

Prototypic Features of Loneliness in a Stratified Sample of Adolescents

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Abstract

Dominant theoretical approaches in loneliness research emphasize the value of personality characteristics in explaining loneliness. The present study examines whether dysfunctional social strategies and attributions in lonely adolescents can be explained by personality characteristics. A questionnaire survey was conducted with 379 Danish Grade 8 students ($M = 14.1$ years, $SD = 0.4$) from 22 geographically stratified and randomly selected schools. Hierarchical linear regression analysis showed that network orientation, success expectation and avoidance in affiliative situations predicted loneliness independent of personality characteristics, demographics and social desirability. The study indicates that dysfunctional strategies and attributions in affiliative situations are directly related to loneliness in adolescence. These strategies and attributions may preclude lonely adolescents from guidance and intervention. Thus, professionals need to be knowledgeable about prototypic features of loneliness in addition to employing a pro-active approach when assisting adolescents who display prototypic features.

Keywords: Loneliness, adolescence, personality, social strategies

The identification of prototypic features of lonely people is of large importance to loneliness research (Heinrich & Gullone, 2006) and has the potential to guide optimal clinical intervention and planning of public prevention. The current study investigated, to what extent maladaptive strategies and attributions in affiliative situations are specific predictors of loneliness in adolescence, independent of personality characteristics.

Loneliness in adolescence

Available evidence suggests that loneliness increases during adolescence (Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006) and is most prevalent during the adolescent years (Heinrich & Gullone, 2006). Loneliness in adolescence may to some extent be considered normative, because of the significant changes in social expectations and needs that adolescents undergo (Sippola &

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Bukowski, 1999). However, it is important to distinguish between loneliness as a fundamental reality in human existence (Moustakas, 1961) and loneliness as a psychological reaction towards social deficiencies (Peplau & Perlman, 1982). On the one hand, existential feelings of loneliness may be a natural part of adolescent life and to some extent considered positive as a source of personal development. On the other hand, some adolescents are captured in a state of deep loneliness with serious consequences for well-being and mental health. To consider the latter normative and constructive would be wrong. In fact, many studies have associated adolescent loneliness with mental health problems, in particular depressive affect (Mahon et al., 2006).

Loneliness has been defined in different ways, but most scholars agree that loneliness is an unpleasant and distressing, subjective experience that results from deficient social relationships (Peplau & Perlman, 1982). The notion that loneliness is a subjective experience, and as such differs from solitude, is particularly important with regard to adolescents, who tend to be surrounded by peers, most commonly classmates. Thus, experiencing loneliness in adolescence often means feeling lonely in the crowd. In line with this observation, studies have shown that it is possible to feel lonely yet have many contacts. For instance, loneliness in undergraduate students does not predict differences in time spent alone and in daily activities (Hawkley, Burleson, Berntson, & Cacioppo, 2003) likewise such is not highly related to the objective characteristics of the social milieu (Jones, 1981).

Loneliness, personality, and dysfunctional strategies and attributions

One important consideration when describing loneliness is that of individual differences. Dominant theoretical approaches within the field all emphasize the value of personality characteristics in explaining the unpleasant experience of loneliness and the associated deficiencies in lonely persons' social relationships. Drawing on psychodynamic theory, the social needs approach (Fromm-Reichmann, 1959; Sullivan, 1953) argues that loneliness arises from an inability to establish fulfilling social relationships due to personality traits and intrapsychic conflicts. The aforementioned are assumed to be formed by early childhood experiences with parents who failed to satisfy the child's basic needs of human intimacy. The interactionist approach argues that loneliness arises from the interplay between personality factors (e.g.,

extraversion), cultural factors and situational factors (Weiss, 1973; Weiss, 1982). Both the social needs approach and the interactionist approach is related to Bowlby's (1969, 1973) attachment theory, which has inspired studies that have associated loneliness in adolescence and adulthood with disrupted or insecure attachment styles (DiTommaso, Brannen-McNulty, Ross, & Burgess, 2003; Hecht & Baum, 1984). Finally, the cognitive approach views loneliness as the result of a discrepancy between the interpersonal relationships, which one perceives they have, and the interpersonal relationships which one wishes to have (e.g., Peplau, Miceli, & Morasch, 1982). This approach additionally highlights low self-esteem and an internal, stable attributional style as predictors of loneliness.

The importance of personality characteristics in loneliness gains support from a wealth of studies. In line with other researchers (Asendorpf & van Aken, 2003), this study distinguished between stable core personality characteristics and less stable surface personality characteristics. Research, primarily conducted with North American college students, has repeatedly related two main core personality characteristics to loneliness: extraversion and neuroticism (Amichai-Hamburger & Ben-Artzi, 2003). Studies with adolescent samples that have investigated loneliness and the two personality components typically find effect sizes in the range of .09 to .25 (Asendorpf & van Aken, 2003; Neto & Barros, 2000; Wilson, Sibanda, Sibanda, & Wilson, 1989). Moreover, loneliness has been associated with general surface characteristics that are more susceptible to environmental influence, in particular low self-esteem. A meta-analysis of 30 adolescent samples (Mahon et al., 2006) indicated that the relationship between self-esteem and loneliness were in the range of a high medium effect size ($r^2 = .23$ to $.25$; outliers removed) within this age group.

Studies that compare the different impact of these personality characteristics on loneliness are rare and inconclusive. In an undergraduate study using multiple regression analysis both extraversion and neuroticism contributed significantly to loneliness, but the independent contribution of neuroticism was larger than that of extraversion ($r^2 = .18$. vs. $r^2 = .06$; Stokes, 1985). In contrast, extraversion and self-confidence (rather than neuroticism) predicted social loneliness

in an adolescent study (Cheng & Furnham, 2002). Accordingly, it is relevant to conduct further studies that compare the specific impact of different personality characteristics.

One important question that has been largely overlooked in previous research is to what extent the personality characteristics of lonely adolescents can explain associations with other related affective, cognitive, and behavioural features. One example is the common use of dysfunctional strategies and attributions in affiliative situations by lonely people. For instance, social avoidance, low network orientation, an internal, stable attributional style, and low success expectations and pessimism in affiliative situations, have been associated with loneliness (e.g., Johnson, LaVoie, Spenceri, & Mahoney-Wernli, 2001; Laine, 1998; Nurmi, Toivonen, Salmela-Aro, & Eronen, 1996; Van Buskirk & Duke, 1991; Vaux, 1988). To our knowledge, it has not been investigated whether such social strategies and attributions essentially reflect personality characteristics or, opposed to this, are independent prototypic features of loneliness in adolescence.

In a recent study (Cacioppo et al., 2006), negative mood, anxiety, anger, optimism, self-esteem, and social support were all associated with loneliness independent of the Big Five personality traits (including extraversion and neuroticism) in undergraduate students. However, in the same study, avoidant thinking, positive affect, fear of negative evaluation, and social skills, failed to be associated with loneliness when the personality variables served as covariates, indicating that the extent to which loneliness is functionally independent of personality may vary in relation to different affective, cognitive, and behavioural features.

Prototypic features of loneliness and gender

Studies have shown that males and females have different social needs and friendship structures (Inderbitzen-Pisaruk, Clark, & Solano, 1992). For instance, adolescent girls have more intimate friendships than boys. These findings suggest that there may be gender differences in the variables that are associated with adolescent loneliness. However, studies investigating gender differences in the prototypic features of lonely adolescents are not very common. Inderbitzen-Pisaruk et al. (1992) found that self-esteem, social skills, and non-interpersonal controllability

predicted loneliness in boys, whereas social anxiety, social skills, and interpersonal stability predicted loneliness in girls. Also, research has reported that male college students report a greater association between loneliness and negative self-perceived likeability than that reported by females (Schultz & Moore, 1986). Moreover, some studies suggest that there is a greater association between loneliness and distress (e.g., mild depression and psychosomatic complaints) among male than female adolescents (see Koenig & Abrams, 1999). However, studies that have investigated gender differences in the relationships between loneliness and extraversion and neuroticism have revealed inconclusive results (Saklofske, Yackulic, & Kelly, 1986; Saklofske & Yackulic, 1989).

The present study

Most studies of loneliness in adolescence have been based on convenience samples. In a recent meta-analytic study, 103 of 107 were samples of convenience (Mahon et al., 2006). Consequently, it is most likely that some parts of adolescent populations have been excluded or underrepresented in many existing studies, which to some extent limits generalization of the results. For instance, it is possible that the community studies have failed to include adolescents from rural areas attributable to their extended locality in relation to the research departments. Thus, stratified or population-based studies are needed. The present study investigated prototypic features of loneliness in a geographically stratified sample of Danish Grade 8 students.

Very few studies have investigated loneliness in samples from Denmark, a small country of approximately 5½ million citizens situated in the Scandinavian region of northern Europe. The country is highly secularised, has many dual-working families, a high divorce rate, and an extensive welfare system. Naturally, differences in interpersonal relationships and norms in various cultures may affect the degree and experience of loneliness. However, the patterns of factors (e.g., personality factors) that correlate with loneliness have been found to be similar across samples from diverse cultures (Anderson, 1999; Jones, Carpenter, & Quintana, 1985; Neto & Barros, 2003). Also, it has been indicated that there may be larger intracultural than cross-cultural differences in loneliness (DiTommaso, Brannen, & Burgess, 2005). Therefore, we expected that

prototypical features of lonely adolescents in Denmark would be similar to what have been observed in other countries.

As described, dominant theoretical approaches in loneliness research emphasize the value of personality characteristics in explaining loneliness. However, no previous studies have investigated whether the use of dysfunctional strategies and attributions in affiliative situations essentially reflect personality characteristics such as extraversion, neuroticism, and self-esteem, or, opposed to this, is a specific prototypic feature of loneliness. Assuming that personality characteristics are more general and stable variables than dysfunctional strategies and attributions in affiliative situations, the identification of a specific relationship between dysfunctional social strategies and attributions and loneliness in adolescence, could point towards prototypic features of loneliness that are domain specific and susceptible to clinical intervention.

In the present exploratory study, we aimed to assess the predictive validity of three such strategies and attributions (avoidance, success expectation, and network orientation) in explaining adolescent loneliness independent of three personality characteristics (extraversion, neuroticism, and self-esteem), social desirability and demographics. Given that studies investigating gender differences in the prototypic features of lonely adolescents are not very common, an additional purpose of the study was to investigate gender differences in the associations between loneliness and the investigated personality characteristics, strategies, and attributions. The personality characteristics included in the study were chosen because they consistently have been associated with loneliness, whereas the strategies and attributions in affiliative situations were chosen because they previously have been associated with loneliness. Given that loneliness is a very unpleasant feeling, it also seemed wise to control for social desirability that could influence the responses of participating adolescents.

Methods

Participants and Procedure

The data employed in this study was collected from a questionnaire survey with a stratified sample of 379 Grade 8 students. Grade 8 students were chosen as participants because of the fact

that the majority of the Danish adolescents of this year group partake in education in a public or private school (97% in 2005; Statistics Denmark, 2007a). Thus, it was possible to include a geographically representative sample of the target population in the study. Attributable to the narrow focus on Grade 8 students, the majority of the participants were 14 years old ($M = 14.1$; $SD = 0.4$; range = 13-17). Fifty-three percent were boys. The demographic characteristics of the sample can be seen in Table 1.

Table 1
Sample Characteristics ($N = 379$) versus National Characteristics from Statistics Denmark

Variables	Sample	National
	Characteristics (Mean or Percentage)	Characteristics (Mean or Percentage)
<i>Demographics</i>		
Age	14.1	14.1 ^a
Gender, boys	53	51 ^a
Country of birth, Denmark	94	95 ^a
Living conditions		
Two-parent family	71	64 ^b
Single-parent family	28	34
Other	1	2
Siblings		
Only child	6	5 ^b
One sibling	41	37
Two or more siblings	53	58
Type of education, public school	89	85 ^a
Residential location		
Rural area	26	
Village or small city (< 10,000 inhabitants)	24	
Large city (> 10,000 inhabitants)	50	

Note. The mixed category “living with other” was excluded from the analysis. ^aNational characteristics of Danish Grade 8 students (Statistics Denmark, 2007a; based on 2005-figures). ^b National

characteristics of 14-year-old persons in Denmark (Statistics Denmark, 2007b; based on 2005-figures).

The procedure followed that of a previous national study with Danish Grade 8 students (Elklit, 2002). The sample was geographically stratified, using the number of Grade 8 students in counties (Statistics Denmark, 2007a; based on 2005-figures) to define 10 different geographical areas of approximately equal size. From these 10 areas 39 randomly selected schools that taught Grade 8 students were approached. At the outset 30 schools (three from each area) were approached. However, three schools immediately declined to participate due to time constraints. Therefore, three additional randomly selected schools from the same areas as the declining schools were approached. Moreover, only one school from the capital area responded to the survey. Therefore, six additional randomly selected schools from this area were approached, with the aim of obtaining a more geographically representative distribution of the participants.

The study was introduced to the headmaster of the selected schools with the purpose of recruiting one randomly selected class from each school. If the selected school taught more than one Grade 8 class, headmasters were informed that as only one class would be needed from each school, one would be randomly selected for inclusion (the primacy of the initials of the class teacher decided the class). The class teacher received a letter describing the aim of the study, the procedure of the data collection, and confidentiality procedures. Therefore it was the onus of the class teacher to monitor all data collection. Due to the sensitive nature of the questionnaire, the importance of both confidentiality and support from the teacher was stressed.

Twenty-two of the 39 schools that were approached agreed to participate. Each class consisted of between 6 to 24 students ($M = 17.2$ students, $SD = 4.0$), on average 90% of the students were present on the day of the study. All students present participated in the study. The geographical spread of the participants was deemed satisfactory. Also, the sample characteristics were quite similar to national characteristics of Grade 8 students or 14-year-old persons in Denmark (see Table 1).

Measures

The first part of the questionnaire contained demographic questions about gender, age, birthplace, living conditions (living with both parents, single parent or others), number of siblings, and residential location (rural areas, villages or small cities [$< 10,000$ inhabitants], and large cities [$10,000-1,500,000$ inhabitants]).

Loneliness was assessed using the third version of UCLA (UCLA-3; Russell, 1996), which is the most frequently used standardized self-report scale for measuring loneliness in adolescent and adult populations (Hartshorne, 1993). The scale consists of 20 items (11 positive and 9 negative) and measures general feelings of loneliness, social isolation, and satisfaction or dissatisfaction with one's social interactions. Items are rated on a 4-point Likert scale according to the rate of frequency, ranging from 1 (*never*) to 4 (*always*) with higher scores reflecting higher loneliness. The scale has satisfactory psychometric properties (Russell, 1996). Using data from the present study, a translated/back-translated Danish version of the UCLA-3 showed high internal consistency ($\alpha = .92$; Lasgaard, 2007). Moreover, correlations between the UCLA and measures of loneliness, self-esteem, and depression, supported the convergent and discriminant validity of the scale (Lasgaard, 2007).

The questionnaire survey also included a number of other measures from which the following were selected: The subscales Extraversion and Neuroticism from the Eysenck Personality Questionnaire – Revised Short Scale (EPQ-RSS; Eysenck & Eysenck, 1991) were included to measure two well-established core personality traits. The scale was translated/back-translated into Danish. Each subscale comprises 12 statements scored “yes” or “no”, and a high score on a subscale indicates that the trait is dominant in the respondent. Both subscales showed good internal consistency in the study (Extraversion $\alpha = .83$; Neuroticism $\alpha = .84$).

The Rosenberg Self-Esteem Scale (SES; Rosenberg, 1965) was used to measure a general surface characteristic that has been associated with loneliness in many studies. The scale comprises 10 items, scored on a 4-point Likert scale; a high score on the scale reflects high self-

esteem. The SES has been translated into Danish by A. Elklit and showed good internal consistency in the present study ($\alpha = .88$).

Three strategies and attributions in affiliative situations were investigated in the study. The Strategy and Attribution Questionnaire (Nurmi, Salmela-Aro, & Haavisto, 1995) measures a broad range of strategies and attributions. In the present study, two subscales were used to measure Success Expectation and Avoidance in the affiliative context. The subscales were translated/back-translated into Danish. The Success Expectation subscale comprises four items, whereas the Avoidance subscale comprises six items. Both scales were scored on a 4-point Likert scale and a high score on the scales reflect high expectations of social success and high avoidance. The subscales showed satisfactory internal consistency in the present study (Success Expectation $\alpha = .74$; Avoidance $\alpha = .77$). The Network Orientation Scale (NOS; Vaux, Burda, & Stewart, 1986) was included to measure the willingness to make use of social support resources. The NOS comprises 20 items, scored on a 4-point Likert scale with higher score on the scale indicating poor network orientation. The scale was translated/back-translated into Danish. The NOS showed good internal consistency in the present study ($\alpha = .74$).

A 13-item short version (MC Form C; Reynolds, 1982) of the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960) was included to control for social desirability. The MC Form C, one of the best short versions in comparison with other abbreviated scales, correlates highly with the full-length instrument (Andrews & Meyer, 2003; Reynolds, 1982). The MC Form C is scored on a 2-point scale (true or false) with a high score indicating high social desirability and was translated/back-translated into Danish. The scale showed a modest, but acceptable internal consistency in the present study ($\alpha = .64$).

Data analysis

Hierarchical linear regression (HLR) was performed to evaluate to what extent the various independent measures predicted the score on the UCLA. HLR is a theoretically driven model for entering variables in the model rather than a statistically driven model such as a stepwise analysis.

In step 1 in the regression equation, the demographic variables (gender, country of birth, living with both parents vs. single parent, number of siblings, and residential location) were entered. Also, to control for biased responding, social desirability was included. Then, in step 2 the measures of personality characteristics were entered, followed in step 3 by the measures of attributions and strategies in affiliative situations. The rationale was that the general and more stable variables (in particular, extraversion and neuroticism) were entered before the variables that were specifically related to the affiliative domain. Finally, the HRL analysis was performed separately for boys and girls. Following the guidelines of Aiken and West (1991) we explored whether the associations between loneliness, and personality characteristics, and attributions and strategies in affiliative situations were moderated by gender. This was done by testing the equality of the regression coefficients for boys and girls (Fife-Schaw, 2006).

By examining tolerance and the Variance Inflation Factor all reported HLR models were checked for multicollinearity between independent variables. The analyses did not indicate problems with multicollinearity. Prior to data analysis, the data were screened for errors. The percentage of missing values was small (0.3-7.1%). The Expectation Maximization (EM) algorithm, which has been demonstrated to be an effective method of dealing with missing data (Bunting, Adamson, & Mulhall, 2002), was performed to impute missing data on all included scales. The EM algorithm is an iterative optimization method used for finding maximum likelihood estimates of unknown parameters in latent variables, given measurement data. Maximum likelihood estimation is based on the premise that the observed measures provide indirect information about the unobserved measures and is a common method of imputation. The Little's MCAR test (Little, 1988) was non-significant, which indicates that data was missing at random. Imputation of missing data was performed using SPSS 16.00.

Results

The zero-order correlations of the variables in the study can be seen in Table 2, whereas the results of the HLR analyses can be seen in Table 3. The first step of the HRA showed that the demographic factors and social desirability explained 4% of the variance. The only significant

predictor variable was social desirability, associated with less loneliness. In step 2 the relationship between loneliness and the three personality variables were examined. Replicating prior research, neuroticism was associated with more loneliness, whereas extraversion and self-esteem were associated with less loneliness. The model explained 52% of the variance. Including the measures of attributions and strategies in affiliative situations in step 3, success expectation, avoidance and network orientation proved to be significant predictors of loneliness independent of the personality characteristics, demographics, and social desirability. Moreover, the three personality characteristics remained significant predictors of loneliness. The expanded model explained 61% of the variance in loneliness ($R^2 = 8\%$, $p < .005$). The semipartial correlations squared that indicate the effect size contribution of each variable independently of the other variables can be seen in Table 3.

Table 2

Means, SDs and Intercorrelations of the Variables in the Study

Measure	1	2	3	4	5	6	7	8
1. Loneliness	-	-.53***	.57***	-.55***	-.64***	.63***	.52***	-.15**
2. Extraversion		-	-.36***	.30***	.43***	-.61***	-.35***	.03
3. Neuroticism			-	-.60***	-.47***	.46***	.32***	-.29***
4. Self-esteem				-	.55***	-.46***	-.41***	.19***
5. Success expectation					-	-.64***	-.49***	.17**
6. Avoidance						-	.42***	.01
7. Low network orientation							-	-.21***
8. Social desirability								-
Mean (SD)	37.63 (10.12)	20.69 (3.00)	16.11 (3.34)	31.50 (5.40)	13.13 (1.98)	11.65 (3.22)	43.79 (6.00)	19.92 (2.71)

Note. * $p < .05$. ** $p < .005$. *** $p < .0005$.

Table 3

Hierarchical Regression Analysis for Variables Predicting Loneliness (N = 379)

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>	r_{sp}^2
Step 1						
Gender	-0.25	1.05	-.01	-0.24	.812	.00
Country of birth, Denmark	-1.14	2.13	-.03	-0.54	.592	.00
Two-parent family	-1.89	1.15	-.09	-1.64	.103	.01
Number of siblings	-0.03	0.87	.00	-0.04	.971	.00
Residential location	-0.84	0.63	-.07	-1.34	.182	.00
Social desirability	-0.58	0.19	-.15	3.00	.003**	.02
Step 2						
Gender	-2.46	0.78	-.12	-3.14	.002**	.01
Country of birth, Denmark	-1.63	1.52	-.04	-1.07	.284	.00
Two-parent family	0.12	0.83	-.00	0.01	.989	.00
Number of siblings	-0.33	0.62	-.02	-0.53	.594	.00
Residential location	-0.19	0.45	-.02	-0.42	.679	.00
Social desirability	-0.04	0.15	-.01	-0.27	.786	.00
Extraversion	-1.07	0.14	-.32	-7.80	< .0005***	.08
Neuroticism	0.96	0.15	.31	6.25	< .0005***	.05

(table continues)

Table 3 continued

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>P</i>	r^2_{sp}
Self-esteem	-0.55	0.09	-.30	-6.40	< .0005***	.05
Step 3						
Gender	-0.89	0.74	-.04	-1.20	.230	.00
Country of birth, Denmark	-0.95	1.38	-.02	-0.69	.492	.00
Two-parent family	0.04	0.75	.00	0.05	.958	.00
Number of siblings	-0.33	0.56	-.02	-0.58	.562	.00
Residential location	-0.10	0.41	.01	0.23	.819	.00
Social desirability	0.03	0.14	.01	0.22	.828	.00
Extraversion	-0.52	0.15	-.15	-3.58	< .0005***	.01
Neuroticism	0.71	0.14	.23	5.02	< .0005***	.03
Self-esteem	-0.23	0.09	-.12	-2.63	.009**	.01
Success expectation	-1.08	0.25	-.21	-4.31	< .0005***	-.02
Avoidance	0.53	0.16	.17	3.24	.001**	.01
Low network orientation	0.27	0.07	.16	3.96	< .0005***	.02

Note. $R^2 = .04$ for Step 1 ($p < .05$); $R^2 = .48$ for Step 2 ($p < .0005$); $R^2 = .09$ for Step 3 ($p < .0005$).

$p < .05$. ** $p < .005$. *** $p < .0005$.

The result of the full HRL analysis performed separately for boys and girls can be seen Table 4 (for simplicity, proceeding steps are not shown). Extraversion, neuroticism, success expectation, social avoidance, and network orientation, were significant predictors of loneliness in both boys and girls. Self-esteem predicted loneliness in boys only. However, testing the equality of the regression coefficients for boys and girls, no significant gender differences emerged with regard to any of six the variables. Both models were highly significant and explained 58% of the variance in loneliness in boys, and 66% of the variance in loneliness in girls.

Table 4

Hierarchical Regression Analysis for Variables Predicting Loneliness in Boys and Girls^a

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>	r^2_{sp}
Boys (<i>n</i> = 199)						
Step 3						
Country of birth, Denmark	-2.87	2.10	-.07	-1.37	.173	.00
Two-parent family	-0.10	1.15	.00	-0.09	.931	.00
Number of siblings	-0.35	0.79	-.02	-0.44	.658	.00
Residential location	-0.05	0.61	.00	-0.08	.934	.00
Social desirability	-0.20	0.19	-.05	-1.04	.302	.00
Extraversion	-0.51	0.20	-.16	-2.52	.013*	.01
Neuroticism	0.67	0.21	.20	3.14	.002**	.02
Self-esteem	-0.26	0.12	-.13	-2.11	.036*	.01
Success expectation	-1.23	0.35	-.25	-3.54	.001**	.03
Avoidance	0.45	0.22	.15	2.05	.042*	.01
Low network orientation	0.21	0.10	.12	2.06	.041*	.01
Girls (<i>n</i> = 180)						
Step 3						
Country of birth, Denmark	0.57	1.87	.01	0.30	.762	.00

(table continues)

Table 4 continued

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>P</i>	r^2_{sp}
Two-parent family	0.39	1.03	.02	0.38	.702	.00
Number of siblings	-0.34	0.81	-.02	-0.41	.680	.00
Residential location	0.39	0.57	.03	0.68	.501	.00
Social desirability	0.28	0.19	.08	1.46	.147	.00
Extraversion	-0.60	0.22	-.16	-2.74	.007*	.12
Neuroticism	0.73	0.20	.25	3.66	< .0005***	.03
Self-esteem	-0.21	0.13	-.11	-1.62	.107	.00
Success expectation	-0.82	0.39	-.15	-2.09	.038*	.01
Avoidance	0.63	0.25	.19	2.49	.014*	.01
Low network orientation	0.35	0.10	.21	3.70	< .0005***	.03

Note.^a For simplicity, only the full model (step 3) is shown.

$R^2 = .04$ for Step 1 in boys; $\cdot R^2 = .45$ for Step 2 in boys ($p < .0005$); $\cdot R^2 = .08$ for Step 3 in boys ($p < .0005$). $R^2 = .03$ for Step 1 in girls; $\cdot R^2 = .53$ for Step 2 in girls ($p < .0005$); $\cdot R^2 = .10$ for Step 3 in girls ($p < .0005$).

* $p < .05$. ** $p < .005$. *** $p < .0005$.

Discussion

Theoretical analyses have stressed the importance of personality in loneliness, and consistent with the results of previous research, the present study established that loneliness was positively related to neuroticism and negatively related to extraversion and self-esteem (independent of demographics and social desirability). In fact, the three personality characteristics explained more than half of the variance in loneliness, signifying the relevance of investigating the relationship between loneliness and personality. The effect sizes of the three factors were similar ($r^2_{sp} = .05$ -.08, all $p < .005$). This finding differs from previous studies, where the independent contribution of the factors has differed substantially (Cheng & Furnham, 2002; Stokes, 1985).

However, none of the previous studies investigated exactly the same combination of factors, and only the present study controlled for demographic factors and social desirability.

More importantly, when including avoidance, success expectation, and network orientation in the model, avoidance and low network orientation were significantly associated with more loneliness, whereas success expectations were associated with less loneliness. Hence, the three personality characteristics did not explain the associations between adolescent loneliness and avoidance, success expectation, and network orientation. The finding indicates that dysfunctional strategies and attributions in affiliative situations are specific prototypic features of loneliness in adolescence and the inclusion of the three factors raised the explained variance with 9 %.

As mentioned, the study indicates that a low expectation of future social success is a specific predictor of loneliness. However, one could speculate that success expectation in affiliative situations partly reflects a cognitive dimension of general self-esteem that often is part of a package of beliefs and behaviours that interfere with initiating or maintaining satisfying social relationships (Peplau et al., 1982). Adolescents who feel useless and show little self-confidence are likely to take little social initiative and will often be perceived by other adolescents as an unattractive peer, further increasing the risk of social deprivation. Feelings of loneliness may also have a negative effect on self-esteem that is often based on perceptions of personal experiences and feedback from significant others (Meggert, 1989). Without friends adolescents may feel alone in the search for their identity, and repeated experiences of rejection or a general lack of interest from peers in this critical development period may confirm a negative self-image, decrease success expectations, and increase feelings of uselessness. In that sense, the relationship between loneliness and low success expectation as well as self-esteem is likely to be bi-directional (Peplau et al., 1982).

At first, it would appear that the relationship between loneliness and avoidance of social situations is a contradiction. Given that loneliness is a reaction towards social deficiencies, it may seem odd that lonely adolescents tend to avoid situations that could lead to the initiation of satisfying peer relationships. However, lonely adolescents probably shun social situations due to anxiety related to such. This does not, however, imply that these adolescents do not long to

engage with a peer group. As such, the avoidance of social situations in lonely adolescents may be regarded as a symptom of social anxiety, linked with loneliness in previous research (Johnson et al., 2001).

Research has repeatedly related social support to loneliness (Mahon et al., 2006). However, the specific relationship between loneliness and a poor network orientation in the present study stresses the importance of individual differences in the willingness and ability to use social support resources. Although some lonely adolescents presumably do lack social support, others seem to find it inadvisable to draw on a network and therefore may not reach out for help when it is available. Future research may further investigate the relationship between loneliness, perceived social support, and the use of support resources.

As mentioned above, the three personality characteristics remained significant predictors of loneliness when including the strategies and attributions in affiliative situations in the model. However, the independent contribution of the three factors was reduced. Noteworthy, the effect of extraversion on loneliness was diminished by more than half. Extraversion is associated with a greater need for stimulation due to a lower level of cortical arousal, which might manifest itself in behaviours that increase the extent of social contacts, and thereby in turn reduce the likelihood of experiencing loneliness (Saklofske & Yackulic, 1989). In undergraduate students, the relationship between extraversion and loneliness has been found to be mediated by social network variables, indicating that extraverts are less lonely because they have large networks (Stokes, 1985). In line with this finding, the investigated strategies and attributions (e.g., avoidance) could be likely to have a negative impact on the actual social network, which may explain why the inclusion of these factors reduced the effect of extraversion.

In contrast, neuroticism was the strongest predictor of loneliness in the expanded model, indicating that neuroticism is an important prototypic feature of loneliness in adolescence. The predictive value of neuroticism may be explained by the trait being associated with a sensitive and worrying approach to relational deficits and a limited capacity to enjoy satisfying relationships (Saklofske et al., 1986). In line with this suggestion, neuroticism has been shown to predict

loneliness independent of social network variables in undergraduate students, indicating that loneliness and neuroticism are related at the cognitive rather than the behavioural level (Stokes, 1985).

Given that the relation between self-esteem and loneliness in adolescence has been reported to be in the range of a high-medium effect size (Mahon et al., 2006), it is also noteworthy that the inclusion of the strategy and attribution variables in the model diminished the effect of self-esteem by more than half. Possibly, the relationship between self-esteem and loneliness is mediated by the strategies and attributions that people apply in social situations, as indicated by a study of undergraduate students (Nurmi, Toivonen, Salmela-Aro, & Eronen, 1997).

Previous studies have associated self-esteem and self-perceived likeability with loneliness in boys (Inderbitzen-Pisaruk et al., 1992; Schultz & Moore, 1986). Similarly, the HRL analysis performed separately for boys and girls indicated that self-esteem predicted loneliness in boys only. However, the association between self-esteem and loneliness was not significantly moderated by gender. Likewise, no gender differences emerged with regard to the other five predictors of loneliness variables. This finding differs from previous studies that have pointed to the existence of different gender difference and may be explained by methodological differences between the studies in regard to the performed data analysis and the level of representativeness of the samples.

Additionally, loneliness was not predicted by any demographic variables in the full model, which is in line with previous studies that have found psychosocial factors to be more predictive of loneliness than demographic variables (Neto & Barros, 2000; Uruk & Demir, 2003). Finally, social desirability only seemed to have a limited influence on the responses of the participating adolescents as indicated by the small correlations between social desirability and the other investigated psychosocial variables ($r = .01-.29$).

As expected, the pattern of associations between loneliness and personality characteristics, social strategies and attributions, and demographics were generally consistent with previous studies, indicating that the prototypical features of lonely adolescents in Denmark are not unique to the investigated Danish adolescent sample, but are in fact similar to what have been observed in other countries.

Implications for practice

Earlier research has found that lonely people attribute their interpersonal failures and loneliness to personal and hardly changeable characteristics such as personality traits rather than situational or changeable characteristics such as strategies chosen (see Heinrich & Gullone, 2006). However, the present study indicates that dysfunctional social strategies and attributions in affiliative situations are directly related to loneliness. This finding clearly indicates that school interventions and counselling may benefit from focusing on social strategies and attributions, for instance, by developing programs that may help lonely adolescents change their tendency to avoid social situations. So far, social skills training have proved to be an effective intervention against loneliness (Adams, Openshaw, Bennion, & Mills, 1988; King, Specht, Schultz, & Warr-Leeper, 1997).

The specific associations between adolescent loneliness and low network orientation and avoidance of social situations underlines the notion that lonely adolescents will often be resistant to seek help and acknowledge to others that they need assistance. Therefore, they may be likely to hide and be overlooked in the classroom and other social arenas, which preclude them from guidance and intervention. In consequence, clinicians, counsellors, teachers, and social workers need to be knowledgeable about the lonely prototype in addition to employing a pro-active approach when assisting adolescents who display prototypic features.

Limitations

The present study has some limitations and caution must be exercised when interpreting the findings. The sample comprised only 379 students from 10 areas, which does not allow precise estimates of the population parameters. Also, the comparison between sample characteristics and national characteristics is a very simple analysis, which is why caution must be exercised with regard to generalization of the findings. Nevertheless, we suppose that the geographical stratification and random selection of the invited schools and classes strengthen the

generalisability of the results of the present study in comparison with studies based on convenience samples.

Also, the present study was exploratory rather than driven by theory. This is a clear limitation and future studies would benefit from testing a theoretical model of the relationship between personality characteristics and social strategies and attributions. Additionally, more personality factors (e.g., the Big Five personality traits) and more strategies and attributions in affiliative situations could have been included. Finally, the correlational nature of the study does not allow conclusions about causality.

Nonetheless, the study demonstrated that three personality characteristics (extraversion, neuroticism, and self-esteem), which have been repeatedly related to loneliness, did not explain the use of dysfunctional social strategies and attributions in lonely adolescents. This finding points to the potential of interventions targeting the social strategies and attributions of lonely adolescents.

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