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ORIGINAL PAPER

Major Life Events as Predictors of Loneliness in Adolescence

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Abstract The present study investigates the validity of early major life events as predictors of loneliness among 978 high-school students. A cross-sectional research design was utilized to examine the relationship between latent classes of six major life events and feelings of family-related and peer-related loneliness. Latent class analysis revealed three distinct event typologies: a normative group, a mover and divorce group, and a loss and illness group. Subsequent logistic regression revealed that membership of the movers and divorce group was associated with family-related loneliness, but not with peer-related loneliness. Membership of the loss and illness group was not associated with family-related or peer-related loneliness. The study lends some support to theoretical approaches that associate loneliness with major life events. However, the mixed study results underscore the relevance of investigating a spectrum of life events and distinguishing between different sources of loneliness.

Keywords Loneliness · Life events · Adolescence · Latent class analysis · Family

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Introduction

Loneliness, a negative emotional response to a discrepancy between desired and achieved levels of social contact (Perlman and Peplau 1981), is a potent, but often neglected risk factor for psychopathology, morbidity, and mortality (Heinrich and Gullone 2006; Miller 2011). Hence, identifying possible sources or antecedents of loneliness is an important research target. However, to the best of our knowledge, no studies have investigated typologies of life events as predictors of loneliness in adolescence, a period of life where loneliness is particularly prevalent (Heinrich and Gullone 2006).

Theoretical approaches to loneliness (e.g., the cognitive processes approach, the social needs approach, and the interactionist approach; Peplau and Perlman 1979; Weiss 1973, 1982) have assigned importance to major life events that cause changes in a person's social relationships (e.g., the loss of a loved one, divorce, or the moving of residence). Indeed, such life events have been highlighted as both probable triggers and maintaining causes of feelings of loneliness (e.g., McInnis and White 2001; Shaver and Rubenstein 1980; Terrell-Deutsch 1999). Moreover, people often describe experiences of loneliness in terms of interpersonal situations or stressful life events (e.g., dislocation and loss; Hymel et al. 1999; McInnis and White 2001).

Several models have aimed to describe the relationship between life events and social maladjustment, including loneliness. The differential-exposure model rests on the theoretical notion that lonely individuals are exposed to stressful life events more frequently than non-lonely individuals (Cacioppo et al. 2003). More specifically, the life event model suggests that a single life event may provoke adjustment difficulties such as loneliness, whereas the chronic stress model suggests that maladjustment becomes

more pronounced as stressful life events continue (Ireland and Qualter 2008). Another approach is the added-stress model, advocated by Cacioppo and colleagues (Cacioppo et al. 2003; Cacioppo and Patrick 2008), which states that loneliness is associated with perceptions of social rejection and exclusion. According to this model, lonely individuals may report higher levels of perceived stress than non-lonely individuals, even when the frequency and intensity of the life events do not differ between the two groups.

Studies investigating the relationship between life events and loneliness in adolescence are scarce and yield mixed findings. Parental divorce, but not parental death (before the age of 18), has been associated with loneliness in adulthood (Rubenstein and Shaver 1982). However, family conflict rather than parental divorce status *per se* has been found to predict loneliness in college (Jones 1992). Furthermore, studies investigating the effect of geographic mobility rate on loneliness have yielded mixed results (Kelley et al. 2003; Rubenstein and Shaver 1982; Stephan et al. 1988). Similarly, the occurrence of serious illness in adolescence has been associated with increased loneliness (Curtin and Siegel 2003), whereas other studies have found no such association (e.g., Noll et al. 1996).

The studies referred to above all focused on the impact of single life events. Although these studies have contributed to the present knowledge base, they are limited given their failure to acknowledge that major life events often co-occur. For instance, parental divorce may be associated with the move of residence and a change of school. Moreover, experiencing co-occurring life events has been associated with a greater degree of maladjustment than experiencing a single major life event (e.g., Simmons et al. 1987). Indeed, cumulative family instability has been found to predict peer-related loneliness in fifth grade (Cavanagh and Huston 2008). Investigating a spectrum of life events in relation to loneliness is a relevant research avenue given that the events may interact in a manner that may be more detrimental to social and emotional development than the influence of one type of event alone.

Moreover, it is possible that the relationship between life events and loneliness is poorly described in linear studies. Evidently, self-reports of loneliness tend to be skewed (e.g., Lasgaard et al. 2007; Russell 1996) attributable to most people being non-lonely. As a consequence, there is a risk that the characteristics of people who are severely lonely (i.e., who report a high degree of loneliness) are masked in classic linear studies. Hence, studies that on the basis of deviations from the mean score on a standardized loneliness measure (e.g., the upper and the lower quartiles) compare equally sized groups of non-lonely and lonely may help identify sources or antecedents of loneliness (Lasgaard 2009).

In order to expand on the existing literature and remedy some of the shortcomings of earlier research, the present study aims to test whether underlying classes of major life events would predict feelings of loneliness in adolescence. Due to the scarcity and shortcomings of previous research, it was difficult to develop clear expectations regarding the results of the study. However, in accordance with the differential-exposure model, and more specifically the chronic stress model, we hypothesized that exposure to multiple major life events would be associated with feelings of loneliness in adolescence.

Method

Participants

Data from a national Danish high-school study were used (Lasgaard et al. 2011). A total of 46 schools participated in the study, which included 1009 high-school students ($M = 17.11$ years old; SD = 1.11) in the first-year group. Fifty-seven percent of the sample was female and most of the participants (i.e., 94 %) were born in Denmark. The demographic characteristics of the total sample were comparable to national figures of Danish high-school students (Lasgaard et al. 2011).

Procedure

The student sample was stratified using 10 different geographical areas (i.e., counties) with a roughly equal number of students in each area. From these areas, 68 randomly selected high schools were approached with the purpose of recruiting one randomly selected class from each school. The study was introduced to the principal of the selected schools, and the procedure used to secure a random selection of one high-school class in the first-year group was explained. The class teacher monitored the data collection according to standardized instructions. An accompanying letter informed the students about the procedures used to secure confidentiality and about the entirely voluntary nature of their participation.

Measures

Two subscales (five items each) from the Social and Emotional Loneliness Scale for Adults-Short Form (SELSA-S; DiTommaso et al. 2004) were used to capture family-related loneliness and peer-related loneliness (labeled 'social loneliness'). Items were rated on a 7-point Likert scale, and higher scores indicate higher levels of family-related loneliness and peer-related loneliness, respectively. Two sample items from the subscales are "I feel alone when I am with my family" and "I do not have any friends who understand me, but I wish I did". Prior to

data collection, the SELSA-S was translated into Danish using a translation-back-translation procedure and subsequently evaluated in a pilot study ($n = 62$) including students from three different high schools. The instrument has been shown to have high internal consistency and construct validity (DiTommaso et al. 2004; Goossens et al. 2009). In the present study, Cronbach's alphas were satisfactory (family-related loneliness = .87; peer-related loneliness = .81). However, scores were positively skewed (family-related loneliness = 1.59; peer-related loneliness = 1.67), indicating that relatively few students scored highly on the subscales. Moreover, scores on both subscales demonstrated positive kurtosis (family-related loneliness = 2.44; peer-related loneliness = 3.44). On the basis of the SELSA-S score, categories of students were defined, that is, students reporting family-related loneliness and peer-related loneliness (upper quintile), respectively, and students reporting no family-related loneliness and peer-related loneliness (lower quintile), respectively.

Six major life events were assessed using items from the Junior High Life Experiences Survey (Swearingen and Cohen 1985), a validated life event measure. The six events investigated were (1) parental divorce (or separation), (2) death of parent or sibling, (3) serious illness (child), (4) serious illness (parent), (5) moving of residence, and (6) change of school. Reports on the life events were obtained by inquiring whether at the age of 6–15 years old the respondents had ever experienced the specific events ('yes' or 'no') and the total number of moving of residence and changes of school. Given that a single move of residence or change of school during childhood and early adolescence is quite common in Denmark, only multiple moves of residence or changes of schools (i.e., two or more) were coded as major life events.

Data Analysis

Prior to data analysis, 31 students (aged 20–26 years) were dropped from the sample because they had a non-traditional high-school-age and, hence, did not represent the developmental period investigated in the present study (i.e., adolescence).

Latent class analysis (LCA; Hagenaars and McCutcheon 2002; McCutcheon 1987) was implemented using Mplus 6 statistical software (Muthén and Muthén 1998–2010). LCA was employed with the aim of empirically uncovering meaningful classes of major life events. In the present study, six major life events (as described above) were used as indicators for the latent class models. All indicators were declared categorical, and all parameters were estimated using the default robust maximum likelihood (MLR) estimator. LCA is based on the statistical concept of likelihood; thus, it is a probabilistic rather than deterministic technique. LCA therefore estimates two parameters (i.e., conditional item probabilities and class membership probabilities). The former reflects the probability of endorsement of indicators for each case within each class. Thus, individuals are assigned probability values for membership of all classes. They are categorized into the class for which they received the highest probability value. The latter reflects the prevalence of each of the individual classes within a particular class model (Nylund et al. 2007a, b). The number of classes is not known a priori. Therefore, latent class models of varying class numbers are estimated and then compared based on a number of fit indices.

Given that there is no single indicator reflecting an optimal model fit, model selection was based on a balance of parsimony, substantive consideration, and several fit indices. Fit indices assessed were the Akaike Information Criterion (AIC; Akaike 1987), the Bayesian Information Criterion (BIC; Schwartz 1978), the sample size adjusted BIC (SSABIC; Sclove 1987), the Lo-Mendell–Rubin-adjusted likelihood ratio test (LRT; Lo et al. 2001), and the Entropy statistic (Ramaswamy et al. 1993).

Lower values of the AIC, BIC, and SSABIC indicate better fitting models. Yang (2006) reported that the SSABIC was the most accurate information criterion. In addition, simulation studies conducted by Nylund et al. (2007a, b) concluded that the BIC was the most reliable indicator when deciding on the number of latent classes in a study population.

The LRT value was used to compare class models with varying numbers of classes. A non-significant LRT value indicates that the latent class model with one less class is the most parsimonious option. The Entropy statistic is used to determine the accuracy with which cases are assigned to classes. Entropy values range from 0 to 1 with values approaching 1 indicating clearer classification of cases. After consulting the fit indices and prior to selecting the optimal class model, we considered whether the classes were distinct and conceptually meaningful.

Following identification of the optimal class solution, logistic regression (LR) analysis was employed to determine if classes could be differentiated from each other based on family-related and peer-related loneliness as compared with non-loneliness. The associations were evaluated using odds ratios (ORs) and 95 % confidence intervals (CIs). A 'normative' class (i.e., Class 1) was used as the reference category and so all ORs for classes (i.e., Class 2 and Class 3) are as compared with this class.

Results

The average number of reported life events per adolescent was 0.66 (SD = .90; percentages who experienced zero events = 57 %, one event = 25 %, two events = 14 %, three or more events = 4 %). Table 1 presents the prevalence of the six separate life events for all students and students reporting family-related and peer-related loneliness.

Latent class models of two to six classes, employing the six indicators of major life events, were specified and estimated. The resultant fit indices are presented in Table 2. The three-class solution was deemed optimal. More specifically, the SSABIC was lowest for the three-class solution compared to all alternatives. Yang (2006) has previously suggested that the SSABIC is the best indicator of model fit. Moreover, the LRT became non-significant for the four-class solution, which indicates that the three-class solution was a more parsimonious model. The AIC was lowest for the four-class solution, but the difference in values between the three and the four-class solution was negligible (0.129). The BIC was lowest for the two-class solution; however, once again, it was only marginally lower than the value of the BIC in the three-class solution (3.049). All other BIC values were markedly higher. This suggests that the AIC had difficulty differentiating between the three- and the four-class solution, whereas the BIC had difficulty differentiating between the two- and the three-class solution. On balance with alternative fit indices and substantive meaning of classes, this suggests that the three-class solution was the optimal choice.

Table 3 presents the average latent class probabilities for the most likely latent class membership. Given that the values on the diagonal are high and the values off the diagonal are low, the classification of cases into classes was regarded as clear. The Entropy value of .995 indicated clear classification of cases in the three-class solution. Indeed, cases were more clearly classified in the three-class solution compared with the four, five, and six class solutions.

The latent class profile plot indicating the probability of endorsement, across each of the three classes and for each life event, is presented in Fig. 1. The normative or baseline class was Class 1 which comprised 78.7 % of the sample. Class 2 comprised 19.6 % of the sample. Comprising 1.7 % of the sample, Class 3 was the smallest of all classes. Class 1 was characterized by individuals who had low endorsement probabilities for all major life experiences. Notably, the probability of endorsement of multiple school moves and parental divorce was higher for individuals in Class 3 than for individuals in Class 1, but only marginally so. Class 1 may accordingly be termed the 'normative' class. Class 2 was characterized by individuals who had extremely high endorsement probabilities for the experiences of multiple residence moves, multiple school moves,

Table 2 Fit indices for latent class models two to six

Model	AIC	BIC	SSABIC	Entropy	LRT (*p*)
2C	3670.204	3733.716	3692.428	0.999	149.388
					<.001
3C	3639.055	3736.765	3673.245	0.995	44.231
					<.001
4C	3638.926	3770.835	3685.083	0.957	13.842
					.1684
5C	3642.994	3809.101	3701.117	0.930	9.731
					.2588
6C	3649.298	3849.604	3719.388	0.932	7.539
					.0664

C Class, *AIC* Akaike Information Criterion, *BIC* Bayesian Information Criterion, *SSABIC* sample size adjusted Bayesian Information Criterion, *LRT* (*p*) Lo–Mendell–Rubin adjusted likelihood ratio test value and associated significance level

Table 3 The average latent class probabilities for most likely latent class membership

Entrophy = .995	Class 1	Class 2	Class 3
Class 1	.926	.017	.057
Class 2	.000	1.000	.000
Class 3	.000	.001	.999

Table 1 The prevalence of the six life events

	Parental divorce (%)	Death of parent or sibling (%)	Serious illness (%)	Parental illness (%)	Multiple moves of residence (%)	Multiples changes of school (%)
High-school students (all)	13	4	2	12	20	16
Family-related loneliness (upper quintile)	21	7	2	16	25	21
Peer-related loneliness (upper quintile)	13	4	<1	14	23	22

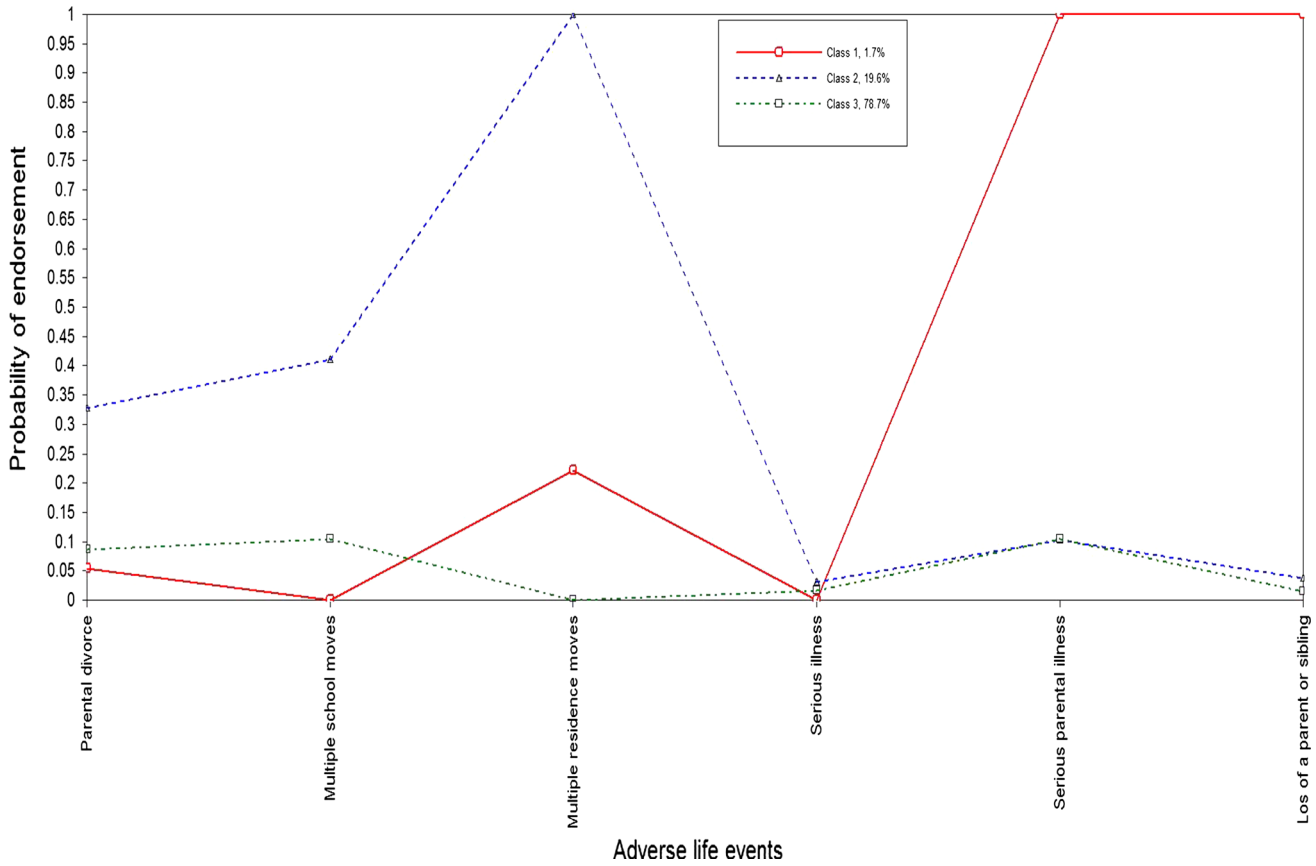

Fig. 1 Three class latent profile plot displaying response probabilities across major life events

and parental divorce. Individuals in Class 2 were more likely to endorse these experiences than individuals in any of the other classes. The probabilities of endorsement were comparatively similar to those of individuals in Class 1 for all other major life events, but were markedly lower than those of individuals in Class 3. This class may be termed the 'movers and divorce' class. Class 3 was characterized by individuals who had extremely high endorsement probabilities for the experiences of parental illness and the loss of a parent or sibling. Individuals in Class 3 were more likely to endorse these experiences than individuals in any of the other classes. Individuals in Class 3 also had higher endorsement probabilities for the experience of multiple residence moves than individuals in Class 1 but not compared with Class 2. The probabilities of endorsement were lowest for all other major life events for individuals in this class compared with Classes 2 and 3. Class 1 may therefore be termed the 'illness and loss' class.

Compared with the normative class, membership of the movers and divorce class was associated with family-related loneliness (OR 1.59; CI 1.02–2.48, $p < .05$), but not with peer-related loneliness (OR 1.25; CI 0.80–1.94, *ns*). Membership of the illness and loss class was not significantly associated with either family-related loneliness (OR 2.01; CI 0.58–6.99, *ns*) or peer-related loneliness (OR 1.85; CI 0.45–7.5, *ns*). Re-running the analysis with family-related loneliness and peer-related loneliness as continuous variables (ANOVA) did not change these results.

Discussion

In order to enhance our knowledge on precursors of adolescent loneliness, the present study was designed with the dual purpose of determining, first, if there were underlying typologies of life events in a population of high-school students; and, second, if the resultant event typology could predict loneliness. LCA identified three event types. As would be expected within the general population, the majority of the participants (nearly 80 %) were unlikely to report any major life events. The second largest group (nearly 20 %) reported experiencing multiple moves of school and residence as well as parental divorce. A final group that comprised less than 2 % of the sample reported experiences of parental illness and the loss of a parent or sibling.

The results of the present study partly confirmed our hypothesis that the experience of multiple life events is

associated with feelings of loneliness in adolescence. LR indicated that membership of the movers and divorce group was associated with family-related loneliness. This result suggests that the co-occurrence of family-related events that disrupts existing social relations could be associated with family-related loneliness years after the events. Indeed, parental divorce, family conflict, and associated stressors have an impact on all members of the family and research suggests that parental divorce may affect relationships during adolescence (e.g., Wallerstein and Blakeslee 1989). The present study supports these findings. Moreover, the relationship between the movers and divorce group and family-related loneliness lends some support to the notion that lonely individuals are exposed to stressful life events more frequently than non-lonely individuals (i.e., the differential-exposure hypothesis). Given the objective character of the investigated life events, it seems unlikely that the self-reporting of events is a result of perceptions of social rejection and exclusion (i.e., the added-stress hypothesis).

Interestingly, the movers and divorce group was not associated with peer-related loneliness. One could expect that multiple residence moves, multiple school moves, and parental divorce could affect peer relations in a negative manner as the child is called upon to create new relationships, decide whether and how to maintain contact with old network members, and cope with family conflict and potential feelings of loneliness. However, the results of the present study indicate that if peer-related loneliness increases as a result of such life events, then the experienced discrepancy between desired and achieved levels of social contact tends to be transitory. However, we are aware of no prior studies that have examined the relationship between classes of life events and different sources of loneliness. Hence, there is a need for further theorizing and additional research.

Furthermore, membership of the illness and loss group predicted neither family-related nor peer-related loneliness. This result is in accordance with a previously mentioned study that found no association between parental death and loneliness in adulthood (Rubenstein and Shaver 1982). However, given the low prevalence of the relative illness and loss class, the results of the present study may be compromised due to lack of statistical power. Future studies need to replicate or elaborate on this result.

The present study has a number of limitations. First, life events were assessed retrospectively. Although this is common practice, prospective data may lead to more accurate results. Second, the format of the life event measure is simple and does not capture the timing of the events. Moreover, only 6 major life events were assessed, whereas many other events could affect adolescents' loneliness, such as victimization, death of a friend, and abuse. Third, the prevalence of the relative illness and loss group was low, and this may have caused Type 2 errors. Fourth, the lack of information about the socioeconomic status of the participants is a limitation of the study. Despite the abovementioned limitations, the present study contributes to the body of literature on adolescent loneliness. The results of the LCA testify to the relevance of investigating typologies of life events in relation to loneliness. Indeed, major life events often co-occur. Moreover, the study lends some support to theoretical approaches and models that associate loneliness with major life events. Having said this, the mixed nature of the findings of the LR analysis underscores the relevance of investigating different types of life events as well as distinguishing between different sources of loneliness.

References

Akaike, H. (1987). Factor analysis and the AIC. *Psychometrika, 52*, 317–332. doi:10.1007/BF02294359.

Cacioppo, J. T., Hawkley, L. C., & Berntson, G. G. (2003). The anatomy of loneliness. *Current Directions in Psychological Science, 12*, 71–74. doi:10.1111/1467-8721.01232.

Cacioppo, J. T., & Patrick, W. (2008). *Loneliness*. New York: Norton.

Cavanagh, S. E., & Huston, A. C. (2008). The timing of family instability and children's social development. *Journal of Marriage and Family, 70*, 1258–1270.

Curtin, L. S., & Siegel, A. W. (2003). Social functioning in adolescents with epilepsy. *Children's Health Care, 32*, 103–114. doi:10.1207/S15326888CHC3202_2.

DiTommaso, E., Brannen, C., & Best, L. (2004). Measurement and validity characteristics of the short version of the Social and Emotional Loneliness Scale for Adults. *Educational and Psychological Measurement, 64*, 99–119. doi:10.1177/0013164403258450.

Goossens, L., Lasgaard, M., Luyckx, K., Vanhalst, J., Mathias, S., & Masy, E. (2009). Loneliness and solitude in adolescence: A confirmatory factor analysis of alternative models. *Personality and Individual Differences, 47*, 890–894. doi:10.1016/j.paid.2009.07.011.

Hagenaars, J. A., & McCutcheon, A. L. (2002). *Applied latent class analysis*. New York: Cambridge University Press.

Heinrich, L., & Gullone, E. (2006). The clinical significance of loneliness. *Clinical Psychology Review, 26*, 695–718. doi:10.1016/j.cpr.2006.04.002.

Hymel, S., Tarulli, D., Thomson, L. H., & Terrell-Deutsch, B. (1999). Loneliness through the eyes of children. In K. Rotenberg & S. Hymel (Eds.), *Loneliness in childhood and adolescence* (pp. 296–322). New York: Cambridge University Press.

Ireland, J. L., & Qualter, P. (2008). Bullying and social and emotional loneliness in a sample of adult male prisoners. *International Journal of Law and Psychiatry, 31*, 19–29. doi:10.1016/j.ijlp.2007.11.005.

Jones, D. C. (1992). Parental divorce, family conflict and friendship networks. *Journal of Social and Personal Relationships, 9*, 219–235. doi:10.1177/0265407592092004.

Kelley, M. L., Finkel, L. B., & Ashby, J. (2003). Geographic mobility, family, and maternal variables as related to the psychosocial adjustment of military children. *Military Medicine, 168*, 1019–1024.

Lasgaard, M. (2007). Reliability and validity of the Danish version of the UCLA Loneliness Scale. *Personality and Individual Differences, 42*, 1359–1366. doi:10.1016/j.paid.2006.10.013.

Lasgaard, M. (2009). *Loneliness in adolescence: Conceptualization, methodology, and empirical evidence*. Aarhus: Department of Psychology, Aarhus University.

Lasgaard, M., Goossens, L., & Elklit, A. (2011). Loneliness, depressive symptomatology, and suicide ideation in adolescence. *Journal of Abnormal Child Psychology, 39*, 137–150. doi:10.1007/s10802-010-9442-x.

Lo, Y., Mendell, N., & Rubin, D. (2001). Testing the number of components in a normal mixture. *Biometrika, 88*, 767–778. doi:10.1093/biomet/88.3.767.

McCutcheon, A. L. (1987). *Latent class analysis*. Thousand Oaks, CA: Sage.

McInnis, G. J., & White, J. H. (2001). A phenomenological exploration of loneliness in the older adult. *Archives of Psychiatric Nursing, 15*, 128–139. doi:10.1053/apnu.2001.23751.

Miller, G. (2011). Why loneliness is hazardous to your health. *Science, 331*, 138–140. doi:10.1126/science.331.6014.138.

Muthén, L. K., & Muthén, B. O. (1998). *Mplus user's guide* (6th ed.). Los Angeles: CA: Muthén & Muthén.

Noll, R. B., Vannatta, K., Koontz, K., Kalinyak, K., Bukowski, W. M., & Davies, W. H. (1996). Peer relationships and emotional well-being of youngsters with sickle-cell disease. *Child Development, 67*, 423–436. doi:10.1111/j.1467-8624.1996.tb01743.x.

Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007a). Deciding on the number of classes in latent class analysis and growth mixture modeling. *Structural Equation Modeling, 14*, 535–569. doi:10.1080/10705510701575396.

Nylund, K., Bellmore, A., Nishina, A., & Graham, S. (2007b). Subtypes, severity, and structural stability of peer victimization. *Child Development, 78*, 1706–1722. doi:10.1111/j.1467-8624.2007.01097.x.

Peplau, L. A., & Perlman, D. (1979). Blueprint for a social psychological theory of loneliness. In M. Cook & G. Wilson (Eds.), *Love and attraction* (pp. 99–108). Oxford, England: Pergamon.

Perlman, D., & Peplau, L. A. (1981). Toward a social psychology of loneliness. In S. Duck & R. Gilmour (Eds.), *Personal relationships 3* (pp. 31–56). New York: Academic Press.

Ramaswamy, V., Desarbo, W. S., Reibstein, D. J., & Robinson, W. T. (1993). An empirical pooling approach for estimating marketing mix elasticities with PIMS data. *Marketing Science, 12*, 103–124. doi:10.1287/mksc.12.1.103.

Rubenstein, C., & Shaver, P. (1982). The experience of loneliness. In L. Peplau & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research and therapy* (pp. 206–223). New York: Wiley.

Russell, D. (1996). UCLA Loneliness Scale (Version 3). *Journal of Personality Assessment, 66*, 20–40. doi:10.1207/s15327752jpa6601_2.

Schwartz, G. (1978). Estimating the dimensions of a model. *Annuals of Statistics, 6*, 461–464. doi:10.1214/aos/1176344136.

Sclove, S. L. (1987). Application of model-selection criteria to some problems in multivariate analysis. *Psychometrika, 52*, 333–334. doi:10.1007/BF02294360.

Shaver, P., & Rubenstein, C. (1980). Childhood attachment experience and adult loneliness. In L. Wheeler (Ed.), *Review of personality and social psychology* (pp. 42–73). Beverly Hills: Sage.

Simmons, R. G., Burgeson, R., Carlton-Ford, S., & Blyth, D. A. (1987). The impact of cumulative change in early adolescence. *Child Development, 58*, 1220–1234.

Stephan, E., Fäth, M., & Lamm, H. (1988). Loneliness as related to various personality and environmental measures. *Social Behaviour and Personality, 16*, 169–174. doi:10.2224/sbp.1988.16.2.169.

Swearingen, E. M., & Cohen, L. H. (1985). Life events and psychological distress. *Developmental Psychology, 21*, 1045–1054. doi:10.1037/0012-1649.21.6.1045.

Terrell-Deutsch, B. (1999). The conceptualization and measurement of childhood loneliness. In K. Rotenberg & S. Hymel (Eds.), *Loneliness in childhood and adolescence* (pp. 11–33). New York: Cambridge University Press.

Wallerstein, J. S., & Blakeslee, S. (1989). *Second chances*. New York: Tichnor & Fields.

Weiss, R. (1973). *Loneliness*. Cambridge: MIT Press.

Weiss, R. (1982). Issues in the study of loneliness. In L. A. Peplau & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research and therapy* (pp. 351–378). New York: Wiley.

Yang, C. (2006). Evaluating latent class analysis models in qualitative phenotype identification. *Computer and Statistical Data Analysis, 50*, 1090–1104. doi:10.1016/j.csda.2004.11.004.