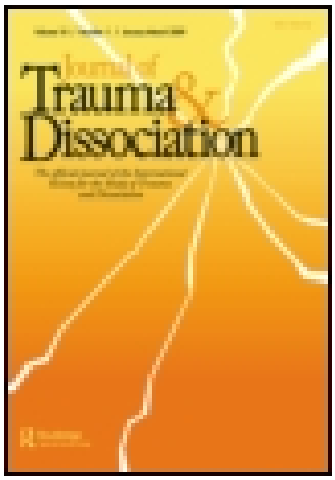

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Evaluation of the Swedish Version of Dissociation Questionnaire (DIS-Q), Dis-Q-Sweden, Among Adolescents

Doris Nilsson MA [a] & Carl Göran Svedin MD and PhD [b]
[a] Department of Child and Adolescent Psychiatry , Linköping University , Linköping, Sweden
[b] Department of Child and Adolescent Psychiatry , Lund University , Lund, Sweden
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Doris Nilsson, MA
Carl Göran Svedin, MD, PhD

ABSTRACT. The aim of this study was to investigate the psychometric properties of the Swedish version of the Dissociation Questionnaire in a normative adolescent population and also to investigate dissociative symptoms associated with trauma including sexual and physical abuse. A normative sample of 449 adolescents between the ages of 12 and 19 and a clinical group of 74 adolescents with known experiences of trauma, sexual and/or physical abuse was given Dis-Q-Sweden. A mixed group of 22 abused and non-abused adolescents who answered Dis-Q-Sweden was also interviewed by using the Structural Clinical Interview for DSM-IV Dissociative Disorders (SCID-D). A test-retest procedure was conducted with 90 subjects from the normative group. The results showed good reliability concerning both internal consistency and test-retest stability. Validity was tested in several ways (criterion, predictive, construct and concurrent) and found to be satisfactory. Significant differences for the total sum scores of Dis-Q-Sweden were found between the normative group and the clinical group with known sexual abuse ($p < 0.001$). The prevalence of dissociative symptoms (cut-off score > 2.5)

Doris Nilsson is affiliated with the Department of Child and Adolescent Psychiatry, Linköping University, Linköping, Sweden.

Carl Göran Svedin is affiliated with the Department of Child and Adolescent Psychiatry, Lund University, Lund, Sweden.

Address correspondence to: Doris Nilsson, MA, BUP-Elefanten, Department of Child and Adolescent Psychiatry, Faculty of Health Sciences, Linköping University, 581 85 Linköping, Sweden (E-mail: Doris.Nilsson@lio.se).

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was 2.3% in the normative group and 50% in the clinical group. Dis-Q-Sweden has proven to be a screening instrument with good psychometric properties and has proven to be able to capture dissociative symptoms in adolescents with self-reported trauma and known trauma (sexual abuse).

KEYWORDS. Dis-Q-Sweden, method, dissociation, adolescents, trauma

INTRODUCTION

Measures of dissociation have played a crucial role in establishing the clinical significance of dissociative symptoms in psychiatric disorders (van Ijzendoorn & Schuengel, 1996). The Dissociation Questionnaire (Dis-Q; Vanderlinden, van Dyck, Vandereycken, Vertnommen, & Verkes, 1993) and the Dissociative Experience Scale (DES; Bernstein & Putnam, 1986) are two screening instruments for dissociation recommended by the International Society for the Study of Dissociation (ISSD, 1997) in their guidelines for the assessment/screening for dissociation. Both the Dis-Q and the DES have shown good reliability and validity in different studies (Vanderlinden, 1993; van Ijzendoorn & Schuengel, 1996). The two screening instruments have shown high correlation in several studies (Vanderlinden, 1993). Most of the research has until recently concentrated on adults traumatized during childhood and because of this not as much is known about dissociation among children and adolescents as among adults. During the 1990s, this focus was changed when Putnam began to publish the results of his research with adolescents and children (Putnam, 1993; Putnam, Helmers, & Trickett, 1993; Putnam, 1997). There has since then been a growing interest in the features of dissociation during childhood and adolescence but no instrument on dissociation that focused on adolescents existed until the Adolescent Dissociative Experience Scale (A-DES) was developed (Smith & Carlson,1996; Armstrong, Putnam, Carlson, Libero, & Smith 1997; Putnam, 1997). The A-DES is based on the adult DES questionnaire. The Dis-Q is the only instrument for the assessment of dissociation developed in Western Europe. Since Swedes and people from Belgium and the Netherlands share many cultural traits, the Dis-Q was chosen for this study (Hofstede, 1982). The choice was also sup-

ported by several international studies pointing out the necessity of scientifically standardizing measures of dissociation in the culture where the questionnaire is to be used (Somer, Dolgin, & Saadon, 2001; Zoroglu, Sar, Tuzun, Tutkun, & Savas, 2002; Zoroglu, Tuzun, Ostruk, & Sar, 2002).

Dis-Q

The Dis-Q was developed by Vanderlinden and colleagues and tested originally on two representative samples: one in Belgium ($N = 374$) and one in the Netherlands ($N = 378$) (Vanderlinden, 1993). After factor analysis 4 subscales resulted: identity confusion; loss of control over behavior, thoughts, and emotions; amnesia; and absorption. The Dis-Q showed good internal consistency (Cronbach's alpha 0.96 for the total scale and 0.67-0.93 for the subscales. Test-retest reliability was 0.94 for the total scale and 0.75-0.93 for the subscales). Construct validity showed that patients with dissociative disorders obtained significant higher scores on the Dis-Q than several other clinical samples. The Dis-Q and DES have differences and similarities. The DES is shorter with only 28 items and employs only three theoretical subscales: amnesia, depersonalization/derealization, and absorption. Dis-Q employs 4 subscales; three of the 4 are more or less comparable with the 3 DES subscales. A test of concurrent validity showed a correlation of $r = 0.85$ between the total scale of the Dis-Q and the DES, $r = 0.82$ between identity confusion (Dis-Q) and depersonalization/derealization (DES) and $r = 0.78$ between the amnesia subscales in both questionnaires (Vanderlinden et al., 1993). The factor structure of both questionnaires has been questioned and Bernstein, Wheathersbee, Ellason, Ross, & Vanderlinden, (2001) have suggested a single factor solution for both questionnaires. Vanderlinden (1993) has tested the Dis-Q on different populations with traumatic backgrounds including one group with self- reported trauma and several different patient groups in which individuals had been subjected to serious traumatic experiences such as incest and sexual abuse. People with traumatic backgrounds gave significantly higher scores on the Dis-Q than people without traumatic backgrounds.

The Dis-Q has since its development been translated and used in several European countries such as Hungary (Vanderlinden, Varga, Peuskens, & Pieters, 1995), Italy (Santonastaso, Favaro, Olivotto, & Frederici, 1997) France and Switzerland (Mihaescu et al., 1998), The Netherlands (Vandereyken &Van Houdenhove,1996; Nijenhuis, Spinhoven, van Dyck, van der Hart, & Vanderlinden, 1997; Nijenhuis,

Spinhoven, van Dyck, van der Hart, & Vanderlinden, 1998; Lange e al., 1999), and Great Britain (Hartman, Crisp, Sedgwick, & Borrow, 2001).

The first study in Sweden on dissociation and adolescents was a pilot study conducted by the authors of the present paper (Svedin, Nilsson, & Lindell, 2004). In the pilot study the Swedish version of the Dis-Q was distributed to 230 adolescents between 15 and 17 years old. In the study 216 adolescents (equal numbers of boys and girls) answered the Dis-Q. A clinical group was also included consisting of 30 adolescents 14-19 years old, mostly girls (25 girls and 5 boys). They were all traumatized (corroborated by police reports and journals) and most of them had been sexually abused but a few were refugees (from zones of ongoing war) with dissociative symptoms, and all of them were in contact with child and adolescent psychiatrists. The results showed good test-retest reliability (Spearman's rho = 0.77), good to excellent internal consistency (Cronbach's alpha = 0.96, Guttman split half coefficient = 0.92), and high correlation with the Youth Self Report (Achenbach, 1991) which was expected. The pilot study showed a prevalence of dissociation in the normal group of 8.8% (using a cut-off point of 2.5 recommended by Vanderlinden). Significant differences ($p < 0.001$) were obtained between the normal group and the clinical trauma group. Significant differences were also found in the normal group between a group of adolescents with self-reported trauma (not corroborated data) and a group of adolescents with no self-reported trauma ($p < 0.01$). The aim of the pilot study was to start a standardization of the Dis-Q as a screening instrument for dissociation for Swedish adolescents.

Other international studies where the Dis-Q has been used in screening for dissociation among adolescents are few and have not been restricted to the investigation of adolescents. In two studies we know of, the adolescents have only been a part of the whole normative population and have been grouped together, for example, 10-20 years old (Vanderlinden, 1993; Vanderlinden et al., 1995).

Study Aim

The aim of the present study was to test the validity and reliability of the Swedish version of the Dissociation Questionnaire (Dis-Q-Sweden) and continue its standardization. The pilot study needed to be replicated with more subjects participating in the study for the purpose of giving Swedish child and adolescents psychiatric clinicians a reliable and useful screening instrument to detect dissociation among adolescents (Svedin et al., 2004). We also wanted to study the prevalence of dissociation

in a normative adolescent sample and to study the connection to trauma/sexual abuse. We hypothesized that dissociative symptoms should be more frequent among adolescents with known experiences of sexual abuse trauma (a clinical group with corroborated data of trauma) than among adolescents with or without self-reported trauma (no corroborative data) in the normative sample. We postulated that those with self-reported trauma would display more dissociative symptoms than those without self-reported trauma. We also wanted to investigate if there were any gender differences in the normative sample and to study the prevalence of dissociation during the span of adolescence.

METHODS

Subjects

Normative Group

Our intent was to sample groups of adolescents between 13 and 19 years of age from different socioeconomic areas in Linköping. Linköping is a city with 120,000 inhabitants and could be said to be representative for Sweden in terms of gender distribution, ethnicity, and family socioeconomic status. It includes both an urban and rural area as do most cities in Sweden. With the intention of covering different socioeconomic areas in Linköping, four schools were randomly chosen from all the schools in the compulsory school system and among them three classes each in grades 7 through 9. Five classes from all schools with secondary education representing five different educational programs were randomly chosen with the intention of covering pupils from different socioeconomic groups. In Sweden, different secondary schools offer distinctly different kinds of educational programs and thus may have quite different groups of pupils. Some schools offer more than one type of program.

A total of 449 adolescents participated in this study, and 400 adolescents from this group answered the Dis-Q-Sweden. For the purpose of test-retest reliability assessment, 79 (dropout $n = 11$) of the 400 filled in the questionnaire a second time 3 weeks later.

A total of 313 adolescents from the compulsory school and 136 adolescents from the secondary school were asked to answer the Dis-Q-Sweden. There were 33 drop outs from compulsory school and 16 from the secondary school resulting in a participation rate of 89.1%. Most of the dropouts were due to illness.

In Sweden the compulsory school for adolescents consists of three grades, 7th, 8th, and 9th, and most children start in this school at age of 13 and finish at age 15-16. In our sample we have 89 subjects from 7th grade, 46 boys and 43 girls (drop outs 5), 90 from 8th grade, 44 boys and 46 girls (drop outs 15) and 100 from 9th grade, 56 boys and 44 girls (drop outs 13). The group from secondary school came from different educational programs and consisted of 121 adolescents, 64 boys and 57 girls (drop outs 16). The mean age in the normative group was 15.07 years (SD = 1.92).

The secondary school also consists of three grades but we decided to have a sample from only the second grade as students at this level represent a somewhat ordinary period of late adolescence. This group was asked to participate during the spring just as they were about to leave the second grade and go into the third grade at the end of the summer. We also considered asking the first grade in secondary school but thought it was not necessary as we covered 7th, 8th, and 9th grades. No school that was asked refused to participate.

Clinical Group

In the clinical group there were 74 patients, all of whom had been patients in the Child and Adolescent Psychiatry Clinic in Sweden. Most of them came from two units for treatment of sexually abused children (BUP-Elefanten, BUP-Vasa) and a center for refugee children. BUP-Elefanten is an outpatient unit for children and adolescents who have been sexually and/or physically abused; it is situated in Linköping and was established in 1995.

The unit is intended to serve the whole county of Östergötland and also provide some service to the entire country. Most cases of children and adolescents who have been sexually abused in the county come to BUP-Elefanten for assessment and treatment. BUP-Elefanten works closely with the social authorities and the police system. BUP-Vasa is situated in Stockholm and is also an outpatient unit. The work there is mostly with psychotherapy groups for children and adolescents who have been sexually abused, and the patients come from the entire Stockholm region.

The Refugee Family Center is located in Linköping and provides a meeting place and service for refugee children and adolescents coming from war zones all over the world. The adolescents from this center in our sample were referred to BUP-Elefanten for consultations. All had been sexually abused.

All of the participants in the clinical group had a trauma background with sexual abuse and/or physical abuse reported by the adolescents themselves and corroborated or documented by the police and/or social authorities.

The age in the clinical group varied between 12 and 19 years: Three adolescents were 12-13 years old, 28 were 14-15 years old and 43 were 16-19 years old. Mean age for the clinical group was 16.03 (*SD* = 1.81).

The clinical group included a total of 64 girls and 10 boys. One boy was in the 12-13 year age range, six boys were 14-15 years old and three were 16-19 years old. The mean age for boys was 14.80 (*SD* = 1.23). Two girls were 12-13 years old, 22 were 14-15 years old and 40 were 16-19 years old. The mean age for girls was 16.22 (*SD* = 1.82).

A mixed group consisting of 22 adolescents with an unknown clinical or normal background was used to examine the sensitivity and specificity of the Dis-Q-Sweden. This group consisted of 19 adolescent girls and 3 adolescent boys, all between 11 and 17 years of age. Mean age in this group was 15.4 (*SD* = 1.7) years old. Of these adolescents 17 came from the intake procedure at BUP-Elefanten (as all other clinical cases from BUP-Elefanten) and were mixed blind with 5 normal children without any clinical background to create the group for the SCID-D interview. They first got the Dis-Q-Sweden questionnaire and were then interviewed with SCID-D, the "gold standard" in the assessment of dissociation. The interviewer was blind to the results of the Dis-Q-Sweden.

Questionnaires

Dis-Q-Sweden

The Dis-Q is an instrument for the assessment/screening of dissociation. After the first pilot study was carried out in Sweden in 1998, the version of the Dis-Q used in Sweden was given the name Dis-Q-Sweden (Svedin et al., 2004). Dis-Q-Sweden like the original Dis-Q is composed of 63 items with 5 different answering alternatives. The subject has to circle one of 5 answers, indicating to what extent that item or statement is applicable to that particular subject (1 = Not at all; 2 = A little bit; 3 = Moderately; 4 = Quite a bit; 5 = Extremely). The scale is designed to contain 4 subscales all of which are intended to measure different aspects of dissociation. The subscales are identity confusion/fragmentation, 25 items; loss of control, 18 items; amnesia, 14 items; and absorption, 6 items. A total score and 4 subscale scores are obtained by dividing the total raw score by the number of included items.

The Dis-Q-Sweden also collects data on age, sex, educational level, civil status, and a listing of previous experiences of trauma (severe bodily injury, physical abuse, state of war, sexual abuse by family member or by someone outside the family, emotional maltreatment, diseases, and other). The Dis-Q is suitable for subjects age 13-14 and older.

SCID-D

The Structured Clinical Interview for DSM-IV- Dissociative Disorders (SCID-D), is a semi-structured diagnostic interview for the assessment of symptoms of dissociation, including severity and nature of symptoms (Steinberg, 1994). The SCID-D rates the severity of five core dissociative symptoms including amnesia, depersonalization, derealization, identity confusion, and identity alteration. Many questions are open-ended and are worded specifically for the detection of dissociative disorders. The SCID-D was developed for, and is mostly used for, the assessment of adults but has been used in some studies with adolescents: one three-case study and one pilot study (Steinberg & Steinberg, 1995; Carrion & Steiner, 2000). In both of these studies the SCID-D seemed to work well for the assessment of adolescents displaying dissociation. This is the first study using the SCID-D for validation of the Dis-Q among adolescents.

Research Procedure

The headmaster from each school was first contacted by letter and then by telephone. When the headmaster had made a list of teachers and classes, written information was given to pupils and parents. After informed consent was obtained one researcher went to the class and administrated the self-questionnaires. All questionnaires were answered anonymously. In the four classes that were involved in the test-retest procedure the teacher coded the questionnaires to make certain that no subject could be identified by the researcher and to ensure that the same pupil was matched with him/herself when the retest of the questionnaire was done. The retest procedure was done three weeks after the first test occasions. For the purpose of test-retest reliability, 79 (dropouts 11) pupils answered the Dis-Q the second time. Three weeks between the two test occasions was considered to be a reasonable time in order to capture the degree of stability in the answers and at the same time to ensure that the answers were not too greatly influenced by the individual's recollections of the answers given during the first test. The test-retest group of 90 subjects all came from 8th and 9th grades.

All questions and difficulties were taken care of directly. Anybody who wanted help or felt upset while answering the instrument was offered counseling. No subject said that he or she felt upset while answering the questionnaires or needed counseling afterwards.

Ethical Considerations

The study was approved by the Human Research Ethics Committee, Faculty of Health Sciences, Linköping University.

Statistics

The statistical program SPSS 11.5 was used throughout. Analysis of internal consistency and reliability analysis was obtained with Cronbach's alpha, Guttman Split-Half and Spearman-Brown. For the test-retest reliability Pearson's Correlation was used.

A confirmatory factor analysis on the normative group ($n = 400$) was conducted to evaluate the validity of the instrument. When performing the factor analysis, principal component analysis as well as Varimax rotation with Kaiser normalization was used as the extraction method and rotation method, respectively.

To test the significance of the differences between the normative group and the clinical group (the total sum and the four factors–identity confusion, loss of control, amnesia, and absorption) t-tests were used. When the variances of the two groups differed significantly (tested by means of the Levene's test) the degrees of freedom and t-values were adjusted accordingly. Two-way analysis of variance (ANOVA) with the (mean) total score as the dependent variable and gender and age as independent factors was used to estimate differences within the normative group. Three-way analysis of variance (ANOVA) was used to estimate the differences in the three groups: no self-reported trauma, self-reported trauma, and clinical group with known experienced trauma/sexual abuse.

RESULTS

Reliability

Internal consistency measured by Cronbach's alpha for the questionnaire using the normative group ($n = 400$) was found to be 0.97 for the total sum of Dis-Q-Sweden and for the four factors Dis-Q I (*identity*

confusion/fragmentation) 0.95, Dis-Q II (*loss of control*) 0.90, Dis-Q III (*amnesia*) 0.88 and Dis-Q IV *(absorption)* 0.65, respectively. When Guttman Split-Half was used the alpha range was 0.94-0.92, and Spearman-Brown 0.90. Cronbach's alpha for the clinical group ($n = 74$) was 0.97 for the total scale and for the subscales Dis-Q-I 0.96, Dis-Q II 0.91, Dis-Q-III 0.88 and Dis-Q-IV 0.58.

Test-retest reliability ($n = 79$) with Pearson's Correlation was found to be 0.79 ($p < 0.001$), and for the four subscales Dis-Q I, Dis-Q II, Dis-Q III, and Dis-Q IV, the correlation values were 0.80, 0.74, 0.75, and 0.51, respectively (all $p < 0.001$).

Validity

Construct Validity

Factor analysis. A varimax rotated solution restricted to four factors (confirmatory factor analysis) was tested and explained 47.8% of the total variance (eigenvalues >1) (Table 1).

The first factor, identity confusion, explained 18.2% of the variance and the 25 items from Vanderlinden's study all had loadings over 0.30. Item number 22 loaded higher on factor 3 (amnesia) than on factor 1 and items number 12, number 50, and number 62 loaded higher on factor 2 (loss of control).

The second factor, loss of control, explained 13.4 % of the variance and 15 out of the 18 items from Vanderlinden's study had loadings over 0.30. Four items, numbers 5, 38, 43, and 54, all items concerning memories and remembering, loaded better on factor 3 (amnesia).

The third factor, amnesia, explained 12.4 % of the variance and 12 out of 13 items from Vanderlinden's study had loadings over 0.30. Three items, numbers 21, 26, and 19 loaded higher on factors 1 and 2, and numbers 45 and 47, loaded higher on factor 2.

Finally, the fourth factor, absorption, explained 3.7 % of the variance and 3 out 6 items from Vanderlinden's study had loadings over 0.30. The other three items, numbers 33, 42, and 56, had loadings over 0.30 on factor 1 or 2.

Criterion-Related Validity

Differences between the normative group and the clinical group. In the normative group the mean for the total scale Dis-Q-Sweden was 1.42 ($SD = 0.43$) and for the subscales 1.29 ($SD = 0.44$) (identity confu-

TABLE 1. Factor Loadings for a 4-Factor Solution for Dis-Q-Sweden (47.75% of the Variance Is Explained by These 4 Factors) and the Original Position in Vanderlinden's Dis-Q Structure

Item Number		Factor 1	Factor 2	Factor 3	Factor 4	Dis-Q Number
7	It happens that I have the feeling that I am somebody else	**0.82**		*0.32*		I
30	I have the feeling that my body is not (really) mine	**0.75**				I
34	At times it seems as if someone else inside me decides what I do	**0.77**				I
59	I have the feeling that I am made up of two (or more) people	**0.76**				I
63	It happens that I am looking at the world through a haze, so that the people and things surrounding me appear remote or vague	**0.70**				I
3	At times I wonder who I am exactly	**0.68**				I
29	It happens that I have the feeling that other people, other things and the world surrounding me, are not real	**0.66**				I
61	It happens that I hear voices in my head telling me what I am doing or making comment on what I am doing	**0.63**		*0.37*		I
9	When I am tired, it seems as if a strange power from outside takes possession of me and decides for me what to do	**0.61**		*0.36*		I
36	I wonder how I can prevent myself from doing certain things	**0.60**	*0.32*			I
28	It happens that I get the feeling that my body undergoes an alteration	**0.56**				I
57	It happens that I have the feeling that my mind is split up	**0.56**	*0.51*			I
20	In particular situations I experience myself as a split personality	**0.56**	*0.34*			I
2	I regularly have the feeling that everything is unreal	**0.56**	*0.33*			I
11	At times I feel a great distance between myself and the things I think and do	**0.54**	*0.33*			I
27	It happens that I look in the mirror without recognizing myself	**0.53**				I
41	Sometimes I think or do something against my liking in a way that does not suit me at all	**0.52**	*0.31*			I

TABLE 1 (continued)

Item Number		Factor 1	Factor 2	Factor 3	Factor 4	Dis-Q Number
40	I have the feeling that I do certain things without knowing why	**0.49**	*0.46*			I
16	It happens that I am determined to do something, but my body acts quite different against my own will	**0.48**		*0.34*		I
12	At times I wonder who I am exactly	0.47	***0.58***			I
10	I get in situations in which I do not want to be	**0.42**	*0.41*			I
39	Sometimes I find myself in a well-known place that appears strange and unknown to me	**0.42**		**0.42**		I
62	I see myself differently from the way other people see me	0.40	***0.48***			I
50	I wish I had more control of myself	0.37	***0.46***		*0.34*	I
22	It happens that I am about to say something but something quite different crosses my lips	0.35	*0.34*	***0.45***		I
44	It happens that I stare aimlessly without thinking about anything		**0.60**	*0.36*		II
48	When eating, I do so without thinking about it		**0.59**			II
17	It happens that I feel confused		**0.59**	*0.31*		II
49	It happens that I catch myself day-dreaming		**0.57**			II
24	It happens that I do something without thinking about it	*0.31*	**0.57**	*0.33*		II
4	I gorge myself with food without thinking about it	*0.34*	**0.56**			II
23	There can be a sudden, complete change in my mood		**0.55**			II
6	I can, without reason, without wanting to, burst out laughing or crying	*0.33*	**0.51**			II
14	I regularly feel an urge to eat something, even when I am not hungry		**0.51**			II
8	It happens that I am listening to someone and suddenly realize that I have not heard part or the whole of the story		**0.51**	*0.40*		II
46	I find it very hard to resist bad habits	*0.34*	**0.51**			II
15	It happens that I am listening to someone and suddenly realize that I have not heard part or the whole of the story	*0.37*	**0.50**			II

Item Number		Factor 1	Factor 2	Factor 3	Factor 4	Dis-Q Number
1	At times I have the feeling that I am dreaming	*0.33*	**0.46**	*0.34*		**II**
60	I often do something without thinking about it		**0.43**	*0.42*		**II**
43	I can enclose myself in fantasies or daydreaming so much so that it seems to be really happening	*0.39*	0.31	***0.42***		**II**
5	While driving and/or bicycling, I suddenly realize that I cannot remember what happened on the way			***0.53***		**II**
38	It happens that I am not sure whether certain memories have really taken place or if I merely dreamed about them			***0.45***		**II**
54	I lose every notion of time	*0.35*		***0.38***		**II**
35	Sometimes I discover that I have done something without remembering anything about it	*0.35*		**0.68**		**III**
25	I immediately forget what other people tell me			**0.68**		**III**
37	Sometimes I suddenly notice that I find myself in a place that is unknown to me, without knowing how I get there	*0.32*		**0.65**		**III**
13	It happens that I find new articles among my things without being able to remember ever having purchased them	*0.31*		**0.64**		**IIII**
18	At moments I cannot remember where I was the day (or days) before			**0.63**		**III**
55	It happens that I cannot remember whether I have really done something or if I merely planned it			**0.63**		**III**
32	It happens that entire blocks of time drop out and I cannot remember what I did then	*0.35*		**0.59**		**III**
58	It happens that I find notes, drawings or annotations of my own, without remembering having ever made these			**0.55**		**III**
31	When I watch television, I do not notice anything that goes on around me		*0.34*	**0.49**		**III**

TABLE 1 (continued)

Item Number		Factor 1	Factor 2	Factor 3	Factor 4	Dis-Q Number
47	I sometimes forget where I have put something		***0.54***	0.41		**III**
21	It happens that I cannot remember anything about certain important events in my life, such as my final examinations or wedding-day	***0.48***		0.41		**III**
26	It happens that I am doing something and I am suddenly struck by a blackout	***0.44***		0.40		**III**
45	I often think about nothing		***0.56***	0.32		**III**
19	It happens that I am told that I act as if friends or family members were strangers to me	***0.39***				**III**
51	When I walk, I am aware of each step I make				**0.71**	**IV**
53	When eating, I am aware of every bite I take				**0.68**	**IV**
52	In particular situations, I notice that I am able to do certain things with the greatest ease, that I find hard to do in others (e.g. sports, work, social contacts)		*0.34*		**0.39**	**IV**
56	It happens that I want to do two things at the same time and that I notice that I am arguing with myself the pros and cons		***0.37***			**IV**
42	I notice that I watch myself closely in everything I do	***0.42***		*0.32*		**IV**
33	I can remember so vividly something that happened formerly, that I have the feeling that I am reliving it	***0.39***	*0.37*			**IV**

Note. All factor loadings above 0.30 shown in theoretical factors and otherwise in italics. Highest factor loading shown in bold style.

sion), 1.58 ($SD = 0.53$) (loss of control), 1.38 ($SD = 0.42$) (amnesia) and 1.65 ($SD = 0.61$) (absorption) see Table 2. For the clinical group the mean for the total scale was 2.52 ($SD = 0.80$) and for the subscales 2.26 ($SD = 0.97$), 2.89 ($SD = 0.87$), 2.27 ($SD = 0.81$) and 2.56 ($SD = 0.76$), respectively. The mean differences between the clinical and the normative group were significant for the total sum of Dis-Q-Sweden and for the sum of each of the four subscales (all $p < 0.001$).

TABLE 2. Differences Between Normative Group and Clinical Group[1]

	Normal Group All (*n* = 400)		Clinical Group All (*n* = 64)		*t*	*p*	Normal Girls (*n* = 191)		Clinical Girls (*n* = 64)		*t*	*p*
	Mean	***SD***	**Mean**	***SD***			**Mean**	***SD***	**Mean**	***SD***		
Total scale	1.42	0.43	2.52	0.80	11.50	<0.001	1.52	0.47	2.60	0.80	10.08	<0.001
Identity confusion	1.29	0.44	2.46	0.97	10.24	<0.001	1.37	0.50	2.56	0.97	9.40	<0.001
Loss of control	1.58	0.53	2.81	0.87	11.77	<0.001	1.74	0.59	2.90	0.85	10.13	<0.001
Amnesia	1.38	0.42	2.27	0.81	9.24	<0.001	1.45	0.46	2.29	0.84	7.66	<0.001
Absorption	1.65	0.61	2.56	0.76	9.75	<0.001	1.71	0.42	2.58	0.79	8.10	<0.001

[1] Data from 10 clinical boys were available, who gave responses close to the clinical girls. However, the clinical group of boys was omitted for separate analyses since it was considered too small to draw any conclusions on.

Concurrent Validity

The DSM-IV based clinical interview SCID-D was used as the "gold standard" against which the Dis-Q-Sweden was tested. When using the Dis-Q-Sweden cut-off score of 2.5 the sensitivity of the Dis-Q-Sweden was 69.2 percent and the specificity 100 percent meaning that the Dis-Q-Sweden identified 69.2 percent of the cases with 30.8 percent as false negatives. On the other hand, there were no false positive cases. If the cut-off point was set to 2.4 the sensitivity rose to 84.6 percent with still no false positive cases. The positive predictive value (PPV) was 100 and the negative predictive value (NPV) was 69.2.

Age and Gender, Normative Group

The normative group was divided into three age groups: 12-13 years old, 14-15 years old and 16-19 years old. We found a significant difference in total score between the age groups 12-13 years old and 14-15 years old ($p < 0.05$). The results showed that the age-group 12-13 years old had the lowest mean and the age group 14-15 years old had the highest.

In this study about one half of the normative group consisted of adolescent boys (209) and the other half of adolescent girls (191). The girls had higher means than the boys. The differences of means between boys and girls were significant ($p < 0.001$), see Table 3.

Prevalence of Dissociation

The prevalence of dissociation in the normative group was 2.3% if the cut-off was initially set at 2.5, which is the cut-off point Vanderlinden used. In the clinical group the prevalence of dissociation was 50% with the cut-off at 2.5. Chi-Square Tests showed significant differences between the groups ($p < 0.001$) with cut-off at 2.5.

Prevalence of Trauma in the Normative Population

In the Dis-Q-Sweden there are also questions asking if you have experienced any kind of trauma. There are two alternative answers: Yes or No. If the answer is yes then there are further questions concerning the kind of trauma experienced. In the normative group, 329 of the 400 adolescents declared that they had not experienced any kind of trauma. Sixty-two answered yes, nine were missing. The difference in means on

TABLE 3. Total Score on the Dis-Q* Sweden in the Normative Group in Relation to Age and Gender

Age Group	*n*	Gender	Mean (Total Score)	*SD*	95% CI
12-13	53	Boy	1.32	.33	1.21-1.43
	54	Girl	1.36	.31	1.25-1.47
	107	All	1.34	.32	1.26-1.42
14-15	91	Boy	1.33	.42	1.24-1.46
	80	Girl	1.64	.51	1.55-1.73
	170	All	1.47	.49	1.42-1.55
16-19	65	Boy	1.36	.30	1.26-1.46
	57	Girl	1.52	.51	1.41-1.62
	122	All	1.44	.42	1.37-1.55
Total	209	Boy	1.34	.36	1.28-1.39
	191	Girl	1.52	.47	1.45-1.57
	400	All	1.43	.43	1.38-1.46

*Two-way analysis of variance.
* Gender differences $F = 7{,}108$, $p < .001$; age differences $F = 4.034$, $p < .05$; age and gender differences $F = 3{,}564$, $p < 0.05$.

the total sum of Dis-Q-Sweden between these two groups who answered *yes* or *no* on whether they had experienced any kind of trauma was found to be significant ($p = 0.002$). There were also significant mean differences in these two groups on all the subscales (see Table 4). Of the 62 who had answered yes on having experienced trauma 21 had suffered severe bodily injury, 13 physical abuse, 5 state of war, 2 sexual abuse by family members, 8 sexual abuse by others (non-family members), 10 emotional maltreatment, and 13 answered "other." This category "other" included illness (3), somebody in the family died (5), dad killed himself (1), I tried to take my own life (1), car accident (2), and I was sexually offended (1).

Analysis of Variance in the Three Groups

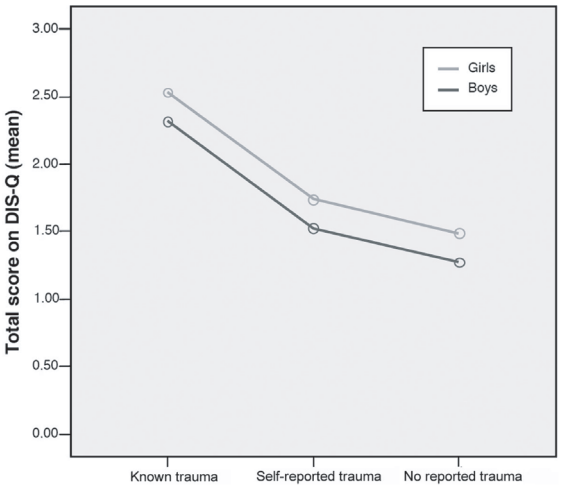
A three-way analysis of variance was done between the normative group with no self-reported trauma, the normative with self-reported trauma and the clinical group with known experienced sexual abuse. The Dis-Q means (total score, and the subscales) were the dependent variables, and age and gender were adjusted for. See Table 4 and Figure 1. The results give a very clear picture of the gender differences and Dis-Q scores.

TABLE 4. Mean Differences Between the Three Groups (No Self-Reported Trauma, Self-Reported Trauma and Known Experienced Trauma/Sexual Abuse) on Total Dis-Q Scores and the Four Subscales

	n	Total Score*		Dis-Q I**		Dis-Q II***		Dis-Q III****		Dis-Q IV*****	
		Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI	Mean	95% CI
No self-reported trauma	329	1.38	1.33-1.43	1.24	1.18-1.30	1.53	1.47-1.59	1.35	1.29-1.40	1.62	1.55-1.69
Self-reported trauma	62	1.63	1.51-1.76	1.53	1.39-1.66	1.81	1.67-1.96	1.51	1.39-1.63	1.83	1.67-1.98
Clinical known sexual abuse	74	2.43	2.30-2.55	2.37	2.40-2.51	2.64	2.50-2.78	2.09	2.09-2.33	2.49	2.34-2.65

Note. Three-way analysis of variance (ANOVA) results adjusted for age and gender.
* Gender $F = 20.89$, $p < 0.001$; group $F = 122.06$, $p < 0.001$; age $F = 2.77$, $p = 0.06$.
** Gender $F = 14.85$, $p < 0.001$; group $F = 117.03$, $p < 0.001$; age n.s.
*** Gender $F = 37.87$, $p < 0.001$; group $F = 103.02$, $p < 0.001$; age $F = 4.19$, $p = 0.016$.
**** Gender $F = 7.43$, $p = 0.007$; group $F = 82.03$, $p < 0.001$; age $F = 3.31$, $p = 0.037$.
***** Gender $F = 3.08$, $p = 0.08$; group $F = 20.10$; $p < 0.001$, age n.s.

FIGURE 1. Dis-Q scores by gender and trauma group.



DISCUSSION

This is the second study in Sweden using the Dis-Q-Sweden for the exploration of dissociation among Swedish adolescents and its connection to trauma. It was important to evaluate the psychometrics of the Swedish translation of the scale, the relevance of dissociation in Sweden and the connection to trauma.

The reliability considering internal consistency was shown to be good to excellent for the total scale (alpha 0.96) and the four subscales (alphas of 0.95, 0.91, 0.88, 0.65) and was in line with our former pilot study and all other studies where the Dis-Q has been used (Svedin et al., 2004; Vanderlinden, 1993; Vanderlinden et al., 1993; Vanderlinden et al., 1995; Mihaescu et al., 1998).

Test-retest reliability can also be said to be satisfactory and was the same as in the pilot study (0.79) but a little weaker than in Vander linden's research where he has found test-retest results as high as 0.94 for the total scale (Vanderlinden, 1993). The reason for this difference is not clear but half of his populations were adults who can be expected to be more stable overall than adolescents concerning psychological traits and qualities. Of note is that the absorption subscale had a lower alpha

than the other three subscales for both the normative group and the clinical group, which was also true for test-retest reliability. This finding is also in line with earlier studies (Vanderlinden, 1993).

Construct validity was studied and the confirmatory factor analysis came up with a structure rather close to Vanderlinden's proposed four factor structure (Vanderlinden, 1993). All of the original 25 items in factor Dis-Q 1 could be found in the same factor with a factor loading over 0.30. Only four of the items had higher loadings on Dis-Q 2 or Dis-Q 3. Some of the items (12, 62) could by their meaning be kept in factor 1, while item 50 preferably could be placed in factor 2. The second factor Dis-Q 2 also turned out to be close to Vanderlinden's factor structure. Of the original 18 items in Dis-Q 2, four items loaded higher on Dis-Q 3 but considering the meaning and content of these four items they could as well belong to Dis-Q 3. These items all ask questions about forgetting, losing track of time and not knowing if things have happened or not. The original factor 3 (Dis-Q 3 amnesia) contains 14 items, and all but one (19) loaded over 0.30 on that factor, but four items had a higher loading on Dis-Q 1 or Dis-Q 2. By face validity item number 19 could very well be moved to Dis-Q 1. Items 21 and 26 could by their wording be kept in factor 3 since the both reflect qualities of amnesia, while item 45 could preferably be moved to factor 2. For the last factor (Dis-Q 4 absorption), on which Vanderlinden used six items, we could only find three items with factor loadings over 0.30. The other three loaded higher on Dis-Q 1 and 2. These results for the fourth factor are consistent with other studies. Vanderlinden found that this fourth factor has weaker psychometric properties than the other factors. Santonastaso (Santonastaso et al., 1997) performed the same principal component analysis on data from a group of female college students in Italy and four of the Dis-Q 4 items did not load on any factor. In Santonataso's study, item 51 was heavily negatively correlated with the scale; in our study it belonged to the predicted factor (Dis-Q 4) but was on the other hand the only item in this study that did not differentiate between the normative group and the clinical group. Item 53 was another item which loads heavily on factor 4 but did not differentiate so strongly between the two groups. Santonataso found that item 53 didn't correlate at all with the scale. The weakness of this fourth factor, must be taken into consideration. One suggestion is to rework the items, trying to better capture the symptom of absorption, if a four factor solution is to be kept.

Another solution could be to drop this fourth factor and use a three factor solution. The meanings of items 51 and 53 raise serious doubts

about whether they should be retained in the Dis-Q at all. None of the other items in factor four (52, 56, 42, and 33) had loadings that qualify them to be added to any other factor. Even if doubts have arisen about the four factor structure and the multi-dimensionalities of the Dis-Q (Bernstein et al., 2001), the overall evaluation of the principal component analysis in this study suggests that the factor structure is meaningful and that it is principally in accordance with Vanderlinden's original structure. A revised version with three factors and 57 items should be tested.

Criterion and predictive validity were tested against our hypothesis that adolescents with known experienced trauma in the clinical group would have significantly higher Dis-Q-Sweden scores than adolescents with no self-reported trauma. This hypothesis was verified. The same results were found in our pilot study (Svedin et al., 2004) as well as in other studies where the Dis-Q has been used (Vanderlinden, 1993). When comparing the clinical group with the normative group it should be noted that the standard deviation in the clinical group is larger than in the normative. This may be explained by the fact that adolescents who have experienced the trauma of sexual abuse are more likely to have extreme dissociation scores than the normal non-traumatized adolescent population. This observation underlines the importance of a screening instrument like the Dis-Q-Sweden to help traumatized adolescents who have reacted with a high degree of dissociative symptoms to be recognized and given adequate therapeutic help.

The hypothesis that there should be a significant difference in Dis-Q scores in the normative group between adolescents with self-reported trauma and adolescents with no self-reported trauma was also verified. This finding is consistent with our prior pilot study and other studies (Svedin et al., 2004; Vanderlinden, 1993; Santonastaso et al., 1997). It seems that this group of adolescents self-reporting trauma is an intermediate between those reporting no trauma and a clinical sample.

Concurrent validity was obtained by having a group of adolescents fill in the Dis-Q-Sweden and then having the same adolescents complete a SCID-D interview. The results showed high agreement between Dis-Q-Sweden and the SCID-D interview and high sensitivity. The specificity was lower but satisfactory and was improved if the cut-off point was lowered to 2.4. This could suggest that the cut-off point should be lowered, but the result should be taken with some caution considering the rather small sample. We suggest that total scores of 2.3-2.4 should be seen as a sub-clinical area and as an indication for further diagnostic efforts.

As there are few studies related to adolescents, dissociation, and trauma, and none that we have found where the Dis-Q has been used on the same type of young population used in the current study, it is impossible to compare means and differences. However, the present study confirms the results of our pilot study and indicates a strong linkage between sexual/physical abuse and maltreatment and dissociative symptoms.

One of the aims of this research was to look at the differences between boys and girls on Dis-Q-Sweden scores as we had found gender differences in the former study in the prevalence of dissociative symptoms. These gender differences were confirmed, with girls having higher scores than boys ($p < 0.001$). Gender differences have not been found in other studies and since this gender difference during adolescence is not well understood more research is needed.

The prevalence of dissociation in the normative adolescents group, using the preliminary cut-off score of >2.5, was 2.3% which is the same prevalence of dissociation that Vanderlinden (1993) found in a normative population in The Netherlands and Belgium. It is much lower than what we found in our pilot study where we had a prevalence rate of 8.8%, a rate that is as high as the prevalence rates found in countries like Hungary and in a college-student population in Russia (Svedin et al., 2004; Vanderlinden et al., 1995; Dalenberg & Gronskaya Palesh, 2004). The reason for the high rates of prevalence of dissociation in these studies has been discussed and it has been speculated that it could be related to the fact that the people studied live in what were formerly totalitarian societies that had also suffered great losses during the Second World War. The prevalence of trauma differed between this study (15.5 %) and the pilot study (24.5 %, a population including a high percentage of war refugees) and since there is a correlation between trauma and dissociation this probably explains a part of this difference.

Finally, in this study we conducted many analyses resulting in many significant differences, and it is, therefore, wise to consider the levels of significance with some caution. In addition, the sample size is not considered large enough to establish a new cut-off score for Dis-Q-Sweden instead of the preliminary cut-off score of >2.5, so the use of a cut-off below 2.5 should be undertaken with caution. Finally, a weakness of this study, and a challenge for further studies, is that we do not know how different adolescent psychiatric patient categories with and without trauma would have answered questions in the Dis-Q-Sweden. It would be of great interest to learn about how common dissociative symptoms are among Swedish adolescents with various psychiatric diagnoses.

CONCLUSION

Encouraged by the results from our pilot study and the interest from Swedish child and adolescent psychiatric teams, we conducted this second Swedish study on adolescents and dissociative symptoms. The DIS-Q, with a normative sample of adolescents, produces four factors that are similar in content to those with adults but differ from the adult factors in some of the specific items in each factor. The absorption subscale continues to stand out as having poor retest reliability, poor internal consistency, and too few items. Although its scores do appear to differentiate the clinical from normative groups, further adjustments and tests must be made before the Dis-Q-Sweden can be used as a screening tool for dissociation in clinical practice. Adolescent girls report higher levels of dissociation, but primarily only in middle adolescence, and girls with documented sexual or physical abuse report dissociation levels twice as great or greater than girls in the normative sample, consistent with findings in previous studies that abuse is associated with dissociation. Future studies are encouraged to evaluate the impact of socio-demographic variables and the usefulness of the Dis-Q-Sweden in other clinical populations. Even if this study is up to now the most extensive study investigating dissociation among adolescents using the Dis-Q-Sweden, our recommendation is to replicate the research with more participants to increase confidence about the factor structure and to establish the most suitable cut-off score for Dis-Q-Sweden in adolescents.

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