiles, by modulating arousal and simultaneously signaling well-being, may be crucial in developing reciprocity between the child and the caregiver in face-to-face interactions (Srofe & Waters, 1976). On the basis of what we have presented so far, the positive expression of shyness might be a reaction to a social situation, allowing the child to regulate arousal, evoke affiliative tendencies, extend positive interactions, elicit appeasement, and ultimately improve social experiences.

## The Present Study

The present study was designed to investigate whether the positive expression of shyness during early childhood should be

[1] It is important to note that the terms *shyness* and *embarrassment* have been often used as synonymous. In the study by Lewis et al. (1991), children's behavior was defined as "embarrassment" instead of shyness. Yet, in this study, Lewis et al. (1991) wrote that "the behaviors necessary to score embarrassment were a smiling facial expression followed by a gaze aversion and movement of the hands to touch hair, clothing, face, or other body parts. Such touching could accompany smiling/gaze avert, or follow it immediately" (pp. 487–488). The same emotional reaction has been defined as "shyness" by Darwin (1872), Asendorpf (1990), and Reddy (2000). In the present study, we adopted the term *expression of shyness* because what we investigated is more the expression of a specific aspect of the personality than as a negative self-conscious reaction to others' evaluation.

distinguished from the negative expression of shyness in relation to social competencies and social anxiety. We observed children's facial expressions of shyness during two experimental tasks. In the *performance task*, children had to give a performance together with the experimenter, who complimented them. In the second, *self-watching task*, children watched their performance together with a small audience who were not interacting with the children. In both tasks, children's positive and negative expressions of shyness were coded: Gaze, head, and body aversions during a smile were coded as *positive expressions of shyness*, and aversions without a smile were coded as *negative expressions of shyness*. We also coded children's positive facial expressions (i.e., smiles) as an index of their *positive reactions* (enjoyment without shyness), and children's negative facial expressions as *negative reactions* (withdrawals without aversion). Children's emotional reactions during the experimental task were related to specific social components of their temperament: *Shyness* and *sociability* (the short form of the Early Childhood Behavior Questionnaire [ECBQ]; Putnam, Gartstein, & Rothbart, 2006), and to their current level of anxiety (Preschool Anxiety Scale–Revised [PAS–R]; Spence et al., 2001).

We expected

*Hypothesis 1:* in both tasks (performance and self-watching), small positive relationships between *positive expressions of shyness* and *positive reactions* on the one hand and *negative expressions of shyness* and *negative reactions* on the other hand, since they share the same underlying emotion of ambivalence, but with a different emotional valence;

*Hypothesis 2:* the performance task to elicit more expression of *shyness* (both *positive* and *negative*) than the self-watching task, because of the tension release and interpersonal functions of shyness during social interactions;

*Hypothesis 3:* children's *positive expression of shyness* (but not *positive* and *negative reactions*, or *negative shyness*) to be inversely related to their temperamental level of shyness and positively related to their temperamental level of sociability; and

*Hypothesis 4:* children's anxiety levels, as reported by both the parents, to be positively related to negative reactions and the negative expression of shyness and to be inversely related to their positive expression of shyness.

Evidence for Hypotheses 1 and 2 would support the role of the positive expression of shyness as a capacity to regulate arousal and inhibit fear during social performance and exposure and to display prosociality in contrast to negative shyness. Evidence for Hypotheses 3 and 4 would indicate the importance of differentiating between negative and positive displays of shyness in relation to anxiety. Furthermore, it would suggest that the positive expression of shyness may be dysregulated in children with high levels of anxiety.

## Method

### Participants

Participants were part of a longitudinal study at the University of Amsterdam on the antecedents of social anxiety in young children. One hundred and two first-born children ($M_{age}$ = 29.70 months, $SD$ = 0.71, age range = 28–32 months) participated in the study (46 boys, 56 girls). The observations were conducted during a 2-hr visit with the mother at the laboratory of the University of Amsterdam. Families were recruited from in and around the city of Amsterdam during the pregnancy of the first child through leaflets supplied by midwives, at pregnancy courses, at baby shops, and through advertisements in magazines and obstetricians' offices. All parents could speak fluent Dutch or English. Parents were from the middle and upper classes, and their educational level (on a scale ranging from 1, *primary education*, to 8: *university*) was fairly high ($M_{mother}$ = 7.01, $SD$ = 1.18; $M_{father}$ = 6.56, $SD$ = 1.60). Children were excluded from the study if they had an Apgar score of less than 8, birth weight of less than 2,500 grams, or any neurological conditions.

### Setting and Procedure

The observations took place in an experimental room with three remotely controlled cameras, with which we obtained close-up shots of children's face and upper body. The experiment consisted of two tasks, a *performance* and a *self-watching* task. Figure 1 shows the setting of both tasks. A cabinet with a television behind a one-way mirror (40 × 60 × 30 cm), placed 50 cm above the

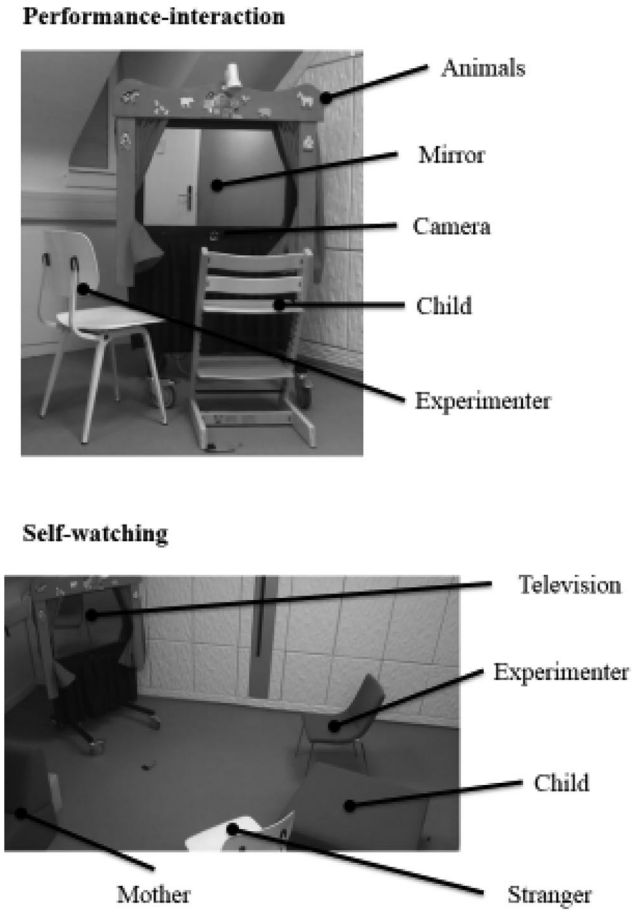


*Figure 1.* Setting for the experimental procedure.

floor, was used as a mirror in the performance task and as a television in the self-watching task. On the mirror frame were wooden images of animals. A hidden video camera was placed at the bottom of the frame to record the performance that was shown later to the child. Both tasks had a maximum duration of 180 s.

In the performance task, children were exposed to an emotionally intense social situation, in which they were asked to give a performance. Children were exposed to positive attention and compliments. At the beginning of the performance task, the mirror was covered by a curtain until the researcher removed it and the task started. The child was invited to leave the mother and to sit on a wooden stool in front of the mirror with the experimenter, who sat beside the child, out of view of the mirror. The mother was asked to sit on a couch 3 m to the side of the mirror. Only if the child refused to sit without the mother was the mother invited to take a seat beside the mirror. The experimenter pointed in turn at each animal and asked the child what its name was and if he or she could imitate the noise the animal made. If the child reproduced the noise of the animal, the experimenter gave compliments and invited the child to repeat the noise more loudly. If the child did not respond, the experimenter made the noise and prompted the child to repeat it. The task ended when all the animals had been named and imitated. The experimenter prompted the child to look at the reflected image on the mirror throughout the task.

In the self-watching task, which started immediately afterward, children were invited to watch their performance with a small audience who did not make comments. A confederate (the "stranger" to the child) entered the room and was invited by the experimenter to "watch the game they had been playing." The child was seated on a couch facing the television cabinet, with the stranger, the experimenter, and the mother on either side (see Figure 1). The video recording from the previous task was played for 2 min.[2] Three children refused to watch their own performance; therefore, only the performance task of these children was coded and used for the analyses.

Within 1 week of the laboratory visit, both parents were asked to complete two questionnaires: the Dutch version of the ECBQ–Short Form (Putnam et al., 2006), and the PAS–R (Broeren & Muris, 2008; Edwards et al., 2010; Spence et al., 2001).

## Coding of Children's Emotional Expressions

The coding for the performance task started as soon as the child was seated in front of the mirror and the reflection became visible. It lasted until the child was asked to stand up from the stool and move away from the mirror. The mean duration in seconds of the performance task was 161.25 ($SD$ = 69.72). The coding for the self-watching task started as soon as the child sat on the couch and began watching the video with the stranger. The observation ended before the stranger complimented the child with the performance. The mean duration in seconds of this task was 139.94 ($SD$ = 30.92).

The coding system was developed on the basis of research by Asendorpf (1990); Bolzani Dinhart et al. (2005); Colonnesi et al. (2013); Ekman and Friesen (1978); Lewis (1995), and Reddy (2000, 2001). The Observer XT 10.0 event-logging software (Noldus, Trienes, Hendriksen, Jansen, & Jansen, 2000) was used to code the video observations ($N$ = 201). Using this program, children's behaviors were coded as state or point events. A *state event* has a clear start and end, while a *point event* does not have a specific duration. Table 1 reports the list of coded behaviors and their descriptions. The coding system was first tested on pilot data ($n$ = five children, 10 observations). The observations were coded by five independent observers who underwent a training protocol under the direction of the first author. Coders were first trained on a simplified set of behaviors to familiarize them with the coding interface of the Observer XT.

Next, four target behaviors were obtained combining the state and the point events through nesting and lag-sequential analyses: positive and negative reactions, and positive and negative expressions of shyness. The main difference between reactions (positive and negative) and shyness (positive and negative) was the gaze or head aversion, present in shyness but not in other reactions. Table 1 provides descriptive and reliability statistics of the four target behaviors. Interrater reliability was calculated on 10 children (10 performance and 10 self-watching observations), and expressed as a percentage agreement and with Cohen's kappa.

## Validation of Positive and Negative Shyness

Since the present study was the first study in which the positive and negative expression of shyness in toddlers was defined and compared, we aimed to further validate our coding system by comparing the coded emotional expression of expert coders with the attribution of naïve, inexperienced coders. Fifty-five master students (50 females) of the master's program in orthopedagogy evaluated children's emotional expressions in nine short video clips lasting 9 s each. Children's emotional reactions in three video clips had been previously coded by trained observers as positive shyness; in two other video clips, their emotional reactions had been coded as negative shyness; and in four video clips, their emotional reactions had been coded as not indicating shyness (two of these video clips presented a positive reaction, one video clip presented a negative reaction, and one video clip presented a neutral reaction). The inexperienced coders were asked to code children's reactions in one of the following mutually exclusive categories: (a) non-shy reaction, (b) a shy reaction expressed in a positive way, and (c) a shy reaction expressed in a negative way. Table 2 shows the order of presentation of the video clips and the percentages of answers of the coders.

Children's non-shy expressions were coded appropriately, on average, by 70% of the coders as not shy. Some coders interpreted the absence of shyness as negative shyness, in particular, when a neutral or a negative facial expression was shown or as positive shyness when a smile was present (on average 10.1%). Sixty-eight percent of the coders coded children's positive shyness in the same way the expert coders did, yet 25% of the coders defined this behavior as not shy. No coders coded positive shyness as a negative shyness reaction. About 80.5% of the coders attributed the same emotional reaction as the expert coders in the case of negative shyness, with a small percentage choosing positive shyness and no shyness. In sum, the agreement between the inexperienced coders and the expert coders was fairly high, indicating

[2] The self-watching task ended when the stranger complimented the child on his or her performance ("You can imitate animals well!"; "How clever of you!"; "Good job imitating the [name of animal]!"), said goodbye, and left the room. This episode was not coded.

Table 1
*Coded Behaviors With Type, Description, and Target Variables With Reliability Values (Percentages and Cohen's kappa)*

| Variable | Event type | Description | Reliability % (kappa) |
|---|---|---|---|
| Coded behavior | | | |
| Positive facial expression | State | Closed and open smiles identified by raising corners of the lips, constriction of the eyes, raising of the cheeks, and opening of the mouth. | |
| Negative facial expression | State | Frowns and sad and crying faces identified by lowering of the brows, constriction of the eyes, and opening of the mouth. | |
| Apex | Point | The phase of the smile when the corners of the mouth are maximally extended upwards. | |
| Gaze aversion | Point | Moving the gaze of the eyes away from the interaction point. | |
| Head aversion | Point | Turning the head away from the interaction point. | |
| Body aversion | Point | Turning the body away from the interaction point. | |
| Target behavior | | | |
| Positive reaction | | No. of positive facial expressions (smiles) without any gaze or head aversion | 82 (.62) |
| Positive shyness | | No. of positive facial expressions in which an aversion (gaze, head, or both) occurred within 1.5–0.0 s prior to the apex of the smile. Children's body aversion during a coy smile was also considered. | 95 (.66) |
| Negative reaction | | No. of negative facial expressions without any gaze or head aversion. | 97 (.80) |
| Negative shyness | | No. of negative facial expressions in which an aversion (gaze, head, or both) occurred during the duration of the expression (nested by). Children's body aversion during an episode of negative shyness was also considered | 83 (.72) |



that the behaviors coded using a microgenetic coding system were perceived in the same way by untrained adults.

## Children's Behavioral Inhibition and Trait Shyness

In order to assess children's social aspect of behavioral inhibition, we asked both parents to complete the five–item Shyness scale (slow or inhibited approach and/or discomfort in social situations involving novelty or uncertainty) and the four-item Sociability scale (seeking and taking pleasure in interactions with others) of the Dutch version of the ECBQ–Short Form (Putnam et al., 2006). The ECBQ assesses temperament in children from 3 to 8 years old. Mothers and fathers reported on the behavior of their child in the previous 6 months. The items were answered on a 7-point Likert scale (1 = *extremely untrue*, 7 = *extremely true*). Internal consistency reliabilities (with 30-month-old children) in the validation study (Putman et al., 2006) were .85 for both the Shyness and Sociability scales.

Table 2
*Percentages (and Number) of Raters Who Coded Children's Emotional Reactions to the Nine Video Clips as No Shyness, Positive Shyness, or Negative Shyness*

| | Percentages (and no.) of raters | | |
|---|---|---|---|
| Video clip (order) | No shyness | Positive shyness | Negative shyness |
| Positive reaction (5) | 70.9 (39) | 25.4 (14) | 00.0 (00) |
| Positive reaction (6) | 96.4 (53) | 00.0 (00) | 00.0 (00) |
| Negative reaction (1) | 69.1 (38) | 14.5 (08) | 16.4 (09) |
| Positive shyness (2) | 41.8 (23) | 63.6 (35) | 00.0 (00) |
| Positive shyness (7) | 00.0 (00) | 98.2 (54) | 00.0 (00) |
| Positive shyness (9) | 38.2 (21) | 58.2 (32) | 07.3 (04) |
| Negative shyness (3) | 01.8 (01) | 12.7 (07) | 83.6 (46) |
| Negative shyness (4) | 12.7 (07) | 09.1 (05) | 78.2 (43) |
| Negative shyness (8) | 03.6 (02) | 07.3 (04) | 89.1 (49) |

## Children's Level of Anxiety Reported by the Parents

Both parents were asked to fill in the Dutch version of the PAS–R (Broeren & Muris, 2008; Edwards et al., 2010; Spence et al., 2001). The questionnaire assesses a wide range of anxieties and fears in very young children and consists of 28 items rated from 0 (*not at all true*) to 4 (*very often true*). Of these, seven items assess social anxiety (e.g., "Acts shy and quiet around new people"); seven items assess generalized anxiety (e.g., "Seems nervous in new or unusual situations"); five items measure separation anxiety (e.g., "Becomes distressed when separated from parents"); and nine items measure specific phobias (e.g., "Is afraid of loud noises"). The questionnaire has good construct validity and reliability (Broeren & Muris, 2008; Edwards et al., 2010).

## Statistical Approach

Data were assessed for skewness and kurtosis (George & Mallery, 2001). For most of the criterion variables, the assumption of normality was violated, showing skewed distributions. Therefore, data were analyzed using parametric statistics when the assumption of normality was not violated and nonparametric statistical analyses such as Mann–Whitney U tests, Wilcoxon matched-pair tests ($W_s$), and Spearman correlations when the assumption was violated. Effect sizes were reported for the analyses testing the main hypotheses as Cohen's $d$ ($\pm 0.20$ = small; $\pm 0.50$ = moderate; $\pm 0.80$ = large) and Spearman correlations ($\pm .10$ = small; $\pm .30$ = moderate; $\pm .50$ = large). In order to test the predictive value of expressions of shyness and temperament on children's level of anxiety, we conducted multiple linear regression analyses with log-transformed scores of the four emotional expressions (Field, 2005).

## Results

### Production of Positive and Negative Reactions and Shyness in the Performance and Self-Watching Tasks

Control analyses, conducted in order to explore the effect of children's gender and age on children's expression of positive and negative reactions and shyness, revealed no significant differences. Therefore these variables were not included in the following analyses.

In the performance task, 81 children agreed to sit alone in front of the mirror with the experimenter, while 21 children reacted with anxiety and agreed to sit in front of the mirror only on the mother's lap or by her side. Mann–Whitney U tests showed that children who would not do the task without the mother displayed significantly less positive reactions, $z = -3.93$, $p < .05$ (with mother $M = 3.90$, $SD = 3.72$, average rank = 28.95; without mother $M = 8.19$, $SD = 4.19$, average rank = 57.35) and less positive shyness, $z = -3.26$, $p < .01$ (with mother $M = 0.81$, $SD = 1.17$, average rank = 33.14; without mother $M = 2.92$, $SD = 3.27$, average rank = 56.26). These children also displayed more negative reactions, $z = 2.44$, $p < .05$ (with mother $M = 1.67$, $SD = 2.08$, average rank = 63.86; without mother $M = 0.75$, $SD = 1.54$, average rank = 48.30). No significant difference between the conditions with or without the mother present was found for children's negative expression of shyness, $z = –1.02$, $p = ns$ (with mother $M = 1.47$, $SD = 3.11$; average rank = 48.00; without mother $M = 0.47$, $SD = 1.16$, average rank = 50.51). In sum, children who reacted with anxiety and agreed to sit in front of the mirror only when close to their mother displayed fewer smiles and positive shyness, and more discomfort, compared to children who agreed to sit alone.

Table 3 reports descriptive statistics for children's positive and negative reactions and for positive and negative expressions of shyness in the performance and self-watching task and the intra-individual correlations between the two tasks (intrabehavioral stability).

The first aim (Hypothesis 1) of the present study was to explore the extent to which the positive display of shyness differed from the negative display of shyness and negative reactions in the two tasks. Positive and negative shyness were significantly negatively correlated in the first task (performance: $r = –.28$, $p < .05$; self-watching: $r = –.18$, $p = .08$). Similarly, positive shyness and negative reactions were negatively correlated in the first task (performance: $r = –.31$, $p < .01$; self-watching: $r = –.02$, $p = .86$). On the other hand, positive reactions and positive shyness were positively correlated in both tasks (performance: Spearman's $r = .41$, $p < .001$); self-watching: $r = .43$, $p < .001$), as were negative reactions and negative shyness (performance: $r = .81$, $p < .001$; self-watching: $r = .53$, $p < .001$). In sum, moderate negative correlations were found between children's expressions of positive and negative reactions and shyness only in the performance task. In contrast, positive moderate-to-high correlations were found between the positive expression of shyness and positive reactions and between negative shyness and negative reactions in both tasks.

The second aim (Hypothesis 2) of the present study was to explore in which situation children displayed shy emotions, with positive and negative connotations. As shown in Table 3, children produced more emotional displays in the performance than the self-watching task (positive reactions: $W_s = 403.00$, $p < .001$,

Table 3
*Total Number of Emotional Reactions Expressed by All Children, Number of Children Who Displayed the Emotional Reaction, and Means (and Standard Deviations) of Frequencies (f) and Proportions (p), and Intersituation Correlations for the Main Emotional Reactions*

| | Performance task | | | | Self-watching task | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Emotional reactions | Total no. of reactions by all children[a] | (No. of children displaying) | *M* (*SD*) *f* | *M* (*SD*) *p* | Total no. of reactions by all children[a] | (No. of children displaying) | *M* (*SD*) *f* | *M* (*SD*) *p* | *r*[b] |
| Positive reactions | 745 | (97) | 7.30 (4.43) | .65 (.26) | 410 | (83) | 4.14 (3.64) | .72 (.36) | .54** |
| Negative reactions | 96 | (41) | 0.94 (1.70) | .10 (.18) | 16 | (13) | 0.16 (0.45) | .06 (.21) | .40** |
| Positive shyness | 244 | (74) | 2.49 (3.08) | .18 (.17) | 71 | (35) | 0.72 (1.28) | .10 (.16) | .23* |
| GA | 73 | (38) | | | 18 | (13) | | | |
| HA | 54 | (36) | | | 19 | (16) | | | |
| GA + HA | 90 | (37) | | | 24 | (15) | | | |
| GA + BA | 8 | (8) | | | 0 | (0) | | | |
| HA + BA | 13 | (11) | | | 3 | (3) | | | |
| GA + BA + HA | 16 | (12) | | | 7 | (7) | | | |
| Negative shyness | 66 | (28) | 0.68 (1.78) | .06 (.13) | 9 | (4) | 0.09 (0.45) | .01 (.07) | .24* |
| GA | 15 | (9) | | | 1 | (1) | | | |
| HA | 17 | (12) | | | 7 | (4) | | | |
| GA + HA | 15 | (12) | | | 0 | (0) | | | |
| GA + BA | 1 | (1) | | | 0 | (0) | | | |
| HA + BA | 2 | (2) | | | 0 | (0) | | | |
| GA + BA + HA | 19 | (6) | | | 1 | (1) | | | |
| Total | | | 11.91 (5.45) | | | | 5.11 (4.39) | | |

*Note*. GA = gaze aversion; HA = head aversion; BA = body aversion.
[a] Three children were excluded. [b] Intertask correlations.
* $p < .05$. ** $p < .01$.

effect size [ES] = 0.78; positive shyness: $W_s = 367.00$, $p < .001$, ES = 0.75; negative reactions: $W_s = 21.00$, $p < .001$, ES = 0.63; negative shyness, $W_s = 25.00$, $p < .001$, ES = 0.45). Because the performance task induced, on average, more emotional expressions than the self-watching task, $t(98) = 10.31$, $p < .001$, ES = 1.37, children's proportions of emotional expressions in the two tasks were compared. In the performance task, children produced more positive shyness ($W_s = 650.00$, $p < .001$, ES = 0.48), negative shyness ($W_s = 216.00$, $p < .01$, ES = 0.48), and negative reactions ($W_s = 31.00$, $p < .001$, ES = 0.20). On the other hand, the proportion of positive reactions was higher in the self-watching task ($W_s = 2{,}585.50$, $p < .01$, ES = −0.22). In sum, the performance task elicited more positive shyness as well as more negative reactions and negative shyness than the self-watching task while during the self-watching task, an average of 72% of children's reactions were positive (without shyness).

## Relation Between the Expression of Emotions, Temperamental Shyness and Sociability, and Anxiety

Data from the ECBQ and the PAS–R of 98 children were available, since four families (both mothers and fathers) did not fill in the questionnaires. These four families were excluded from the following analyses. One child (1%) only had a father report, and nine children (9%) only had a mother report. The estimation-maximization procedure (Graham, 2009) was used in order to correct the data for missing values. The Little's missing completely at random (MCAR) test was computed to evaluate whether the missing data in each subscale were random or systematic. No significant chi-squares were found for the two ECBQ scales Shyness and Sociability. For the PAS–R, a significant chi-square was found only for the subscale Specific Phobias, $\chi^2(38) = 67.67$, $p < .005$, showing that parents systematically did not answer specific items (e.g., "My child is afraid to go to the dentist" as children were too young to go to the dentist).

Table 4 shows means, standard deviations, and Cronbach's alpha coefficients for each subscale, and mother–father correlations for both the ECBQ and the PAS–R. Children's scores in the subscales were comparable to those reported by Putnam et al. (2006) for the ECBQ and by Edwards et al. (2010) and by Broeren and Muris (2008) for the PAS–R in nonclinical populations of the same age. Internal consistencies ranged from low (ECBQ Sociability: α = .57) to excellent (PAS–R total: α = .91). No effect of gender, age, or parental socioeconomic status was found on all the subscales of the ECBQ and PAS–R or on the total score of the PAS–R. Since mean scores of mother and father for each scale were significantly positively correlated, mean mother–father scores were used for further analyses.

Table 4
*Descriptives and Cronbach's Alpha Coefficients for the Shyness and Sociability Scales of the Early Childhood Behavior Questionnaire and for the Subscales and Total Scores of Preschool Anxiety Scale–Revised, and Correlations Between Mothers and Fathers*

| Variable | Mother | | Father | | |
|---|---|---|---|---|---|
| | *M* (*SD*) | α | *M* (*SD*) | α | *r* |
| Early Childhood Behavior Questionnaire | | | | | |
| Shyness | 3.52 (1.23) | .77 | 3.67 (1.10) | .72 | .45** |
| Sociability | 6.15 (0.79) | .57 | 5.87 (0.82) | .60 | .29** |
| Preschool Anxiety Scale–Revised | | | | | |
| Social | 5.49 (4.53) | .86 | 5.70 (4.00) | .85 | .39** |
| Generalized | 4.53 (3.56) | .79 | 4.91 (3.86) | .82 | .28** |
| Separation | 2.64 (2.43) | .75 | 3.30 (2.59) | .71 | .40** |
| Specific Phobia | 7.44 (4.59) | .68 | 7.35 (4.71) | .73 | .44** |
| Total score | 20.10 (12.11) | .91 | 21.56 (12.41) | .91 | .36** |

** $p < .01$.

Preliminary analyses were conducted in order to examine the relation between children's level of anxiety as reported by the parents and their anxious reaction during the experimental session (unwillingness to sit alone in front to the mirror). Mann–Whitney U tests were conducted comparing the group of children performing with and without the mother. No significant differences were found between the two groups on the ECBQ scales Shyness and Sociability, or on the subscales or the total score of the PAS–R.

## Association Between Expression of Emotions and Temperament

The third aim (Hypothesis 3) of the present study was to compare children's positive and negative reactions and shyness during the experimental tasks to their temperamental level of shyness and sociability. Only data from the performance task were used since this situation proved to actively enhance their positive and negative expressions of shyness. Table 5 shows the correlation between children's positive and negative reactions and expression of shyness and their temperamental level of shyness and sociability. No significant correlations were found between children's emotional reactions during the experimental task and their temperamental level of shyness. In contrast, the positive expression of shyness (but not positive reactions) was positively related to sociability, while children's negative reactions and negative shyness were both negatively related to sociability.

## Association Between Expression of Emotions and Anxiety

Next, we tested Hypothesis 4 on the relations between children's positive and negative reactions and shyness during the performance task and their levels of anxiety as reported by the parents (see Table 5). Children's positive reactions and shyness were both negatively related to their total anxiety, while negative reactions (but not negative shyness) were positively related to total anxiety. Children's positive expression of shyness was negatively correlated to parent-reported levels on the subscales Social Anxiety, Generalized Anxiety, and Separation Anxiety, but not to Specific Phobias. Positive reactions were negatively correlated only with Separation Anxiety. Significant positive correlations were found between negative reactions and children's levels of social anxiety and generalized anxiety. No significant correlations were found between negative shyness and any subtype of anxiety. In sum, a consistent negative relation was found between the positive expression of shyness and level of anxiety, as well as a consistent positive relation between negative reactions and level of anxiety.

Table 5
*Correlations Between Children's Emotional Reactions During the Performance Task and Children's Temperamental Level of Shyness and Sociability (ECBQ) and Levels of Anxiety as Reported by Both Parents Averaged (PAS–R)*

| | ECBQ | | PAS–R | | | | |
|---|---|---|---|---|---|---|---|
| | Shyness | Sociability | Social anxiety | Generalized anxiety | Separation anxiety | Specific phobias | Total anxiety |
| Positive reactions | .02 | .17 | −.15 | −.12 | −.24* | −.18 | −.22* |
| Positive shyness | .02 | .22* | −.21* | −.32** | −.23* | −.15 | −.27* |
| Negative reactions | .16 | −.33** | .26* | .22* | .11 | .12 | .21* |
| Negative shyness | .07 | −.24* | .10 | .16 | .06 | .08 | .10 |
| Shyness (ECBQ) | — | — | .63** | .35** | .26* | .32** | .49** |
| Sociability (ECBQ) | — | — | −.47** | −.34** | −.36** | −.28** | −.44** |

*Note*. ECBQ = Early Childhood Behavior Questionnaire (short form); PAS–R = Preschool Anxiety Scale–Revised.
* $p < .05$. ** $p < .01$.

Children's level of anxiety as reported by the parents in the PAS–R (all subscales and the total score) was positively related to the children's temperamental level of shyness and negatively related to children's temperamental level of sociability as reported by the parents in the ECBQ.

## Expression of Emotions and Temperament as Predictors of Anxiety

Last, multiple linear regressions (MLR) were performed in order to test the independent predictive value of children's emotional expressions on social, generalized, separation, and total anxiety, taking into account children's temperamental shyness and sociability. Results of the MLR are presented in Table 6. The predictors explained 37% of the variance in total anxiety, 42% in social anxiety, and 19% of the variance in both generalized and separation anxiety. The three types of anxiety and total anxiety were significantly predicted by temperamental shyness and negatively predicted by sociability. For the emotional expressions, only children's positive expression of shyness was a significant negative predictor of total anxiety and of generalized anxiety. That is, children who displayed more positive shyness and who had a higher level of sociability and a low level of shyness presented a lower level of anxiety, and in particular generalized anxiety.

## Discussion

Shyness has traditionally been viewed as a "negative" emotional state and personality trait that induces withdrawal from social experience, especially during childhood (Buss, 1980; Lewis, 2001) and as a form or predictor of social anxiety (Henderson & Zimbardo, 1998; Rapee, 1998). In contrast, the results of the present study provide evidence that shyness in toddlerhood is a heterogeneous emotional state, which can be expressed in a negative as well as in a positive way and may have different consequences for the person and the environment. In our study, children's negative reactions and negative expression of shyness were associated with higher anxiety levels and lower sociability as reported by both parents about the child. On the other hand, shyness expressed in a positive way, through the coy smile, was associated with fewer withdrawals from the interaction, lower parent-reported anxiety levels, and higher sociability. These results are only partially in line with canonical literature on shyness, and they provide a new way to look at the expression of shyness during childhood.

## The Expression of Positive Shyness

As expected, we found a moderate negative relation between the positive and the negative expressions of shyness and between the positive expressions of shyness and the more general negative reactions. Although both positive and negative shyness are characterized by a feeling of ambivalence toward a specific social situation, positive shyness is an alternative reaction to withdrawal and other negative anxious reactions. This difference between the positive and negative expressions of shyness suggests that shyness investigated in previous studies could be a combination of negative and more positive components of the same emotion (e.g., DiBiase & Lewis, 1997; Lewis et al., 1991).

Table 6
*Multiple Regression Analyses With Social Anxiety, Generalized Anxiety, Separation Anxiety, and Total Anxiety as Dependent Variables and Temperament (ECBQ) and Children's Emotional Expressions as Predictors*

| | Social anxiety | | | | Generalized anxiety | | | | Separation anxiety | | | | Total anxiety | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | $R^2$ | $F$ | β | $t$ | $R^2$ | $F$ | β | $t$ | $R^2$ | $F$ | β | $t$ | $R^2$ | $F$ | β | $t$ |
| Model | .46 | 12.90*** | | | .24 | 4.79*** | | | .24 | 4.82*** | | | .41* | 10.45*** | | |
| Shyness (ECBQ) | | | .53 | 6.37*** | | | .28 | 2.81** | | | .23 | 2.34* | | | .42 | 4.88*** |
| Sociability (ECBQ) | | | −.26 | −3.13** | | | −.19 | −1.91* | | | −.30 | −3.04** | | | −.30 | −3.39** |
| Positive reaction | | | −.01 | −0.13 | | | .01 | 0.63 | | | −.18 | −1.67 | | | −.08 | −0.82 |
| Negative reaction | | | .06 | −0.41 | | | −.08 | −0.48 | | | −.09 | −0.55 | | | −.04 | −0.24 |
| Positive shyness | | | −.11 | −1.24 | | | −.30 | −2.87* | | | −.10 | −0.90 | | | −.19 | −2.01* |
| Negative shyness | | | −.05 | −0.36 | | | .11 | 0.71 | | | .01 | 0.05 | | | .03 | 0.21 |

*Note*. ECBQ = Early Childhood Behavior Questionnaire (short form).
* $p < .05$. ** $p < .01$. *** $p < .001$.

We found that shyness can be displayed in a negative or in a positive way, yet the question remains as to what the functional features of positive shyness may be. Interestingly, Leary, Britt, Cutlip, and Templeton (1992) reported three possible explanations for adults' embarrassment expressed through a smile (or silly grin). First, smiling people can cover their feeling of social discomfort (Edelmann, 1987). The second explanation is that the smile is a way to acknowledge that one has behaved inappropriately or in a silly way (Asendorpf, 1990). The third explanation is that the smile can be related to the submissive facial expression displayed by other primates in threatening situations (Goodall, 1988; Jolly, 1985). All three explanations converge to describe embarrassment expressed through a smile as an adaptive and effective behavior to cope with emotionally negative social situations (discomfort, humiliation, or submission). However, our results provide some evidence for the positive expression of shyness as a response to positive social attention that may evoke feelings of modesty, gratitude, or awareness of one's own success.

Positive shyness explored in the present study can be compared with the expression of shyness across diverse cultures. For example, Xu, Farver, Chang, Zhang, and Yu (2007) reported two forms of shyness in Chinese children: an *anxious shyness*, similar to the Western view of shyness, and a so-called *regulated shyness*, characterized by a modest and unassuming behavior in order to enhance social harmony and maintain harmony in the social group. Anxious shyness, but not regulated shyness, was related to less acceptance by peers and more psychosocial difficulties such as loneliness and social fear. Similarly, shyness and embarrassment are more positively valued in Indian (Keltner & Anderson, 2000) and Chinese (Chen, Rubin, & Li, 1995) cultures compared with Western cultures. These results support the idea that positive shyness and its function are present, and more positive and consciously evaluated, in non-Western cultures. In the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013), more attention is paid to culturally different expressions of social anxiety and social anxiety disorder (Hofmann, Asnaani, & Hinton, 2010). The concept and study of positive expressions of shyness across cultures may promote further understanding of functional and dysfunctional forms of social anxiety and shyness.

## The Expression of Shyness During the Performance and Self-Watching Tasks

In the present study, children expressed in absolute and proportional ways more positive shyness and negative shyness and reactions during the interaction with a novel person, who was giving attention and compliments, than they did watching their own performance in the presence of two novel persons and the mother. Performance tasks are found to induce greater anxiety than self-watching tasks (Hofmann, Moscovitch, & Kim, 2006), which can explain children's expressions of negative reactions and negative shyness. However, some other children coped with the performance situation displaying more positive shyness. This supports the hypothesis that the positive expression of shyness may modulate arousal and inhibit fear during an emotionally intense social situation (Amstadter, 2008; Asendorpf, 1990; Leary et al., 1992; Srofe & Waters, 1976). In order to further investigate the regulatory function of positive shyness, future research should explore whether children's physiological reactions, such as heart rate and, particularly, blushing, vary during and after the positive expression of shyness compared with the negative expression of shyness (de Vente, Majdandžić, & Bögels, in press).

The presence of more expressions of shyness during a performance is also in line with the hypothesis of the social function of positive shyness as an adaptive way to express ambivalence and to maintain engagement (Izard & Hyson, 1986; Keltner & Anderson, 2000; Keltner & Buswell, 1997; Lewis, 2001; Reddy, 2001, 2005). According to this idea, the functional role that the positive expression of shyness plays in successful social adaptation is different from that of the negative expression of shyness. These results also confirm those of previous investigations on children's positive expression of shyness during infancy (Colonnesi et al., 2013; Reddy, 2000). Indeed, rather than being a hindrance to social experience, positive shyness promotes affiliation and appeasement (Feinberg et al., 2012; Keltner & Anderson, 2000). In addition, the combination of affiliative and avoidant tendencies typical of positive shyness appears to enable the child to conciliate exploration of the surroundings with avoidance of possible dangers (Bronson, 1972; Srofe & Waters, 1976). This is advantageous in that it can scaffold the child's experience in new environments. Therefore, by facilitating social interactions and attitudes regarding social situations, the positive expression of shyness can promote the child's sociocognitive competence (Colonnesi et al., 2013; Izard & Hyson, 1986). Besides, children's positive expression of shyness can be a way to regulate approach and prevent impulsive behaviors during social situations. For example, positive shyness could have the implicit function of communicating the intention to approach and of maintaining distance with novel persons. Along this line, a positive relation should be expected between the ability to express positive shyness and the individual development of social understanding (Carpendale & Lewis, 2004).

## Relation Between the Positive and Negative Expression of Shyness and Early Levels of Anxiety

Our finding that negative reactions during an interactive social situation was related to higher anxiety and lower sociability is in line with previous findings on the relation between shyness and anxiety (Henderson & Zimbardo, 1998; Marshall & Lipsett, 1994; Rapee, 1998) and with studies that showed a positive relation between behavioral inhibition and anxiety (Egger & Angold, 2006; Kagan et al., 1988; Rapee et al., 2009). However, and in contrast with previous literature, we found children's positive expression of shyness to be *positively* related to their sociability level and *negatively* related to their anxiety levels, in particular to generalized anxiety.

The opposite relation between positive shyness on the one hand and anxiety level, sociability level, and negative shyness on the other hand can explain why the prevalence of shyness is higher than the prevalence of social anxiety (Bernstein, Borchardt, & Perwien, 1996; Carducci & Zimbardo, 1995; Henderson & Zimbardo, 1998; Rapee et al., 2009). It could be argued that shyness expressed with a negative connotation is a reflection of fear and discomfort during social situations. In contrast, shyness expressed with a positive connotation may represent the combination of fear/discomfort and pleasure/sociability during social situations. In this way, positive shyness could serve the adaptive function of

regulating the emotion of fear through the smile accompanied by head or gaze aversion (Colonnesi et al., 2013; Izard & Hyson, 1986; Kopp, 1989; Srofe & Waters, 1976). The regulation of fear is found to be one of the most important regulation strategies used to prevent anxiety disorder (Amstadter, 2008).

Multivariate analyses showed that a higher level of anxiety, and in particular generalized anxiety, can be predicted by a less frequent positive expression of shyness, a higher level of temperamental shyness, and a lower level of temperamental sociability. In other words, displaying the positive expression of shyness less frequently in children who are temperamentally shy and less sociable could deprive them of considerable advantages in terms of social functioning and might be involved in the development of an anxiety disorder. This hypothesis would be in line with the proposal that positive emotion dysregulation might be involved in the course of anxiety disorders (Hannesdottir & Ollendick, 2007; Kashdan & Breen, 2008; Zeman et al., 2006) and that an anxiety disorder might result from the interplay between behavioral inhibition and emotional dysregulation (Rapee & Coplan, 2010). Thus, investigating the expression of important social emotions such as positive shyness in a clinical group of children with (social) anxiety disorder could be useful in facilitating understanding of the role of emotion regulation in the etiology and development of anxiety disorders.

In our study, the positive display of shyness was most negatively correlated with the level of generalized anxiety symptoms. A possible explanation is that generalized anxiety reflects a higher order trait that underlies other anxiety constructs in toddlerhood. Yet, in the development of the original PAS scale, Spence et al. (2001) found that symptoms of generalized anxiety and separation anxiety could not be clustered into different factors. In the revised version of the PAS (Edwards et al., 2010), used in the current study, the items belonging to each anxiety subtype were better defined, and different factors for generalized anxiety and separation anxiety emerged. However, generalized anxiety was still found to load more than any other anxiety subtype on a higher order anxiety factor. Indeed, children suffering from generalized anxiety disorder alone are relatively rare, compared with those with comorbid conditions (Bögels, Snieder, & Kindt, 2003). Therefore, the fact that the positive expression of shyness was more strongly associated with generalized anxiety than with any other anxiety subscale could be due to generalized anxiety symptoms encompassing all others.

Children's negative reactions and negative expressions of shyness were highly correlated ($r = .80$). This result is consistent with the fact that both negative reactions and negative shyness are included in the criteria of behavioral inhibition (Goldsmith, Reilly, Lemery, Longley, & Prescott, 1999). Yet, only children's negative reactions and not negative shyness proved to be significantly related to children's levels of anxiety. Possibly, children's wariness and facial expressions of fear and discomfort were, in the present study, more sensitive predictors of anxiety levels than the production of (gaze or head) aversions during the expression of the same emotions (i.e., negative shyness). The distinction between negative reactions and negative expression of shyness needs to be further investigated, also using more neutral or ambiguous social situations in order to further define the construct of the negative expression of shyness.

## Limitations and Future Research

The present study has some limitations. First, the relation between children's expression of shyness and anxiety symptoms was examined only once, at the early age of 2.5 years. Future research should use a longitudinal design to compare the developmental stability of the positive and negative expressions of shyness with the onset of anxiety. Second, in order to gain more insight into the regulatory function of the expression of positive shyness, investigators in future research should explore the physiological level of anxiety during the expression of positive as well as negative shyness (e.g., blushing, heart rate). Third, in the present study, children's temperamental shyness and sociability were measured with two parent-reported subscales. In addition, the scale Sociability had low internal consistency, and the intercorrelations between parents in the PAS–R scales were in the small to moderate range. Therefore, the relation or lack of relation between the expressions of shyness, temperament, and anxiety should be interpreted with caution and further investigated using other informants in addition to the parents and observational measures. A last aspect that should be investigated is children's positive and negative expressions of shyness in relation to parenting styles. Belsky's (1997) theory on differential susceptibility for parenting proposes that highly behaviorally inhibited children are more susceptible to the effects of rearing. Thus, these children, in an advantageous rearing environment, may have better (social) outcomes than less behaviorally inhibited children. In line with this, positive shyness, in interaction with an advantageous parenting environment, may predict better (social) functioning. For instance, a secure parent–child relationship, in which a child feels safe, may specifically promote the positive display of shyness as a way to deal with social fear, thus improving interactions and giving the child the opportunity to develop important (social) skills.

## Conclusion

In conclusion, the present study offers new input for developmental personality research, providing evidence for a more heterogeneous dimension of shyness and expression of shyness already in early age. We also provide evidence for a more positive conceptualization of shyness, underscoring its positive and adaptive function in normative development.

The present study supports the view that regulatory strategies play an important role in the development of personality and in predicting the quality of social behavior (Eisenberg, Fabes, Guthrie, & Reiser, 2000). In particular, the positive expression of shyness seems to be a socially appropriate, "moderate" form of avoidance. Through this emotionally regulatory behavior, children may be able to minimize their feeling of social discomfort without severing the social ties within the situation. Our results also suggest the importance of reconsidering the role of shyness in psychopathology, since the positive expression of shyness may be a good candidate as protective factor in the development of anxiety disorders, especially social and generalized anxiety disorder. Hence, this regulatory skill could be taught to extremely shy or anxious children as a strategy for dealing with their social fear.

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