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ABSTRACT

This study investigated the relation of loneliness in middle childhood to behavioral, sociometric, and attributional measures of social functioning. Data for 128 third- through sixth-graders were collected on three occasions during a 1-year span. Teachers completed a rating scale assessing students' social behavior. Children's peer acceptance was assessed using a sociometric rating scale; causal attributions for social rebuke were collected from each child using vignettes; and children's loneliness was assessed using the adapted Asher et al. (1984) loneliness measure. Results indicated that concurrent loneliness was related to withdrawn social behavior, poor peer acceptance, few or no friendships, and an internal-stable attributional style. After prior loneliness was controlled for, no other measures of social functioning predicted loneliness at 10 weeks, but sociometric and attributional measures predicted loneliness at 40 weeks. Loneliness also predicted changes in later social functioning. Analyses indicated that children without friends were lonelier than children with friends, and as time passed, friendless children became more lonely. Findings suggest that loneliness in middle childhood is a stable phenomenon. A list of 31 references is included. (BC)

Loneliness in Middle Childhood: Concurrent and Longitudinal Predictors.

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Abstract

Concurrent and longer-term loneliness in middle childhood was investigated in relation to behavioral, sociometric, and attributional measures of social functioning. Data were collected across a one year time-span on three occasions from 128 third- through sixth-graders. Results were consistent with an exacerbatory model of loneliness - concurrent loneliness was related to withdrawn social behavior, poor peer acceptance, few or no friendships, and an internal-stable attributional style. After controlling for prior loneliness, none of the other measures of social functioning predicted loneliness over a short time-span (10 weeks), but over a longer time-span (40 weeks) sociometric and attributional measures did predict children's loneliness. Loneliness also predicted changes in later social functioning. Subgroup analyses indicated that children who remained without friends were more lonely than children with friends, and across time the friendless children became more lonely. Taken together, the findings suggest that loneliness in middle childhood is a surprisingly stable phenomenon that is located in a web of interrelated aspects of social functioning.

Loneliness in Middle Childhood: Concurrent and Longitudinal Predictors.

Children as well as adults associate loneliness with unpleasant emotions, perceptions of social relationship deficits, and an appreciation that loneliness can be triggered by situational factors (Hayden, Tarulli, & Hymel, 1988). Although certain behavioral, sociometric, and attributional characteristics have been associated with loneliness in middle childhood (Asher, Parkhurst, Hymel, & Williams, 1990), most research has documented the concurrent relations between these characteristics and loneliness. Very little is known about the importance of these characteristics as longitudinal predictors of loneliness or alternatively the relative importance of loneliness as a longitudinal predictor of the social characteristics.

Asher et al. (1990) proposed an exacerbatory model of loneliness in which various aspects of social functioning combine to predict increasing levels of loneliness, specifically withdrawn behavior, low peer status, few or no friendships, and an internal-stable attribution style. Two lines of research, one examining rejected subgroups of children and the other attributional patterns of low-status children, provide partial support for the model. Williams and Asher (1987) examined whether aggressive and withdrawn subgroups of peer-rejected children differed in their loneliness and social dissatisfaction. Their study indicated that withdrawn-rejected children were most disliked by peers, had the fewest best friends, and reported the highest levels of loneliness. Similar results have been obtained by Boivin, Thomassin, and Alain (1988) and Parkhurst and Asher (1989), suggesting that it may be the combination of withdrawn behavior, dislike by peers, and few or no friendships which is associated with particularly high levels of loneliness and social dissatisfaction.

In light of research with adults which shows that lonely adults tend to attribute social failure to stable-internal circumstances (Anderson, Horowitz, & French, 1983; Peplau, Miceli, & Morasch, 1982; Peplau, Russell, & Heim, 1979) and findings from the childhood literature which indicate that unpopular children tend to blame themselves for social failure (Goetz & Dweck, 1980; Sobol & Earn, 1985), researchers have also examined the relation between causal attributions, peer acceptance, and loneliness. Again, consistent with an exacerbatory model of loneliness, this research indicates that children who are unpopular with their peers and who attribute social rebuke to internal-stable causes tend to have the highest levels of loneliness and social dissatisfaction (Bukowski & Ferber, 1987).

A step towards identifying potential antecedents of childhood loneliness is evident in the work of Hymel, Rubin, Rowden, and LeMare (1990) who examined the longitudinal prediction of internalizing (e.g., loneliness) and externalizing (e.g., aggression) problems from middle to late childhood. They found that peer assessments of isolate social behavior, unpopularity, and self-perceptions of social incompetence were correlated with later internalizing problems. Based on these findings and the research reviewed above, in the present study we expected behavioral, sociometric, and attributional indices of social functioning to contribute cumulatively to the prediction of later loneliness.

Conceptualizations of causality in nonexperimental research have highlighted the importance of examining differential time-lags in order to avoid biased estimates of effect sizes and potentially misleading conclusions (James, Mulaik, & Brett, 1982; Gollob & Reichardt, 1987). According to Gollob and Reichardt (1987), such problems can arise if investigators fail to take into account the following three principles: that values of a variable can only be caused by values of prior variables; that values of a variable can be caused by prior values of the same variable; and that effect sizes can vary as a function of the length of the time-lag between a cause and the time for which its effect is assessed. These points take on added significance when it is considered that research on childhood loneliness has yet to examine whether measures of social functioning remain predictive of loneliness, after adjusting for the effects of prior loneliness. For example, in the Hymel et al. (1990) study, initial loneliness scores were not collected. As children's feelings of loneliness and social dissatisfaction are known to be stable over time (Hymel & Franke, 1985; Hymel et al., 1983), it is possible that the predictive relations reported would not be significant after the effects of prior loneliness had been taken into account.

In addition to controlling for the prior effects of loneliness, in the present study we collected initial information about social functioning (Time 1) and subsequent information ten-weeks (Time 2), and one-year later (Time 3), to examine the importance of differential

time-lags. Finally, we examined whether there was support for alternative directions of effect among the study variables, that is, whether loneliness is not only predicted by, but is predictive of later social functioning. One reason for proposing an alternative direction of effect is that social dysfunctioning may both precede and follow experiences of loneliness (Rubin, LeMare, & Lollis, 1990). For example, it may be that lonely children interpret the behavior of their peers in a negative and self-blaming manner that in turn influences their interaction with peers, and leads them to become marginal group members. This cycle may prove difficult to change and over time may result in children experiencing even more aversive peer interactions and heightened loneliness (Asher et al., 1990). A second reason for examining the alternative direction of effect is that measures of loneliness may not only be sensitive to existing difficulties children face in their peer relationships but may also be sensitive to future disruption of these relationships. For example, it is conceivable that a child may have several friends but still report moderate feelings of loneliness and social dissatisfaction because the friendships are not particularly supportive, or the child would prefer to have a different set of friends, or because of emerging difficulties within the friendship. If not resolved these problems may lead to the disruption of the child's existing network of friends. Thus, initial levels of loneliness and social dissatisfaction may in the short-term highlight potential difficulties that children face in their peer relationships, and over time, may forecast the disruption of the children's peer relationships.

In summary, the present study examined the concurrent and predictive correlates of loneliness within a longitudinal design involving a ten week and year-long time-lag. The measures of social functioning included sociometric measures (friendship and acceptance) behavior (withdrawn and aggressive) and causal attributions for social rebuke.

Method

Subjects

Participants were one hundred twenty-eight children (66 males, 62 females) from third- through sixth-grade classrooms in an elementary school in Perth, Western Australia. The children came from white, middle-class families. Data were collected for the sample on three occasions: at the beginning of the second school term, which was in early May (Time 1), ten weeks later (Time 2), and one year after the first assessment (Time 3). Measures were administered in counterbalanced order in each class during one session by the first author. Children took about 30-40 minutes to complete the sociometric, attributional, and loneliness measures. While they were doing so, teachers completed the social behavior rating scale.

Measures

Teacher assessment of social behavior. Each classroom teacher completed an eight-item rating scale for each study child. Two dimensions of peer-related social behavior were assessed - withdrawal and aggression. High scores on withdrawal indicated high ratings for "ignores other children", and "shies away from other children", and low ratings for "participation in peer activities", and "leadership in peer activities". High scores on aggression indicated high ratings on "bossiness" and "aggressiveness", and low ratings for "compliance" and "cooperativeness". Ratings for each item (from one [never] to five [very often]) were standardized to account for individual differences in teachers' use of the scale and summed to form scores for withdrawn and aggressive social behavior. Retest-stability correlations were moderately high for the individual social behavior items (total sample: correlation coefficients = .79 to .60) and the two social behavior dimensions (see Table 1).[1] Correlations between the two dimensions were low in magnitude.

Prior to calculating the withdrawn and aggressive composite scores, a series of factor analyses (quartimax rotation, eigen values>1) were conducted in order to determine whether two dimensions of social behavior were represented in the checklist, and whether items consistently loaded on the dimension they were thought to represent. For each assessment occasion, the same two-factor solution was found. Items corresponding to the withdrawn dimension loaded on one factor (Time 1 eigen value = 3.18, factor loadings = .84 to .70; Time 2 eigen value = 2.08, factor loadings = .77 to .64) and items corresponding to the aggressive dimension loaded on the other factor (Time 1 eigen value = 2.36, factor loadings = .88 to .73; Time 2 eigen value = 3.17, factor loadings = .87 to .69). In addition, both dimensions were found to be internally consistent (Cronbach's alpha exceeded .78 for each dimension at Time 1 and Time 2).

Sociometric assessment. Children's peer acceptance was assessed using a rating-scale sociometric. Children indicated on a scale ranging from one ("Not at all") to five ("Very much") whether they liked playing with each class member at school. An average play-rating received from same-sex peers within each classroom was calculated and scores were standardized. Friendship nominations were obtained by asking children to designate up to three best friends in their class. Friendship scores were created by summing the number of same-sex nominations received by each child and standardizing within classrooms. In general, retest-stability correlations for both sociometric measures were high (see Table 1). Friendship nominations, however, were not stable over the one year interval indicating the changeable nature of same-sex friendships across the transition from one school year to the next. Correlations between peer acceptance and friendship nominations at each of the assessment periods were moderate in magnitude.

Causal attributions for social rebuke. Causal attributions for social rebuke were collected from each child using two vignettes adapted from Goetz and Dweck (1980). Each vignette described a situation that was ambiguous but could be interpreted as an instance of rejection by peers. The vignettes were: (a) Suppose a friend stops playing with you. Why would this happen to you? (b) Suppose someone in your class keeps away from you all the time. Why would this happen to you? Using a typology similar to Hymel et al. (1983), four choices were prescribed for each vignette that varied along the dimensions of internality-externality and stability-instability. Children's ranking of the four attributions were combined across the two vignettes and yielded scores for each attributional choice that could vary from 2 to 8. Scores for internal-stable attributions and external-stable attributions are reported in the analyses below. These two scores provide evidence of a child's tendency to blame the self (internal-stable attributions) or the other (external-stable attributions) for the apparent social rebuke rather than momentary and unstable circumstances. As indicated in Table 1, retest-stability correlations were low to moderate in magnitude for each of these attributions. Correlations between the attributions were low to moderate in magnitude.

School-related loneliness. The Asher and Wheeler (1985) adaptation of the Asher et al. (1984) loneliness measure was employed to assess children's loneliness. The measure consists of 16 primary items which focus on feelings of loneliness and social dissatisfaction at school (e.g., "I am lonely at school", "I have nobody to talk to in class") and 8 filler items which focus on hobbies and interests. Children indicated how true each item was for them on a scale from 1 ("That's always true about me") to 5 ("That's not true about me"). Scores can range from a low of 16 to a high of 80, with higher scores indicating greater feelings of loneliness. Children's reported loneliness was stable over time (see Table 1).

Results

Preliminary analyses: Effects of sex, grade, and time on measures of social functioning and loneliness. A series of three-way multivariate analyses of variance were conducted separately for the behavioral (aggressive and withdrawn behavior), sociometric (peer acceptance and friendship), and attributional data sets (internal-stable and external-stable attributions). In each analysis, sex and grade were the between-subjects measures and time of testing was the within-subjects measure. The analysis of the behavioral dimensions yielded a significant multivariate effect for sex, $F(2,107) = 3.91$, $p<.05$, and for the interaction of sex and time, $F(2,228) = 8.07$, $p<.001$. Follow-up analyses indicated that boys were rated by their teachers as significantly more aggressive than girls, $F(1,126) = 11.47$, $p<.001$, girls were rated by their teachers as significantly more withdrawn than boys at the second assessment occasion, $F(1,126) = 9.30$, $p<.01$, and girls were rated as significantly more withdrawn at the second assessment occasion than the first assessment occasion, $t(61) = 2.68$, $p<.01$. No significant main or interaction effects were found for the sociometric or attributional measures. Finally, a three-way ANOVA (sex x grade x time of testing) with repeated measures across the third factor revealed no significant main or interaction effects for loneliness.

Concurrent correlates of loneliness. Concurrent correlations between measures of social functioning and loneliness at each assessment occasion are presented in Table 1. The pattern of correlations indicates that at Time 1 loneliness was positively correlated with withdrawn social behavior and internal-stable attributions for social rebuke, and negatively correlated

with peer acceptance and friendship nominations. At Time 2 and Time 3, this pattern of relations was reproduced with one exception. At Time 3, loneliness was negatively correlated with external-stable attributions. That is, children who were likely to attribute social rebuke to external-stable circumstances were less lonely.

Insert Table 1 about here

Regression analyses: Concurrent predictors. To examine the importance of the measures of social functioning as predictors of loneliness, concurrent regression analyses were employed. In these analyses concurrent measures of social functioning were used to predict loneliness, after adjusting for the effects of prior loneliness (Gollob & Reichardt, 1987).

Regression analyses were conducted in the following manner. For the second and third assessment occasions, loneliness scores from the prior assessment occasion, sex, and grade were entered initially to control for their effects on subsequent predictors. Then concurrent measures of social functioning were entered as sets (i.e., the social behavior set, the sociometric set, and the attribution set) on successive steps of the analysis (Cohen & Cohen, 1983). Univariate tests were employed only if the respective set accounted for significant additional variance in partialed loneliness. Finally, a multiplicative interaction term (sex x social functioning index) was alternately entered on the final step of each analysis (Biddle & Marlin, 1987; Cohen & Cohen, 1983).

In the absence of an articulated causal model of loneliness, the following rationale was used for the ordering of the independent variables. The observable and external measures of social functioning (behavioral and sociometric measures) were entered in the regression analysis followed by the more internal measure of social functioning (attributions). This ordering is consistent with evidence that internalizing problems follow social behavioral and peer relation difficulties (Hymel et al., 1990; Rubin et al., 1990). Results for the regression analyses are presented in Table 2. Unless significant, interaction terms are not reported.

The regression analysis at Time 2 shows that the indices of social functioning are predictive of concurrent feelings of loneliness and social dissatisfaction. After controlling for Time 1 loneliness, additional significant variance in Time 2 loneliness was attributable to the set of Time 2 social behavior indices (4%), the set of Time 2 sociometric indices (6%), and the set of Time 2 attribution indices (3%). Univariate analyses indicated that withdrawn social behavior, low peer acceptance, few friendship nominations, and internal-stable attributions for social rebuke were predictive of greater loneliness.[2] With regard the third assessment occasion, results replicated those found at Time 2 (see Table 2).

Insert Table 2 about here

Correlates of later loneliness. The pattern of correlations between measures of social functioning and later loneliness (see Table 1) indicated that more loneliness at Time 2 was associated with the following Time 1 measures: lower peer acceptance, fewer friendship nominations, more withdrawn social behavior, and an internal-stable attribution style. In examining the relation between Time 3 loneliness and Time 2 measures of social functioning, the same pattern of correlations was found.

Regression analyses: Longitudinal predictors. To examine the importance of the measures of social functioning as predictors of later loneliness, prospective regression analyses were used. In these analyses prior measures of social functioning were used to predict later loneliness, after adjusting for the effects of prior loneliness. Prospective analyses provide a stringent test of the relationships between variables because they take into account autoregressive effects and assume that variables take time to exert their influence (Gollob & Reichardt, 1987).

Regression analyses were conducted in the same manner as outlined for the concurrent analyses with the exception that prior measures of social functioning served as predictors of subsequent loneliness after controlling for prior loneliness. After partialing out Time 1 loneliness none of the Time 1 indices of social functioning were predictive of Time 2 loneliness (see Table 3). With regard the third assessment occasion, prospective analyses indicated that after controlling for Time 2 loneliness, the set of Time 2 sociometric indices and the set of Time 2 attribution indices accounted for an additional 10% of the partialed variance in Time 3 loneliness. Univariate analyses indicated

that poorer peer acceptance, fewer friendship nominations, and a reduced tendency to attribute peer rebuke to external-stable attributions predicted greater loneliness over the forty-week interval.

Alternative directions of effect. To examine alternative directions of effect among the variables, prospective regression analyses were employed. In these analyses we examined whether Time 1 loneliness was predictive of Time 2 measures of social functioning, and whether Time 2 loneliness was predictive of Time 3 measures of social functioning. To account for autoregressive effects in each analysis, scores for the prior measure of social functioning were entered on the first step of each analysis followed by scores for sex and grade. Results are presented in Table 3.

After controlling for the Time 1 measures of social functioning, sex and grade, Time 1 loneliness predicted more withdrawn social behavior and fewer friendship nominations over the ten-week interval. With regard Time 3 (the forty-week interval), after controlling for the Time 2 measures of social functioning, Time 2 loneliness predicted lower peer acceptance, a greater tendency to attribute social rejection to internal-stable circumstances, and a reduced tendency to attribute social rejection to external-stable circumstances.

Insert Table 3 about here

Friendship and loneliness. It has been claimed that at least one friendship may be of sufficient adaptive value to prevent children from experiencing extreme feelings of loneliness and social dissatisfaction (Asher et al., 1984; Asher et al., 1990). Although the correlational and regression analyses indicate that loneliness is associated with fewer friendship nominations, these analyses do not directly address the issue. To determine whether there was support for this view, a one-way ANOVA was conducted for each assessment occasion, with friendship subgroup (No friends, One friend, and Two or more friends) as the between-subjects measure. Each of the analyses showed a significant effect for friendship nominations (see Table 4 for means and standard deviations). Newman-Keuls planned comparisons indicated that at Time 1 children with no friends and children with one friendship nomination were significantly more lonely than children with two or more friendship nominations. For the second and third assessment occasions, children with no friendship nominations were significantly more lonely than children with one friendship nomination, who in turn were significantly more lonely than children with two or more friendship nominations.

Insert Table 4 about here

Maintaining friends and loneliness. To explore further the relationship between friendship and loneliness, the effect of friendship maintenance on loneliness and social dissatisfaction was examined. For this analysis we identified three subgroups of children: friendless maintainers - children who maintained their friendless status across time; single-friend maintainers - children who maintained a single friendship across time; and multiple-friend maintainers - children who maintained two or more friendships across time. A two-factor ANOVA (subgroup x time of testing) with repeated measures across the second factor revealed a significant effect for subgroup, $F(2,96) = 44.03$, $p<.001$, and for the interaction of subgroup x time, $F(4,192) = 2.55$, $p<.05$. Newman-Keuls post-hoc comparisons indicated that for each assessment occasion, friendless-maintainers were significantly more lonely than single-maintainers who in turn were significantly more lonely than multiple-maintainers (means and standard deviations are presented in Table 5). In addition, friendless-maintainers became more lonely over the forty-week interval, $t(8) = 2.73$, $p < .05$, whereas multiple-maintainers became less lonely over the forty-week interval, $t(71) = 2.14$, $p < .05$.[3]

Insert Table 5 about here

Discussion

The results of the present study suggest that the experience of loneliness and social dissatisfaction in middle childhood is a surprisingly stable phenomenon. Consistent with previous research (Hymel & Franke, 1985; Hymel et al., 1983), initial loneliness scores predicted loneliness ten weeks (r=.66) and one year later (r=.56). The loneliness measure was as stable as peer acceptance, and more stable than the friendship nomination measure. These findings suggest that loneliness in mid-

dle childhood is not a readily changeable mood state. For this sample of children, self-reported loneliness remained relatively consistent across the one-year interval even though it included a change in grade, a new teacher, and some reorganization of classmates.

The concurrent regression analyses indicated that loneliness is predicted by a cumulative set of measures of social functioning. Children most likely to be lonely are the withdrawn and low-accepted children who have few if any friends and who attribute perceived social rebuke to internal-stable factors rather than to external-stable factors. The regression analyses showed that each aspect of social functioning added significantly to the prediction, which supports the exacerbatory model proposed by Asher et al. (1990).

The prospective regression analyses indicated the importance of considering differential time-lags. After controlling for children's initial loneliness (Time 1) none of the other Time 1 measures predicted loneliness across the ten-week interval (Time 2). However, across the forty-week interval after controlling for prior loneliness, the sociometric and attribution measures predicted loneliness (Time 3). These results indicate that the children likely to experience greater loneliness over time are those who currently have few friends, are poorly accepted by classmates, and tend not to attribute social rebuke to external-stable factors.

In considering the relation between friendship and loneliness, our findings showed that remaining without friends over time was associated with increasing levels of loneliness, while maintaining a number of friends (two or more) was associated with decreasing levels of loneliness. One explanation for this finding is that by providing children with access to important social and emotional provisions (Berndt, 1989; Cauce, 1986; Parker & Gottman, 1989), friendships function to reduce feelings of loneliness and social dissatisfaction. For example, Cohn, Lohrmann, and Patterson (1985) found that loneliness, as determined by the Asher and Wheeler (1985) measure, was moderately and negatively related to the number of friends with whom children could talk intimately in their friendship networks. Interestingly, this relationship was considerably larger than that found between loneliness and the actual number of friends, suggesting that it may not be number of friends per se which leads to lower loneliness but rather the qualities associated with these friendships (Parker & Asher, 1989). A second explanation as to why two or more friendships result in reduced feelings of loneliness is that multiple friendships provide diverse sources of support in times of social hardship and stress (Berndt, 1989; Ladd, 1990).

It appears that both peer acceptance and friendship serve distinct functions in the experience of loneliness in middle childhood (Asher et al., 1990). In support of this view, we found that each sociometric measure accounted for significant and additional variance in loneliness, even after the effect of the other measure had been statistically controlled (see Note 2). As Asher et al. (1990) have speculated, low peer acceptance may lead to feelings of social isolation and few or no friendships may lead to feelings of emotional isolation (Weiss, 1973). This is consistent with Sullivan's (1953) view that a close friendship provides children with a sense of self worth and security which in turn functions to reduce anxiety about not belonging to the peer group. It is consistent also with Fine's (1981) qualitative research which suggests that friendships provide children with a solid base from which to develop interpersonal confidence in the wider group. In addition, acceptance by the peer group may be important if children are to develop a healthy and stable self-concept and avoid developing feelings of inferiority and worthlessness (Sullivan, 1953).

With regard social behavior, the present study assessed a narrow range of social behaviors. While the results of the study provided evidence to suggest (i) that withdrawn behavior is predictive of concurrent loneliness, and (ii) over time lonely children become more withdrawn, it should be stressed that other social behaviors not assessed in this study may also be associated with loneliness. For example, the second of two developmental pathways leading to peer rejection outlined by Rubin et al. (1990), proposed that social anxiety, negative self-regard, insecurity, and immaturity may also result in children experiencing heightened feelings of loneliness. Future research needs to employ a wider set of behaviors (for example, items assessing social immaturity) to determine whether there is support for this view. In addition, although teacher ratings of social behavior are known to be valid and reliable they may not be the best method for detecting isolate behavior in children. Research by Coie and Dodge (1988) suggests that observational data may be of most use in assessing isolate behavior, whereas teacher ratings of withdrawn behavior may be

more useful in assessing the degree to which children are socially acceptable to, and socially interact with their peers. The method future investigators choose to employ will depend on the particular facet of withdrawn behavior that is of prime consideration.

Self-reported loneliness reflects current difficulties in a child's social functioning, but it also seems to be sensitive to emerging difficulties. Support for this suggestion comes from results of the regression analyses which indicated that prior loneliness was predictive of more withdrawn behavior, a more internal-stable attributional style, fewer friendships, and lowered peer acceptance. One explanation for these findings is that the loneliness measure is picking-up feelings of dissatisfaction with existing peer relationships that have yet to be fully resolved. Over time, the strains in the peer relationships (indicated by the initial loneliness scores) lead to fewer friends, more withdrawn behavior, loss of peer acceptance, which in turn is likely to further exacerbate feelings of loneliness and a self-blaming attributional style.

Reflecting the importance of accounting for differential time-lags in longitudinal research, regression analyses indicated that sociometric and attributional indices of social functioning were predictive of changes in loneliness and social dissatisfaction over the forty-week interval but not over the ten-week interval. These findings indicate that a longer time-lag than ten weeks may be required if the effects of measures of social functioning on later loneliness are to be detected. In support of this explanation, subgroup analyses indicated that children who maintained their number of friends over the ten-week interval also maintained their level of loneliness. In contrast, over the forty-week interval children who maintained their friendless status developed more extreme feelings of loneliness and social dissatisfaction, whereas children who maintained two or more friends across this interval expressed less loneliness and social dissatisfaction. Taken together, these findings suggest that children who are without friends for an extended time may be locked within a particularly debilitating social milieu of emotional distress and exclusion from social resources.

In conclusion, the findings from the present study confirm the view that childhood loneliness occurs within, and is sustained over time by a web of interrelated aspects of social functioning. Of particular interest to researchers trying to identify 'at risk' groups of children, is the finding that heightened loneliness at a particular time, foreshadowed disruption to multiple aspects of children's social functioning. The loneliness measure, therefore, may provide teachers, school counsellors, and parents with advanced warning of a deterioration in the child's social functioning. It suggests also that loneliness should be included as an outcome measure of intervention programs since it provides data on children's current social functioning, and may indicate the longer-term prospects.

Footnotes

1 Preliminary analyses were conducted to determine whether stability coefficients were consistent across sex and grade using Fischer's z transformation procedure. Of the 72 stability coefficients computed, three showed sex differences and two showed grade differences. As this number is no more frequent than one would expect by chance, it was concluded that stability coefficients were consistent across sex and grade.

2 For the sake of clarity, Table 2 does not present results of regressions in which peer acceptance was entered in the regression analysis after friendship nominations. These analyses indicated that after partialing out friendship nominations, peer acceptance accounted for significant and additional variance in all regressions for which friendship nominations were significant predictors of loneliness. Thus, our results suggest that friendship nominations and peer acceptance have independent effects on children's levels of loneliness. Futher information about these analyses are available from the authors.

3 To maintain parsimony with previous analyses, we present but do not interpret results of t-tests for the one-year interval (see Table 5).

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Table 1

Correlations Between Loneliness and Measures of Social Functioning

	lone1	with1	agg1	pacc1	frnd1	isat1	esat1	lone2	with2	agg2	pacc2	frnd2	isat2	esat2	lone3	pacc3	frnd3	isat3
with1	.23																	
agg1	.04	-.21																
pacc1	-.35	-.34	.25															
frnd1	-.23	-.13	.00	.33														
isat1	.33	.05	.01	-.10	-.04													
esat1	-.16	-.24	.10	.01	.09	-.44												
lone2	.66	.27	-.10	-.24	-.18	.28	-.03											
with2	.38	.71	-.23	-.40	-.22	.09	-.05	.40										
agg2	.06	-.22	.70	.17	.00	-.01	.00	-.03	-.27									
pacc2	-.34	-.32	.34	.71	.19	-.09	.08	-.35	-.35	.27								
frnd2	-.33	-.23	.22	.32	.57	-.17	.02	-.46	-.22	.12	.53							
isat2	.15	.01	-.06	-.03	-.07	.37	-.25	.31	.13	-.02	.01	-.17						
esat2	-.07	-.11	-.03	.13	.06	-.02	.25	-.06	-.02	.00	07	.07	-.30					
lone3	.56	.12	-.12	-.28	-.25	.22	.01	.66	.33	-.10	-.44	-.34	.24	-.06				
pacc3	-.33	-.12	.07	.39	.10	-.11	.09	-.33	-.26	.09	.36	.40	-.17	03	-.58			
frnd3	-.27	-.30	.19	.39	.13	-.09	.04	-.34	-.27	.19	.42	.39	-.11	.16	-.56	.39		
isat3	.52	.14	.03	-.29	-.19	.41	-.16	.46	.21	-.04	-.35	-.25	.25	-.06	56	-.29	-.31	
esat3	-.32	-.02	.14	.10	.04	-.11	.34	-.18	-.06	07	.09	.06	00	04	-.23	20	03	-.56

NOTE. -- lone = loneliness; with = withdrawn social behavior; agg = aggressive social behavior; pacc = peer acceptance; frnd = same-sex friendship nominations; isat = internal-stable attributions; esat = external-stable attributions; 1 = Time 1; 2 = Time 2; 3 = Time 3. rs ≥ ±.18 are significant, p<.05, rs ± .23 are significant, p<.01 based on two-tailed tests.

Table 2

Regression Analyses: Predicting Loneliness From Concurrent and Prior Measures of Social Functioning

Predictors	Loneliness Time 2					Loneliness Time 3				
	Rsq	Rinc	F	Beta	B	Rsq	Rinc	F	Beta	B
Concurrent Analyses:										
lone	.44	.44	77.13[c]	.66	.76	.44	.44	68.62[c]	.66	.70
sex	.44	.00	.05	-.02	-.39	.44	.00	.43	-.05	-1.32
grade	.45	.01	1.71	-.13	-.41	.44	.00	.70	.07	.76
agg	.46	.01	2.03	-.12	-.34	----	----	----	----	----
with	.49	.03	4.53[a]	.17	1.20	----	----	----	----	----
pacc	.52	.03	5.18[a]	-.21	-2.20	.51	.07	12.22[c]	-.28	-2.92
frnd	.55	.03	4.97[a]	-.19	-2.88	.64	.13	29.87[c]	-.39	-5.83
isat	.57	.02	4.81[a]	.16	1.57	.66	.02	3.87[a]	.16	1.27
esat	.58[c]	.01	.47	-.07	-.36	.66[c]	.00	.14	-.03	-.25
Prospective Analyses:										
lone	.44	.44	81.80[c]	.66	.76	.44	.44	71.74[c]	.66	.70
sex	.44	.00	.05	-.02	-.39	.44	.00	.45	-.05	-1.32
grade	.45	.01	1.62	-.13	-.41	.44	.00	.73	.07	.76
agg	.46	.01	1.77	-.12	-.34	.45	.01	.86	-.07	-.56
with	.46	.00	1.71	.10	.66	.45	.00	.30	.05	.30
pacc	.46	.00	.41	-.06	-.67	.49	.04	6.12[b]	-.23	-2.89
frnd	.47	.01	.58	-.06	-.92	.53	.04	6.78[b]	-.25	-4.59
isat	.47	.00	.14	-.03	-.26	.53	.00	.86	.07	.79
esat	.48[c]	.01	.95	-.08	-.59	.56[c]	.02	4.96[a]	-.17	-1.47

NOTE. -- Rsq = squared multiple correlation; Rinc = increment to the squared multiple correlation; F = F value for the change in R^2; Beta = standardized regression coefficient; B = unstandardized regression coefficient; lone = loneliness; agg = aggressive social behavior; with = withdrawn social behavior; pacc = peer acceptance; frnd = same-sex friendship nominations; isat = internal-stable attributions; esat = external-stable attributions.

a $p < .05$
b $p < .01$
c $p < .001$

Table 3

Prospective Analyses: Predicting Changes in Measures of Social Functioning From Antecedent Loneliness

	with2			agg2			pacc2			frnd2		
PREDICTORS	Rsq	Rinc	Beta	Rsq	Rinc	Beta	Rsq	Rinc	Beta	Rsq	Rinc	Beta
with1	.50	.50[c]	.70	----	----	----	----	----	----	----	----	----
agg1	----	----	----	.49	.49[c]	.70	----	----	----	----	----	----
pacc1	----	----	----	----	----	----	.51	.51[c]	.71	----	----	----
frnd1	----	----	----	----	----	----	----	----	----	.32	.32[c]	.57
sex	.55	.05[b]	-.23	.49	.00	.07	.51	.00	-.02	.33	.01	.06
grade	.55	.00	- 03	.49	.00	-.01	.51	.00	-.03	.33	.00	.04
lone1	.59[c]	.04[c]	.19	.50[c]	.01	-.05	.52[c]	.01	-.10	.38[c]	.05[c]	-.24

	esat2			isat2		
esat1	.06	.06[a]	.25	----	----	----
isat1	----	----	----	.13	.13[c]	.36
sex	.06	.00	.03	.14	.01	-.10
grade	.07	.01	.11	.16	.02	.17
lone1	.07	.00	-.02	.17	.01	.08

	pacc3			frnd3			esat3			isat3		
pacc2	.13	.13[c]	.36	----	----	----	----	----	----	----	----	----
frnd2	----	----	----	.10	.10[c]	.32	----	----	----	----	----	----
esat2	----	----	----	----	----	----	.00	.00[c]	.04	----	----	----
isat2	----	----	----	----	----	----	----	----	----	.06	.06[c]	.25
sex	.13	.00	.05	.13	.03	.17	.02	.02	.13	07	.01	05
grade	.18	.05	.24	.14	.01	-.06	.04	.02	.16	07	.00	.04
lone2	.21[c]	.03[a]	-.18	.15[b]	.01	-.12	.10[a]	.06[b]	-.25	23[c]	.16[c]	.42

NOTE. -- Rsq = squared multiple correlation; Rinc = increment to the squared multiple correlation; Beta = standardized regression coefficient; lone = loneliness; with = withdrawn social behavior; agg = aggressive social behavior; pacc = peer acceptance; frnd = same-sex friendship nominations; isat = internal-stable attributions; esat = external-stable attributions; 1 = Time 1; 2 = Time 2; 3 = Time 3.

a $p < .05$
b $p < .01$
c $p < .001$

Table 4

Loneliness and Social Dissatisfaction as a Function of Friendship Nominations at Each Assessment Occasion

Assessment Occasion		Friendship Group			Sub-group, F
		0 friends	1 friend	≥ 2 friends	
Time 1	N	13	21	94	3.56*
	M	34.87[a]	34.50[b]	28.59[ab]	
	SD	13.22	15.56	8.51	
Time 2	N	10	25	84	15.84**
	M	47.00[a]	34.09[a]	27.84[a]	
	SD	15.83	10.54	9.90	
Time 3	N	11	20	80	23.32**
	M	47.40[a]	33.55[a]	24.72[a]	
	SD	17.90	14.30	7.73	

Note: Groups sharing horizontal superscript differ, p<.05 by Student-Newman-Keuls tests.

* p<.05
* * p<.001

Table 5

Loneliness and Social Dissatisfaction as a Function of Friendship Maintenance

Assessment Occasion		Friendship Maintenance Subgroup			Subgroup, F
		F-M	S-M	M-M	
	N	9	18	72	
Time 1	M	49.11[a]	35.11[a]	28.13[a]	18.01*
	SD	13.48	14.81	8.84	
Time 2	M	50.00[b]	34.22[b]	28.03[b]	22.65*
	SD	10.70	10.42	9.09	
Time 3	M	58.55[bc]	34.56[c]	25.91[abc]	53.18*
	SD	11.31	10.58	8.44	

Note: F-M = friendless-maintainers, S-M = single friend maintainers, M-M = multiple friend maintainers. Groups sharing horizontal or vertical superscripts differ, $p<.05$ by Newman-Keuls tests.

* $p<.001$