

A Longitudinal Person-Centered Examination of Affinity for Aloneness Among
Children and Adolescents

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In loving memory of Alan Christopher Daly

1964/06/19 – 2018/01/13

“Miigwech”

Abstract

Affinity for aloneness (AFA; a tendency to enjoy time spent alone) among children and adolescents often has been viewed as negative, even though research on AFA among these age groups is scarce. Moreover, researchers have not accounted for the role that social anxiety (SA) might play in enjoying solitude. The purpose of this two-wave longitudinal study of children ($N = 605$, 47.76% female, $M_{age} = 9.29$ years) and early adolescents ($N = 596$, 51.51% female, $M_{age} = 12.20$ years) was to identify distinct groups based on responses to AFA and SA survey measures, to examine transitions between these groups over time, and to assess group differences in psychosocial adjustment (e.g., peer victimization, depressive symptoms) over time. Latent class analyses revealed four groups at T1 and T2 for both the children and early adolescents. Among these were normative (i.e., LowAFA/LowSA) and AFA (i.e., High AFA/LowModSA) groups. Transition analyses indicated that moving from the normative group at T1 to the AFA group at T2 was common among the early adolescents. In both the child and early adolescent samples, the AFA group did not differ from the normative group on any of the adjustment indicators at T2, controlling for scores at T1. These findings highlight the potentially benign nature of AFA among youth without high SA. Furthermore, they stress the importance of accounting for SA in studies of AFA in order to avoid the risk of pathologizing normal, potentially harmless behaviour.

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A longitudinal person-centered examination of affinity for aloneness among children and adolescents

Parents, educators, and researchers often are concerned when they observe a child or adolescent spending significant amounts of time on their own (Coplan & Armer, 2007). However, it is apparent that some youth enjoy spending time alone. Moreover, this tendency to enjoy being alone is not always a result of fearing social interactions or experiencing anxiety in the presence of peers. Indeed, some individuals may enjoy time alone for non-fearful or anxiety-related reasons (e.g., because they see value in it; Asendorpf 1990; Coplan et al. 2015; Goossens, 2013). This knowledge has led to the emergence of research examining both the prevalence and the well-being of youth who have an appreciation for solitude that is not driven by social fears or anxieties. This study aims to further build upon this existing research.

When it comes to research on youth who enjoy being alone, most authors have framed their work around the concept of *unsociability*. Unsociable individuals are typically described as those who have a non-fearful or non-anxious *preference* for solitude (rather than just an *enjoyment* of solitude). Researchers have found that these youth make up a small but noteworthy portion of the population (e.g., 15% of the sample in Coplan et al. 2013). Moreover, investigations into the psychosocial well-being of these individuals have produced somewhat mixed results, with some work suggesting that unsociability is relatively benign (e.g., Coplan et al., 2013, 2015; Ladd, Kochenderfer-Ladd, Eggum, Kochel, & McConnell, 2011), and other work suggesting that it may be associated with impairments to psychosocial functioning (Barstead et al., 2018; Liu et al., 2015).

Coplan, Ooi, and Baldwin (2018) speculate that there might be developmental timing effects in the link between unsociability and impairments to psychosocial functioning. They suggest that children who spend a lot of time alone might miss out on opportunities to learn social skills and develop a sense of belonging, which could have negative implications particularly in late childhood and early adolescence when social norms and expectations for peer interactions increase. The idea that early adolescence might be a particularly sensitive time for peer interaction also is supported by recent research on adolescent brain development. Casey (2015) argues that there is asynchrony in the maturation of neural circuits within and between different brain systems, with circuitry within the subcortical limbic-striatal brain system (associated with socioemotional processing) maturing early in adolescence but interconnections to the prefrontal executive system (associated with self-control and potential suppression of socioemotional impulses) maturing later in adolescence. This asynchrony is thought to lead to heightened activation of the limbic-striatal system in early adolescence, which is associated with increased social and emotional sensitivity to peers. Thus, any negative implications of unsociability might be highest in late childhood or early adolescence.

In a separate, but related line of work, researchers have studied individuals with what is known as an affinity for aloneness (AFA). Individuals with an AFA are said to *enjoy* solitude, without necessarily *preferring* it over being with others (Goossens, 2013). Studies of AFA are scarce, and the few studies that have been conducted have focused on adolescents, with the exception of some work examining the measurement of this construct in childhood (see Goossens & Beyers, 2002; Maes, Van Den Noortgate, & Goossens, 2015), and how this enjoyment of solitude is related to parenting behaviours

and attachment styles during this stage of life (see Richaud de Minzi, 2006). This lack of AFA research among children is due perhaps to the belief that compared to children, adolescents may be particularly likely to enjoy time spent alone. Indeed, time spent alone during adolescence may provide individuals with opportunities to pursue their own interests, engage in identity exploration or self-reflection, and develop independence from their parents. As such, it is believed that individuals with an AFA choose to spend time alone for positive reasons, rather than negative ones (e.g., because they're socially anxious; Goossens, 2013; Goossens & Marcoen, 1999; Larson, 1990).

AFA research generally has focused on how common this non-fearful tendency to enjoy solitude is across different periods of adolescence. Overall, having an AFA appears to be more common in the latter parts of adolescence. Indeed, two cross-sectional studies have indicated that adolescents aged seventeen and older score significantly higher on measures of AFA than individuals in early or mid-adolescence (note that AFA levels did not differ significantly between early and mid-adolescents; Corsano, Majorano, & Champretavy, 2006; Marcoen & Goossens, 1993). Similarly, a recent longitudinal study found that in two large samples of adolescents, AFA increased significantly from mid (i.e., ≈ 15 years old) to late-adolescence (i.e., ≈ 18 years old; Danneel, Maes, Vanhalst, Bijttebier, & Goossens, 2018). At first glance, these results may seem to contradict the previously noted idea that enjoyment of solitude should be more common in adolescence, and instead, suggest that this doesn't occur until late adolescence. However, these studies did not include assessments of AFA in children, therefore preventing the ability to examine whether the prevalence of this construct is greater in early adolescence relative to childhood. Thus, the first goal of the current study

was to address this limitation.

Research in this area also has assessed the well-being or psychosocial adjustment of adolescents with an AFA. Two cross-sectional studies found that AFA was positively associated with potentially valuable behaviours (e.g., self-reflection, exploration of political or religious beliefs; Goossens & Marcoen, 1999) or personality traits (e.g., conscientiousness, openness to experience; Teppers et al., 2013), while other cross-sectional studies found that AFA was negatively associated with psychosocial functioning. For instance, Corsano et al. (2006) and Marcoen, Goossens, and Caes (1987) found that AFA was linked to difficulties with peer relationships (e.g., lower friendship quality and quantity, more problems getting along with others), and impairments to psychological functioning (e.g., negative outlooks on the future, lower emotional stability; see also Teppers et al., 2013). Similar results have been found in two recent cross-sectional studies that used cluster analyses to identify a group of individuals who scored high on measures of AFA and low or moderate on measures of aversion to aloneness. In both studies, individuals in the AFA group reported significantly lower self-esteem than those who were characterized by low AFA and low aversion to aloneness (Maes, Vanhalst, Spithoven, Van den Noortgate, & Goossens, 2016; Teppers, Luyckx, Vanhalst, Klimstra, & Goossens, 2014). Additionally, Maes et al. (2016) found significant differences between these two groups such that compared to those with high AFA, those with low AFA and low aversion to aloneness scored higher on measures of friendship quality and quantity, social competence, and the extent to which they were liked by their peers.

While this previous research on AFA is informative, it is limited by the fact that

researchers did not control for social anxiety (SA). Individuals with an AFA are believed to enjoy time spent alone for positive, rather than negative (e.g., SA) reasons (Goossens, 2013). Without controlling for SA in these analyses, any AFA group could include individuals who spend time alone because they're socially anxious (perhaps because of peer victimization) *and* individuals who spend time alone for more positive reasons. As extensive research has demonstrated that SA is negatively associated with psychosocial functioning among youth (e.g., greater victimization by peers, greater depressive symptoms; Siegel, la Greca, & Harrison, 2009; van Zalk & van Zalk, 2019), associations found between AFA and negative adjustment in previous research could be because AFA groups included individuals with high social anxiety. Researchers who study the more restricted construct of *preference* for solitude have begun to control for social anxiety (e.g., Barstead et al., 2018; Coplan et al., 2013; Liu et al., 2015, 2017); however, this approach has not been used in studies of AFA.

Another limitation to previous research on AFA is the over-reliance on variable-centered, as opposed to person-centered analyses. Variable-centered analyses are not as effective as person-centered analyses when it comes to accounting for small subgroups within a sample (Howard & Hoffman, 2018). Given that individuals with an AFA may represent a small portion of the adolescent population, the use of variable-centered approaches could lead to these individuals being overshadowed by the rest of the population. This has implications for studies of both the prevalence and psychosocial functioning of individuals with an AFA as it may become difficult to obtain accurate assessments of these individuals if they are buried within the overall sample. Moreover, person-centered analyses may be particularly useful for studies of AFA as they allow

researchers to separate individuals into different groups based on AFA and SA scores (e.g., a high AFA with low SA group, or a high AFA with high SA group). As such, the present study used latent class analysis (LCA; i.e., a type of person-centered analysis) to identify distinct subgroups of children and early adolescents based on measures of AFA and SA. Doing so provided an opportunity to address two research questions: 1. Is there evidence of a group, in both late childhood and early adolescence, who enjoy solitude but are not socially anxious (i.e., high AFA with low SA scores)?, and 2. If there is evidence for an AFA group, how prevalent is AFA in early adolescence compared to late childhood?

We also addressed another limitation in research examining AFA; that is, the lack of longitudinal data. We used data collected at two time points (one year apart) for both a late childhood and an early adolescent sample. Doing so also allowed us to examine whether having high AFA with low SA becomes more common across time in both late childhood and early adolescence.

To further develop our knowledge of how this non-fearful enjoyment of solitude develops among youth, we used latent transition analyses (LTAs) to examine the stability of membership in this group across time (i.e., do youth who belong to the AFA group at Time 1 belong to the same group at Time 2?). Moreover, we examined patterns of movement into this group at Time 2 from other groups found at Time 1, in order to see whether certain individuals from Time 1 were more or less likely than others to become a member of this group by Time 2. Following this, we examined our final research question concerning the psychosocial adjustment of youth who enjoy time spent alone. Given that previous research has relied predominantly on concurrent and cross-

sectional designs, researchers have been unable to assess change over time among these individuals. Thus, we asked: How do the groups from our latent class analyses at Time 1 differ in psychosocial adjustment at Time 2 (one year later)? In this analysis, we controlled for Time 1 scores on these adjustment indicators, along with age, sex, and parental education (used as a proxy for socioeconomic status). As was the case for the LCAs, these LTAs and psychosocial adjustment analyses were carried out separately for the late childhood and early adolescent samples. We considered these age groups particularly important to study given Coplan et al.'s (2018) suggestion that the negative consequences of time spent alone might increase at these ages (see above).

We hypothesized that we would find groups with high levels of AFA but potentially varying degrees of SA (e.g., some with high SA, some with low SA). We also predicted that individuals with higher levels of SA would show signs of more negative adjustment relative to individuals with lower levels of SA. Due to the lack of research on AFA, alongside our use of a person-centred approach to studying it, further analyses were exploratory.

Method

Participants

The participants were 1201 students (49.62% female) from several elementary schools in Ontario, Canada, who were surveyed annually for two years, beginning in 2017. The late childhood sample was composed of participants in grades three to five at Time 1 ($N = 605$, 47.76% female, $M_{age} = 9.29$ years, $SD = 0.93$ years), while the early adolescent sample was composed of participants in grades six to eight at Time 1 ($N = 596$, 51.51% female, $M_{age} = 12.20$ years, $SD = 0.92$ years). The sample was composed

of primarily Canadian-born students (96.90%). Parent report indicated that 83.6% of the children and adolescents were White, 2.7% were Hispanic, 2.2% were Asian, 1.9% were Black, 1.8% were Indigenous, and 6.8% were Mixed (1% preferred not to answer). Mean levels of parental education (reported by parents and used as a proxy for socioeconomic status) fell between “some college or university (no degree/diploma)” and “completed an associate, college, or technical program/diploma.”

Procedure

Students were invited to participate in the study during visits to their schools. Each year, the survey was completed in two separate parts, both occurring within a four-month period (January-April). Trained researchers and volunteers administered the surveys to participants in their classrooms during regular school hours. Participants received gifts (e.g., backpacks, pencils) as compensation. All students who participated in the first year were invited to participate again in the second year. Participants provided informed assent while their parents provided informed consent. The study was approved by the university ethics board prior to survey administration at both assessments.

Missing Data Analysis

In total, 15.72% of all expected values across both waves were missing. Missing data occurred because some students did not complete all the questions in the surveys (average missing data was 1.91% at Year 1, and 1.56% at Year 2), and because some students did not complete each part of the survey in Year 1 and Year 2. (As mentioned in the procedure, each year the survey was split into two parts that were completed at different time periods; missing data was primarily due to absenteeism but also occasionally due to time conflicts, students declining to participate in one part of the

survey, and students moving from the school district.) For the first part of the survey (containing the age, grade, sex, SA, peer victimization, and friendship quality questions), 8.40% of students missed the survey in Year 1, and 18.23% missed the survey in Year 2. For the second part of the survey (containing the AFA, self-esteem, and depressive symptoms measures), 9.74% of students missed the survey in Year 1, and 19.48% missed the survey in Year 2. Participants who did not complete Part 1 of the survey in Year 2 reported significantly higher peer victimization in Year 1 than participants who completed the survey in both Year 1 and 2 ($p = .001$). Missingness was not associated with any of the other study variables. Missing data were estimated for all variables using the full information maximum likelihood (FIML) estimation method. FIML retains cases that are missing data, thus avoiding the biased parameter estimates that can occur with pairwise or listwise deletion (Schafer & Graham, 2002).

Measures

All measures were assessed at both time points with the exception of the three demographics, which were measured at Time 1.

Demographics. Age, sex, and parental education (one item per parent, using a scale from 1 = *did not finish high school* to 6 = *completed a professional or graduate degree*, which was averaged across both parents) were assessed and used as covariates in the analyses.

Affinity for aloneness (AFA). AFA was assessed using three items adapted from Burger (1995; i.e., “time spent alone is important to me”, “I like to go off on my own”, and “I enjoy being by myself”). Participants responded to these items on a four-point Likert scale ranging from 1 = *almost never* to 4 = *almost always*, such that higher scores

indicated higher levels of AFA. Cronbach's alphas for this scale were 0.63 and 0.66 among children (at Times 1 and 2, respectively), and 0.77 and 0.78 among early adolescents (at Times 1 and 2, respectively).

Social anxiety (SA). Four items from the Social Anxiety Scale for Children – Revised (SASC-R; La Greca and Stone, 1993) were used to assess symptoms of SA. These items (e.g., “I am afraid other students my age will not like me”, “I am quiet when I am with a group of other students my age”) were measured on a 4-point Likert scale ranging from 1 = *almost never* to 4 = *almost always*. Higher scores indicated higher levels of SA. At Times 1 and 2, respectively, Cronbach's alphas for this scale were 0.68 and 0.65 for the children, and 0.79 and 0.76 for the early adolescents. Previous research has indicated that the SASC-R is both reliable and valid (La Greca & Stone, 1993; Reijntjes, Dekovic, & Telch, 2007).

Peer victimization. Peer victimization was assessed by asking participants “since the beginning of this past summer, how many times have these things been done to you?”. Participants were then provided with a list of 12 different examples of peer victimization (e.g., “been teased or made fun of”, “been sworn at or called names”) and asked to respond to each on a scale ranging from 1 = *almost never* to 5 = *almost every day*, with greater scores indicating more peer victimization. Cronbach's alphas for this scale were 0.87 and 0.88 among children (at Times 1 and 2, respectively), and 0.87 and 0.89 among early adolescents (at Times 1 and 2, respectively).

Friendship quality. This variable was assessed using 10 items from the Inventory of Parent and Peer Attachment – Revised (IPPA-R; Armsden and Greenberg, 1987; Gullone and Robinson, 2005). Participants responded to items (e.g., “my friends

accept me as I am”, “my friends care about my point of view”) on a 4-point Likert scale ranging from 1 = *almost never* to 4 = *almost always*. Higher scores indicated greater friendship quality. The IPPA-R has been found to be valid and reliable in previous research (Formoso, Gonzales, & Aiken, 2000; Gullone & Robinson, 2005). At Times 1 and 2, respectively, Cronbach’s alphas for this scale were 0.71 and 0.76 for the children, and 0.81 and 0.85 for the early adolescents.

Self-esteem. Five items from the Rosenberg Self-Esteem (RSE; Rosenberg, 1979) scale were used to measure self-esteem. Example items included: “I feel that I have a number of good qualities”, and “I take a positive attitude towards myself”. These items were answered on a 4-point Likert scale ranging from 1 = *almost never* to 4 = *almost always*, such that higher scores represented higher self-esteem. The RSE has good reliability and validity (Bagley & Mallick, 2001). Cronbach’s alphas for this scale were 0.68 and 0.77 among children (at Times 1 and 2, respectively), and 0.83 and 0.86 among early adolescents (at Times 1 and 2, respectively).

Depressive symptoms. Depressive symptoms were measured using 7 items from the Center for Epidemiologic Studies Depression Scale for Children (Weissman, Orvaschel, & Padian, 1980). Response options for these items (e.g., “I felt sad”, “I was bothered by things that usually don’t bother me”) ranged from 1 = *not at all* to 4 = *a lot of the time*. Greater scores were indicative of higher levels of depression. At Times 1 and 2, respectively, Cronbach’s alphas for this scale were 0.74 and 0.81 for the children, and 0.81 and 0.84 for the early adolescents. Past research has indicated that this scale is both reliable and valid (Fendrich, Weissman, & Warner, 1990).

Plan of Analysis

Latent class analyses (LCAs) were conducted separately for the children and early adolescents at both Time 1 and 2 using Mplus 7 (Muthén & Muthén, 2012). The three AFA and four SA items were used as latent class indicators in order to explore whether different groups of individuals could be identified based on their responses to these items. For each LCA, the variance of each item was constrained to be equal across classes, while covariances among items within classes were constrained to be zero. In order to determine the number of groups that were best represented by the data, four criteria were considered: 1) interpretability of the classes, 2) Bayesian information criterion (BIC), such that smaller values of BIC indicate a better fit model, 3) significance of the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMR- LRT), such that once non-significance is reached, the number of classes prior to non-significance is defined as the appropriate number, and 4) average latent class posterior probabilities are close to 1.00 (Nylund, Asparouhov, & Muthén, 2007). Entropy (an index of confidence that individuals belong to the correct class and that adequate separation between latent classes exist) also was examined; scores $>.80$ are good but there is no set cut-off criterion for entropy (Jung & Wickrama, 2008). After establishing the existence of latent classes at Times 1 and 2 for both the late childhood and early adolescent samples, measurement invariance across time points was examined for each sample. This analysis tests whether the conditional probabilities of items are the same (i.e., invariant) across time points. In other words, it examines whether the same number and types of classes were found at each time point (examined separately for the younger and older sample; Nylund 2007). Two latent transition analyses (LTAs) were then run (one for the both the younger and older sample) in order to examine the probabilities of

staying in, and moving to and from, each class from Time 1 to Time 2.

Class differences on the indicators of psychosocial adjustment were then examined concurrently and longitudinally for both the child and early adolescent samples. The concurrent analyses included four MANCOVAs (i.e., one for each sample at each time point), with class as the independent variable, and the four indicators of adjustment as dependent variables. Age, sex, and parental education were included in these analyses as covariates. For the longitudinal analyses, four ANCOVA's were run for each sample, with class at Time 1 as the independent variable and each indicator of adjustment at Time 2 as a dependent variable. Time 1 scores on the indicators of adjustment, along with the measures of age, sex, and parental education, were included as covariates in these analyses. Multiple comparisons were controlled for using the Bonferroni-Holm method. This method was chosen due to its conservative but powerful nature, and its ability to handle unequal group sizes (Holm, 1979).

Results

Preliminary Analyses

The means and standard deviations of the study variables (at Time 1) are presented separately for each sample in Table 1. At Time 1, correlations between study variables ranged from 0.03 (sex and age) to 0.45 (peer victimization and depressive symptoms) and -0.01 (age and SA) to -0.49 (self-esteem and depressive symptoms) among the children, and from 0.02 (age and friendship quality) to 0.46 (SA and peer victimization) and -0.03 (sex and parental education) to -0.62 (self-esteem and depressive symptoms) among the early adolescents. The correlations between AFA and SA were 0.25 and 0.26 for the late childhood sample (at Times 1 and 2, respectively),

and 0.30 and 0.22 for the early adolescent sample (at Times 1 and 2, respectively).

Table 1
Means and standard deviations of study variables.

	Children		Early Adolescents	
	M	SD	M	SD
AFA.1	2.09	0.72	2.32	0.80
AFA.2	2.21	0.71	2.44	0.70
SA.1	1.83	0.69	1.92	0.77
SA.2	1.88	0.64	1.99	0.68
Peer Victimization.1	1.66	0.62	1.62	0.55
Peer Victimization.2	1.53	0.57	1.60	0.55
Friendship Quality.1	3.10	0.52	3.11	0.53
Friendship Quality.2	3.13	0.50	3.15	0.52
Self-Esteem.1	3.09	0.57	3.10	0.64
Self-Esteem.2	3.16	0.58	3.05	0.65
Depressive Symptoms.1	1.72	0.56	1.73	0.59
Depressive Symptoms.2	1.70	0.57	1.80	0.58
Sex.1 (% female)	47.76%		51.51%	
Parent Education.1	3.97	0.69	3.98	0.66
Age.1	9.29	0.93	12.20	0.92

Note. Numbers 1 and 2 indicate Times 1 and 2, respectively. AFA = affinity for aloneness, SA = social anxiety.

In terms of the stability of our measures across the two time points, the correlations between AFA at Times 1 and 2 were 0.43 for the children, and 0.56 for the early adolescents. For SA, these correlations were 0.53 and 0.63 (for the children and early adolescents, respectively), while values for the adjustment indicators ranged from 0.41 (friendship quality) to 0.57 (self-esteem) in the late childhood sample, and from 0.51 (friendship quality) to 0.67 (self-esteem) in the early adolescent sample.

Four separate MANOVAs were conducted to determine whether there were sex differences on any of the study variables for the late childhood and early adolescent samples at Times 1 and 2. A significant multivariate main effect of sex was found across

all four MANOVAs (all Wilk's λ 's < .001). In the late childhood sample, significant main effects of sex on peer victimization and friendship quality were found at both time points ($ps < .005$), such that boys consistently reported greater peer victimization and lower friendship quality than girls. In addition, a main effect of sex on SA was found at Time 2 ($p = .045$), with girls reporting higher scores than boys. For the early adolescent sample, significant main effects of sex were found at both time points for friendship quality, depressive symptoms, AFA, and SA ($ps < .016$). Results were consistent at both time points, with boys reporting lower levels of friendship quality, depressive symptoms, AFA, and SA than girls. A main effect of sex on self-esteem was also found at Time 2 for this sample ($p = .011$), such that girls reported lower scores than boys.

Primary Analyses

Extraction of latent classes. Both of the LCAs for the late childhood sample (i.e., Times 1 and 2) were conducted for 1-5 classes. In both instances, 4 classes were chosen as the best solution (see Tables 2 and 3). Both LCAs produced the lowest BIC values at 4 classes and the LMR-LRTs were significant at 4 classes but not at 5, indicating that the 4-class solution was a better fit than the 5-class solution (and also the 3-class solution). Moreover, for both LCAs, entropy values were greater than 0.80 and average latent class posterior probabilities were close to 1. The observed classes at Time 1 were strikingly similar to the observed classes at Time 2 (see Figure 1), and thus classes were labeled with the same names at both time points (see Tables 4 and 5 for item means used to label each class). Each class was characterized as follows: HighAFA/LowModerateSA (4.66% of sample at Time 1, 10.22% of sample at Time 2) – hereafter called the *AFA* group; LowAFA/LowSA (56.51% of sample at Time 1, 42.99

% of sample at Time 2) – i.e. the *Normative* group; LowModerateAFA/LowModerateSA (23.58% of sample at Time 1, 27.33% of sample at Time 2) – i.e., the *Low-Moderate* group; and ModerateAFA/ModerateHigh SA (15.25% of sample at Time 1, 19.46% of sample at Time 2) – i.e., the *Moderate-High* group.

Table 2

Latent class analysis (LCA) fit indices for the late childhood sample at Time 1.

Number of Classes	BIC	Entropy	Conditional Probabilities	LMR-LRT	Loglikelihood <i>p</i> -value
2 Classes	9797.300	.910	.948-.981	-5160.358	<.001
3 Classes	9688.512	.884	.925-.955	-4828.339	.005
4 Classes	9386.364	.905	.925-.982	-4627.382	.024
5 Classes	9490.422	.885	.834-.979	-4653.143	.083

Note. BIC = Bayesian information criterion. LMR-LRT = Lo-Mendell-Rubin Adjusted Likelihood Ratio Test.

Table 3

LCA fit indices for the late childhood sample at Time 2.

Number of Classes	BIC	Entropy	Conditional Probabilities	LMR-LRT	Loglikelihood <i>p</i> -value
2 Classes	9374.387	.856	.911-.965	-4887.916	<.001
3 Classes	9115.800	.915	.819-.928	-4617.645	.005
4 Classes	9039.328	.878	.826-.986	-4463.061	<.001
5 Classes	9054.615	.880	.819-.938	-4399.535	.137

Note. BIC = Bayesian information criterion. LMR-LRT = Lo-Mendell-Rubin Adjusted Likelihood Ratio Test.

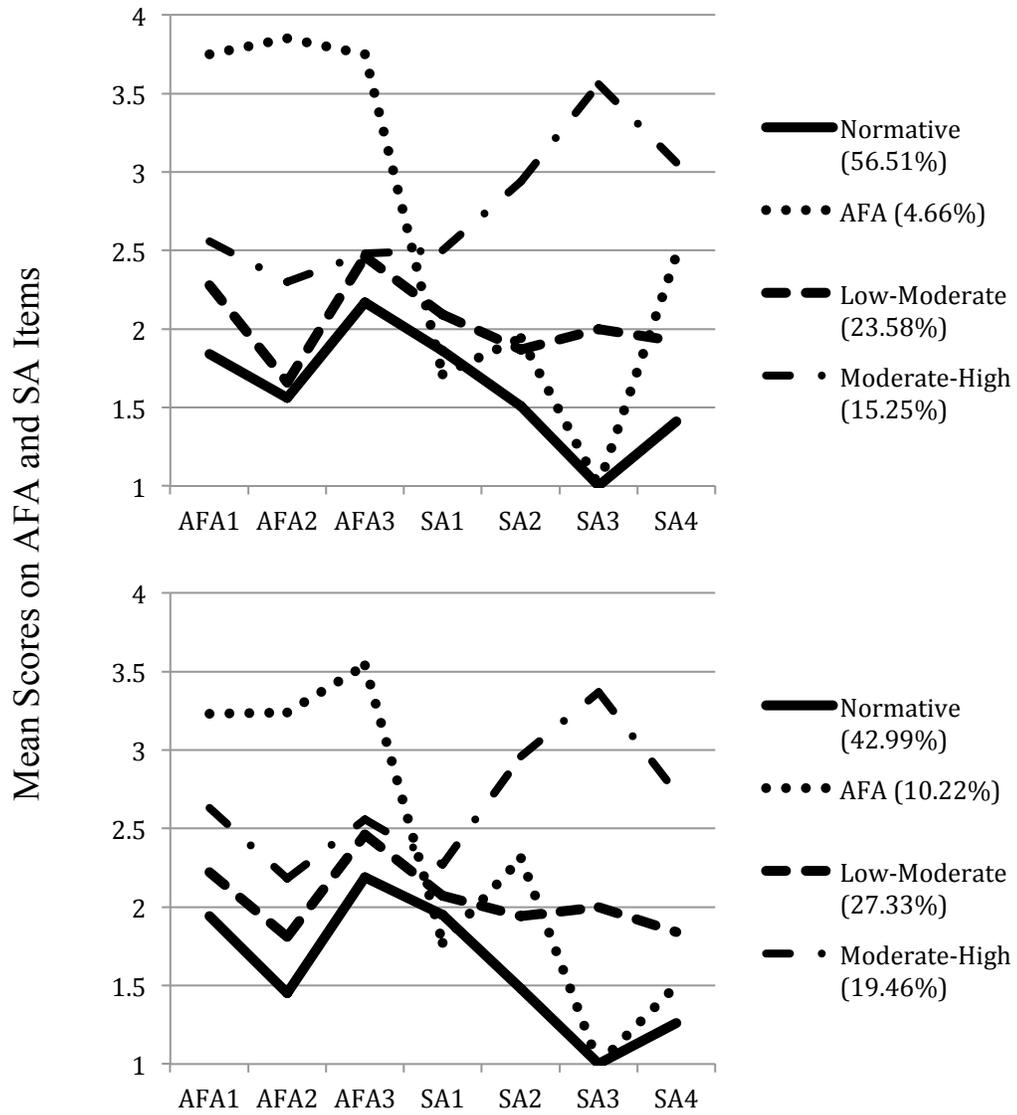


Fig. 1 Results of latent class analyses (LCAs) for the late childhood sample at Time 1 (grades 3-5; top chart) and Time 2 (grades 4-6; bottom chart). AFA = affinity for aloneness. SA = social anxiety.

Table 4

Group means and standard deviations for LCA items (late childhood sample at Time 1).

	Group 1 Normative 56.51%	Group 2 AFA 4.66%	Group 3 Low-Moderate 23.58%	Group 4 Moderate-High 15.25%
<i>Items</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
AFA1	1.84 _a (0.80)	3.75 _b (0.55)	2.28 _c (0.97)	2.56 _c (1.17)
AFA2	1.56 _a (0.74)	3.85 _b (0.36)	1.66 _a (0.85)	2.30 _c (1.15)
AFA3	2.17 _a (1.06)	3.75 _b (0.55)	2.46 _a (1.09)	2.48 _a (1.25)
SA1	1.86 _a (0.94)	1.71 _a (0.92)	2.09 _a (0.89)	2.50 _b (1.02)
SA2	1.51 _a (0.74)	1.94 _{a,b} (1.02)	1.87 _b (0.91)	2.94 _c (1.15)
SA3	1.00 _a (0.00)	1.00 _a (0.00)	2.00 _b (0.45)	3.56 _c (0.49)
SA4	1.41 _a (0.74)	2.47 _{b,c} (1.32)	1.92 _b (0.95)	3.06 _c (1.17)

Note. AFA = affinity for aloneness. SA = social anxiety. Means within the same row that share subscripts are not significantly different. AFA1=Time spent alone is important to me; AFA2=I like to go off on my own; AFA3=I enjoy being by myself; SA1=I am quiet when I am with a group of other students my age; SA2= I feel that other students my age talk about me behind my back; SA3= I am afraid other students my age will not like me; SA4= I worry about being teased.

Table 5

Group means and standard deviations for LCA items (late childhood sample at Time 2).

	Group 1 Normative 42.99%	Group 2 AFA 10.22%	Group 3 Low-Moderate 27.33%	Group 4 Moderate-High 19.46%
<i>Items</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
AFA1	1.94 _a (0.73)	3.23 _b (0.87)	2.22 _c (0.81)	2.63 _d (0.96)
AFA2	1.45 _a (0.60)	3.24 _b (0.86)	1.81 _c (0.85)	2.18 _d (1.02)
AFA3	2.19 _a (1.01)	3.54 _b (0.72)	2.46 _{a,c} (1.25)	1.03 _c (0.57)
SA1	1.95 _a (0.97)	1.77 _a (0.88)	2.07 _{a,b} (0.92)	2.27 _b (1.02)
SA2	1.48 _a (0.68)	2.31 _b (1.20)	1.94 _b (0.78)	2.96 _c (1.00)
SA3	1.00 _a (0.00)	1.00 _a (0.00)	2.00 _b (0.00)	3.37 _c (0.48)
SA4	1.26 _a (0.52)	1.50 _{a,b} (0.76)	1.84 _b (0.81)	2.73 _c (1.09)

Note. AFA = affinity for aloneness. SA = social anxiety. Means within the same row that share subscripts are not significantly different. AFA1=Time spent alone is important to me; AFA2=I like to go off on my own; AFA3=I enjoy being by myself; SA1=I am quiet when I am with a group of other students my age; SA2= I feel that other students my age talk about me behind my back; SA3= I am afraid other students my age will not like me; SA4= I worry about being teased.

With regards to the early adolescents, both LCAs (Times 1 and 2) were conducted for 1-5 classes. Once again, the 4-class solution was chosen as the best fit at both time points (see Tables 6 and 7). At Time 1 in this sample, the 4-class solution presented an entropy value greater than 0.80, average latent class posterior probabilities close to 1, and a significant LMR-LRT, which dropped to non-significance for the 5-class solution (indicating that the 4-class solution was a better fit than the 5- or 3-class solutions). With the exception of the 5-class solution, the BIC value was the lowest in the 4-class solution. Of note, the BIC only decreased by less than 100 when moving from the 4- to 5-class solution, whereas the decrease in the BIC from the 3- to 4-class solution was nearly twice this size. Together, these model fit statistics support the 4-class solution

as the best fit.

Table 6

LCA fit indices for the early adolescent sample at Time 1.

Number of Classes	BIC	Entropy	Conditional Probabilities	LMR-LRT	Loglikelihood <i>p</i> -value
2 Classes	9778.454	.885	.934-.974	-5290.258	<.001
3 Classes	9558.241	.822	.844-.940	-4819.046	.003
4 Classes	9380.382	.845	.858-.947	-4683.419	<.001
5 Classes	9289.064	.830	.833-.955	-4568.969	.116

Note. BIC = Bayesian information criterion. LMR-LRT = Lo-Mendell-Rubin Adjusted Likelihood Ratio Test.

Table 7

LCA fit indices for the early adolescent sample at Time 2.

Number of Classes	BIC	Entropy	Conditional Probabilities	LMR-LRT	Loglikelihood <i>p</i> -value
2 Classes	8316.668	.842	.928-.965	-4380.208	<.001
3 Classes	8127.486	.774	.870-.911	-4089.864	<.001
4 Classes	8056.484	.776	.836-.880	-3970.375	.461
5 Classes	8050.258	.770	.802-.873	-3909.975	.244

Note. BIC = Bayesian information criterion. LMR-LRT = Lo-Mendell-Rubin Adjusted Likelihood Ratio Test.

At Time 2, the BIC similarly dropped slightly (i.e., by less than 7) from the 4- to 5-class solution, whereas the drop from the 3- to 4-class solution was much larger. Moreover, the average latent class posterior probabilities were close to 1. While the LMR-LRT was non-significant, the 4-class solution provided classes that were once again very similar to the Time 1 classes for this sample (see Figure 2). Given that there was some statistical support for the 4-class solution, and given the striking similarity to

the observed classes at Time 1, we chose to go with the 4-class solution at this second time point. The classes can be characterized as follows: HighAFA/LowModerateSA (21.38% of sample at Time 1, 26.87% of sample at Time 2) – hereafter called the *AFA* group; LowAFA/LowSA (55.74% of sample at Time 1, 45.06 % of sample at Time 2) – i.e., the *Normative* group; LowAFA/ModerateHighSA (15.69% of sample at Time 1, 18.95% of sample at Time 2) – i.e., the *Conflicted* group; and HighAFA/HighSA (7.19% of sample at Time 1, 9.12% of sample at Time 2) – i.e., the *High* group. See Tables 8 and 9 for the item means used to label each class.

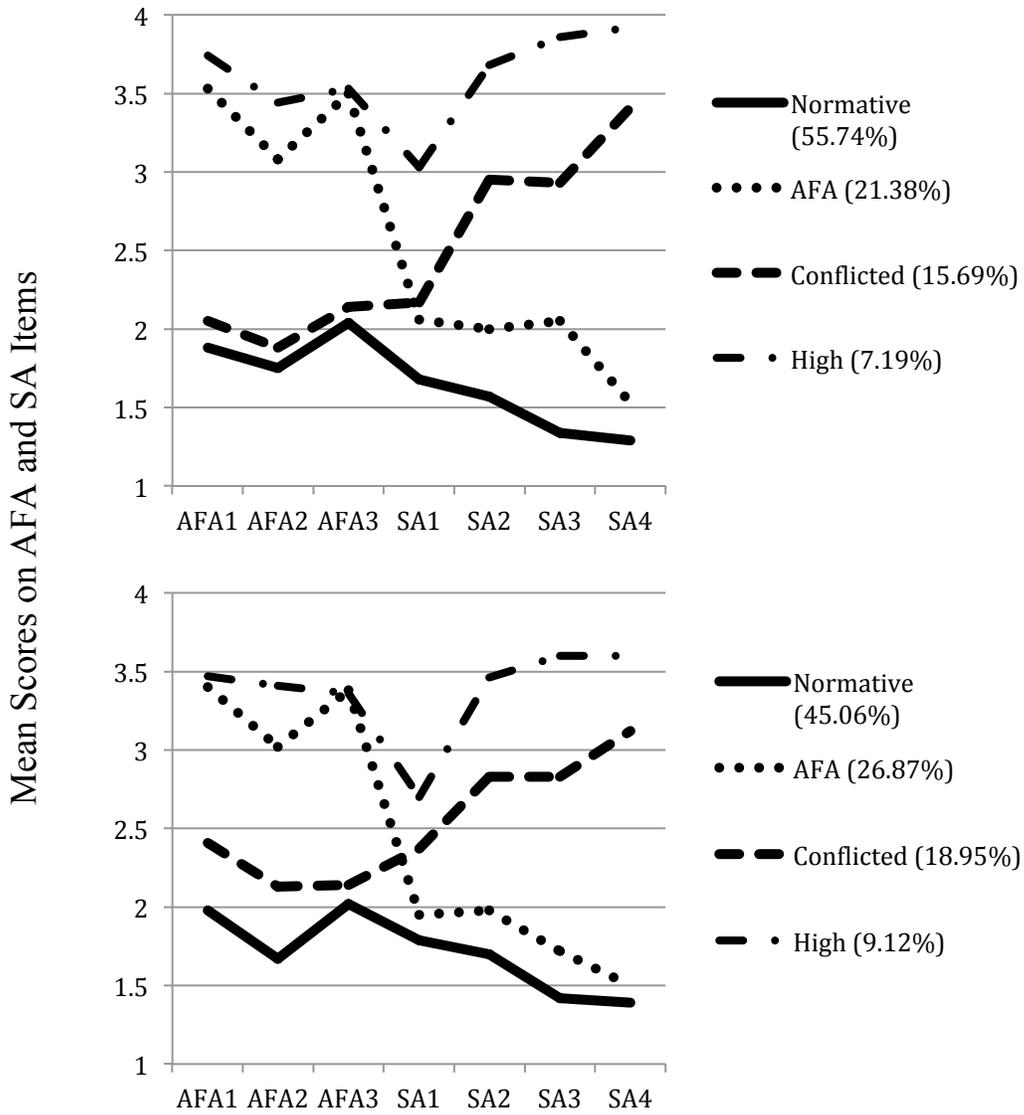


Fig. 2 Results of LCAs for the early adolescent sample at Time 1 (grades 6-8; top chart) and Time 2 (grades 7-9; bottom chart). AFA = affinity for aloneness. SA = social anxiety.

Table 8

Group means and standard deviations for LCA items (early adolescent sample at Time 1).

<i>Items</i>	Group 1	Group 2	Group 3	Group 4
	Normative 55.74% <i>M (SD)</i>	AFA 21.38% <i>M (SD)</i>	Conflicted 15.69% <i>M (SD)</i>	High 7.19% <i>M (SD)</i>
AFA1	1.88 _a (0.63)	3.53 _b (0.55)	2.05 _a (0.68)	3.75 _b (0.44)
AFA2	1.75 _a (0.74)	3.08 _b (0.92)	1.88 _a (0.72)	3.44 _b (0.74)
AFA3	2.04 _a (0.98)	3.50 _b (0.67)	2.14 _a (0.83)	3.53 _b (0.70)
SA1	1.68 _a (0.74)	2.06 _b (0.95)	2.17 _b (0.95)	3.03 _c (1.11)
SA2	1.57 _a (0.68)	2.00 _b (0.96)	2.95 _c (0.86)	3.68 _d (0.53)
SA3	1.34 _a (0.53)	2.05 _b (0.87)	2.93 _c (0.84)	3.86 _d (0.43)
SA4	1.29 _a (0.45)	1.53 _b (0.58)	3.41 _c (0.60)	3.92 _d (0.27)

Note. AFA = affinity for aloneness. SA = social anxiety. Means within the same row that share subscripts are not significantly different. AFA1=Time spent alone is important to me; AFA2=I like to go off on my own; AFA3=I enjoy being by myself; SA1=I am quiet when I am with a group of other students my age; SA2= I feel that other students my age talk about me behind my back; SA3= I am afraid other students my age will not like me; SA4= I worry about being teased.

Table 9

Group means and standard deviations for LCA items (early adolescent sample at Time 2).

<i>Items</i>	Group 1 Normative 45.06% <i>M (SD)</i>	Group 2 AFA 26.87% <i>M (SD)</i>	Group 3 Conflicted 18.95% <i>M (SD)</i>	Group 4 High 9.12% <i>M (SD)</i>
AFA1	1.98 _a (0.57)	3.40 _b (0.63)	2.41 _c (0.63)	3.47 _b (0.61)
AFA2	1.67 _a (0.56)	3.02 _b (0.77)	2.13 _c (0.71)	3.41 _d (0.78)
AFA3	2.02 _a (0.85)	3.38 _b (0.68)	2.14 _a (0.75)	3.36 _b (0.82)
SA1	1.79 _a (0.79)	1.95 _a (0.85)	2.37 _b (0.80)	2.70 _b (1.11)
SA2	1.70 _a (0.73)	1.98 _b (0.87)	2.83 _c (0.88)	3.46 _d (0.75)
SA3	1.42 _a (0.58)	1.72 _b (0.71)	2.83 _c (0.78)	3.60 _d (0.67)
SA4	1.39 _a (0.51)	1.50 _a (0.59)	3.12 _b (0.64)	3.60 _c (0.63)

Note. AFA = affinity for aloneness. SA = social anxiety. Means within the same row that share subscripts are not significantly different. AFA1=Time spent alone is important to me; AFA2=I like to go off on my own; AFA3=I enjoy being by myself; SA1=I am quiet when I am with a group of other students my age; SA2= I feel that other students my age talk about me behind my back; SA3= I am afraid other students my age will not like me; SA4= I worry about being teased.

Latent transition analyses (LTA). After establishing the existence of four latent classes at each time point for both the late childhood and early adolescent samples, LTAs were used to explore transitions between classes across the two time points. Measurement invariance was tested for each sample by comparing a model where the classes were constrained to be equal at both time points to a model where the classes were free to vary across time points. In the constrained model, corresponding item means were constrained to be equal across time points (within corresponding classes). In the late childhood sample, a chi-square difference test indicated that the constrained and unconstrained models were significantly different, $\chi^2(28) = 90.39, p < .05$. However, we

elected to proceed with the invariant model for the following reasons: First, there is a remarkable similarity between the structure of the classes at Times 1 and 2 (see Figure 1). Second, measurement invariance is often assumed in LTA, as a more accurate interpretation of transition probabilities is made possible when the number and structure of classes are held constant across time. Indeed, Nylund et al. (2006) and Pan et al. (2017) both assumed measurement invariance despite finding significant differences between their constrained and unconstrained models. Of note, measurement invariance was found in our early adolescent sample as a chi-square difference test indicated that the constrained and unconstrained models did not significantly differ from one another, $\chi^2(28) = 39.58, p > .05$. Thus, measurement invariance was obtained for the early adolescent sample.

Transition probabilities, which indicate the probability of transitioning from one class to another over time (or staying in the same class over time), are displayed for the late childhood sample in Table 10. These results indicated that there was a substantial amount of movement between groups over time. Nonetheless, the probabilities for children staying in the same groups over time were higher, for the most part, than the probabilities for movement between groups. In terms of movement between groups, no distinct pattern appeared to emerge as the most common. However, the least likely transitions were those that involved movement into the Moderate-High group.

Compared to the children, the transition probabilities for the early adolescents (see Table 11) indicated much higher stability in class membership across the two time points. For this sample, the greatest level of stability was found for the AFA group. Moreover, these probabilities generally were much higher than the probabilities that

indicated movement between classes over time. However, some specific movements between classes were notably more likely to occur than others. The greatest transition probabilities for movement between classes occurred for movement from the Normative group to the AFA group, from the High group to the Conflicted group, and from the Conflicted group to the Normative group.

Table 10
Transition probabilities from latent transition analysis (late childhood sample).

	Normative (T2)	AFA (T2)	Low-Moderate (T2)	Moderate-High (T2)
Normative (T1)	0.548	0.103	0.250	0.099
AFA (T1)	0.220	0.363	0.273	0.144
Low-Moderate (T1)	0.356	0.046	0.348	0.250
Moderate-High (T1)	0.168	0.116	0.243	0.473

Note. Percentages indicate the proportion of the sample belonging to each mover or stayer group. T1 and T2 = Time 1 and 2, respectively.

Table 11
Transition probabilities from latent transition analysis (early adolescent sample).

	Normative (T2)	AFA (T2)	Conflicted (T2)	High (T2)
Normative (T1)	0.721	0.202	0.069	0.007
AFA (T1)	0.042	0.744	0.186	0.028
Conflicted (T1)	0.246	0.093	0.585	0.076
High (T1)	0.033	0.084	0.290	0.592

Note. Percentages indicate the proportion of the sample belonging to each mover or stayer group. T1 and T2 = Time 1 and 2, respectively.

Differences among classes on psychosocial indices. Concurrent relations

between class membership and psychosocial adjustment indices are shown in Tables 12-

15. Children in the Moderate-High group, and early adolescents in the Conflicted and High groups consistently reported significantly more negative psychosocial functioning than those in the respective normative groups ($ps < .05$). Children in the Moderate-High group, and early adolescents in the Conflicted and High groups also reported significantly more negative psychosocial functioning than those in the respective AFA groups ($ps < .05$). Although the AFA and Normative groups did not differ on the indices of psychosocial adjustment in several instances, there were some instances where the AFA group reported more negative psychosocial adjustment than the Normative group (e.g., greater depressive symptoms in the younger sample at Time 1; $p < .05$). Given that concurrent relationships were not of primary interest in this study, readers are encouraged to refer to Tables 12-15 for a more detailed presentation of results from these analyses.

Table 12
Estimated marginal means & standard errors for Time 1 adjustment indicators by function of Time 1 class (late childhood sample).

	Normative	AFA	Low-Moderate	Moderate-High
Peer Victimization	1.53 _a (0.03)	1.61 _{a,b} (0.12)	1.75 _b (0.05)	2.10 _c (0.06)
Friendship Quality	3.17 _a (0.02)	3.09 _{a,b} (0.11)	3.01 _b (0.04)	2.93 _b (0.05)
Self-Esteem	3.19 _a (0.02)	2.97 _{a,b} (0.11)	3.06 _a (0.04)	2.78 _b (0.05)
Depressive Symptoms	1.61 _a (0.02)	1.92 _{b,c} (0.11)	1.77 _b (0.04)	2.06 _c (0.05)

Note. Standard errors are presented in brackets. Means within the same row that share subscripts are not significantly different.

Table 13

Estimated marginal means & standard errors for Time 2 adjustment indicators by function of Time 2 class (late childhood sample).

	Normative	AFA	Low-Moderate	Moderate-High
Peer Victimization	1.31 _a (0.03)	1.57 _b (0.07)	1.57 _b (0.04)	1.90 _c (0.05)
Friendship Quality	3.22 _a (0.03)	3.07 _{a,b} (0.06)	3.13 _{a,b} (0.04)	2.98 _b (0.04)
Self-Esteem	3.41 _a (0.03)	3.09 _b (0.07)	3.06 _b (0.04)	2.83 _c (0.05)
Depressive Symptoms	1.47 _a (0.03)	1.83 _{b,c} (0.07)	1.75 _b (0.04)	2.00 _c (0.05)

Note. Standard errors are presented in brackets. Means within the same row that share subscripts are not significantly different.

Table 14

Estimated marginal means & standard errors for Time 1 adjustment indicators by function of Time 1 class (early adolescent sample).

	Normative	AFA	Conflicted	High
Peer Victimization	1.46 _a (0.02)	1.65 _b (0.04)	2.04 _c (0.05)	2.08 _c (0.08)
Friendship Quality	3.21 _a (0.02)	3.06 _b (0.04)	2.93 _{b,c} (0.05)	2.82 _c (0.08)
Self-Esteem	3.29 _a (0.03)	2.95 _b (0.05)	2.87 _b (0.06)	2.43 _c (0.09)
Depressive Symptoms	1.56 _a (0.03)	1.88 _b (0.04)	1.94 _b (0.05)	2.31 _c (0.08)

Note. Standard errors are presented in brackets. Means within the same row that share subscripts are not significantly different.

Table 15
Estimated marginal means & standard errors for Time 2 adjustment indicators by function of Time 2 class (early adolescent sample).

	Normative	AFA	Conflicted	High
Peer Victimization	1.48 _a (0.03)	1.51 _a (0.04)	1.84 _b (0.05)	2.05 _b (0.08)
Friendship Quality	3.31 _a (0.03)	3.23 _a (0.04)	2.81 _b (0.05)	2.75 _b (0.08)
Self-Esteem	3.28 _a (0.03)	3.14 _a (0.04)	2.65 _b (0.06)	2.21 _c (0.09)
Depressive Symptoms	1.59 _a (0.03)	1.77 _b (0.04)	2.09 _c (0.05)	2.48 _d (0.08)

Note. Standard errors are presented in brackets. Means within the same row that share subscripts are not significantly different.

Tables 16 and 17 display the results of the longitudinal analyses. For the late childhood sample, results indicated that there was a significant main effect of Time 1 class on friendship quality [$F(3,596) = 3.46, p = .016, \eta_p^2 = .017$] and depressive symptoms [$F(3,596) = 4.15, p = .006, \eta_p^2 = .021$] at Time 2, controlling for previous scores, such that the Normative group reported significantly greater friendship quality ($p = .002$) and lower depressive symptoms ($p = .005$) than the Moderate-High group. There also was a main effect of Time 1 class on self-esteem at Time 2 [$F(3,596) = 4.43, p = .004, \eta_p^2 = .022$], with those in the Normative group reporting significantly greater self-esteem than the Low-Moderate group ($p = .003$) and the Moderate-High group ($p = .011$). There was no significant main effect of Time 1 class on Time 2 peer victimization in this sample [$F(3,596) = 0.921, p = .430, \eta_p^2 = .005$]. Of note, children in the AFA group did not differ significantly from any of the other groups on any of the indicators of adjustment.

Table 16
Estimated marginal means & standard errors for Time 2 outcomes by function of Time 1 class (late childhood sample).

	Normative	AFA	Low-Moderate	Moderate-High
Peer Victimization	1.50 _a (0.02)	1.63 _a (0.10)	1.57 _a (0.04)	1.53 _a (0.05)
Friendship Quality	3.17 _a (0.02)	3.05 _{a,b} (0.10)	3.14 _{a,b} (0.04)	3.01 _b (0.04)
Self-Esteem	3.22 _a (0.02)	3.06 _{a,b} (0.10)	3.08 _b (0.04)	3.07 _b (0.05)
Depressive Symptoms	1.64 _a (0.02)	1.84 _{a,b} (0.11)	1.76 _{a,b} (0.04)	1.82 _b (0.05)

Note. Standard errors are presented in brackets. Means within the same row that share subscripts are not significantly different.

Table 17
Estimated marginal means & standard errors for Time 2 outcomes by function of Time 1 class (early adolescent sample).

	Normative	AFA	Conflicted	High
Peer Victimization	1.54 _a (0.02)	1.66 _{a,b} (0.04)	1.68 _{a,b} (0.05)	1.78 _b (0.07)
Friendship Quality	3.21 _a (0.02)	3.12 _{a,b} (0.04)	3.05 _b (0.04)	2.94 _b (0.07)
Self-Esteem	3.12 _a (0.02)	3.05 _a (0.04)	2.88 _b (0.05)	2.67 _c (0.08)
Depressive Symptoms	1.73 _a (0.02)	1.84 _{a,b} (0.04)	1.93 _{b,c} (0.05)	2.08 _c (0.08)

Note. Standard errors are presented in brackets. Means within the same row that share subscripts are not significantly different.

In terms of the early adolescents, a significant main effect of Time 1 class was found at Time 2 for peer victimization, $F(3,589) = 4.30, p = .005, \eta_p^2 = .022$; friendship quality. $F(3,589) = 5.58, p = .001, \eta_p^2 = .028$; depressive symptoms, $F(3,589) = 8.02, p < .001, \eta_p^2 = .040$; and self-esteem $F(3,589) = 12.38, p < .001, \eta_p^2 = .060$. Posthoc analyses indicated that the Normative group reported significantly lower peer-victimization ($p =$

.004), greater friendship quality ($p = .001$), lower depressive symptoms ($p < .001$), and greater self-esteem ($p < .001$) than the High group. The normative group also reported significantly greater friendship quality ($p = .004$), lower depressive symptoms ($p = .001$), and greater self-esteem ($p = .013$) than the Conflicted group. The AFA group reported significantly lower depressive symptoms ($p = .007$) and greater self-esteem ($p < .001$) than the High group, and greater self-esteem ($p = .013$) than the Conflicted group. Finally, the Conflicted group reported greater self-esteem ($p = .022$) than the High group. Of note, individuals in the AFA group did not differ significantly from the Normative group on any of the adjustment variables.

Discussion

The current study sought to provide a detailed understanding of AFA in both late childhood and early adolescence given that this construct has been largely unexamined in these populations. Indeed, previous researchers have not investigated how common AFA is in childhood compared to early adolescence. There also has been no work examining whether some individuals are more likely than others to develop an AFA as they age. Finally, SA had not been accounted for in previous studies of AFA, and longitudinal work was needed in order to assess change over time in the psychosocial adjustment of individuals with an AFA.

Our results supported the existence of an AFA group (i.e., HighAFA/LowModerateSA) among both children and early adolescents (found at both time points for each of these samples). This AFA group best resembles the way researchers have thought of AFA, as these individuals reported that they enjoyed being alone but they also had relatively low levels of SA. The difference in the size of the AFA

groups between the child and early adolescent samples, however, was striking. At Time 1, this group constituted 4.66% of the late childhood sample, but 21.38% of the early adolescent sample. This difference in prevalence suggests that time spent alone may become more enjoyable and important in early adolescence. One potential explanation for this is that adolescents may be granted more opportunities to spend time alone than children are, and as such, may come to appreciate this time alone. Further, time spent alone may provide adolescents with the opportunity to pursue their own interests (e.g., reading books, playing instruments or video games; Goossens, 2013). Nonetheless, future research is needed to further address the question of why some adolescents enjoy being alone.

The idea that AFA may become more common as youth age was further supported by our finding that the AFA group increased in size from Time 1 to Time 2 in both samples. Given that relatively little is known about which individuals are most (or least) likely to become a member of this group, we examined transitions into this group across time. For the late childhood sample, there didn't appear to be one clear pattern of movement into this group. However, for the early adolescents, the most common transition into this group at Time 2 was for those who were in the Normative group at Time 1. We chose to label this group as the "Normative" group because of the size of the group, as well as conceptually, as one might expect that typical youth would not possess a strong desire to be alone or exhibit high levels of SA. Thus, our data suggest that it is more likely for a Normative early adolescent to move into the AFA group than it is for a potentially at-risk (i.e., highly socially anxious) early adolescent. This finding supports the possibility that during early adolescence, not all enjoyment of solitude is pathological

in nature. Indeed, those who develop an enjoyment of solitude that is not accompanied by SA appear to be quite normative in nature.

Further evidence of the potentially non-pathological nature of this enjoyment of solitude was found in our longitudinal analyses concerning the psychosocial adjustment of the AFA group. Indeed, in both samples, individuals in the AFA group did not differ from those in the Normative group on any of our longitudinal indicators of adjustment. Furthermore, in the early adolescent sample, we found evidence of greater self-esteem and lower depressive symptoms in the AFA group relative to the High group, and greater self-esteem than the Conflicted group. When examining Tables 16 and 17, it quickly becomes clear that the higher a group is in terms of their SA, the more negatively adjusted they are relative to the other groups. This pattern of effects also was found for our concurrent analyses (note that in the concurrent analyses, however, the AFA and normative groups did differ significantly on some of the indices of adjustment, likely due to these analyses not controlling for previous adjustment scores, and in the case of the early adolescent sample at Time 1, the AFA group being significantly higher in SA than the Normative group, although significantly lower in SA than the other two groups).¹

Together, these findings suggest that during late childhood and early adolescence, individuals who like to be alone but aren't particularly socially anxious generally are as well-adjusted as the Normative group and often better adjusted than those with relatively high levels of SA. These results are particularly noteworthy given that researchers have suggested the negative implications of enjoying solitude may increase at these life stages

¹ Additional analyses supported this possibility by indicating that among the early adolescents at Time 1, the AFA and Normative groups were, in fact, no longer significantly different from one another (on any of the indices of adjustment) when SA was included as a covariate.

(Coplan et al., 2018). However, our results indicate that SA plays a large role in determining whether the implications of enjoying time spent alone are negative or not. Conceptually, this makes sense as SA has been shown to be negatively related to well-being (Siegel et al., 2009; van Zalk & van Zalk, 2019). As such, these findings emphasize the importance of taking SA into account when studying individuals who enjoy being alone. Not doing so may lead to normal behaviour being pathologized through the conflation of socially anxious individuals with those who are not socially anxious. By not recognizing that individuals who enjoy being alone are likely a heterogeneous group, researchers may obtain results that incorrectly paint a negative picture for all individuals with an AFA. In turn, this could create potentially unnecessary concerns among parents, teachers, etc. when they observe a child or adolescent spending time on their own.

Our analyses revealed several other interesting findings that require further consideration. For one, we found the existence of a group characterized by HighAFA/HighSA (i.e., the *High* group) only in the early adolescent sample. This finding supports the suggestion among developmental psychologists and neuroscientists that adolescents, compared to children, may be particularly sensitive to peers (Burnett, Sebastian, Cohen Kadosh, & Blakemore, 2011; Casey, 2015; Gardner & Steinberg, 2005). For some individuals, this may produce feelings of SA. Further, some of these individuals may then begin to enjoy spending time alone because it allows them to avoid anxiety-evoking social situations. Another potential explanation for this finding comes from research indicating that peer victimization peaks in early adolescence (Borg, 1999; Smetana, Campione-Barr, & Metzger, 2005). As such, individuals who are victimized

may develop SA (see Siegel et al., 2009) and may begin to enjoy being alone given that their social experiences may have been negative in nature.

Another noteworthy finding comes from our examination of the stabilities in the latent transition analyses. In the late childhood sample, stability levels were relatively low, indicating that a substantial portion of children moved into a group at Time 2 that was different than their Time 1 group. However, stability levels were much higher among the early adolescents. Past research has indicated that personality typically becomes increasingly stable with age (Caspi, Roberts, & Shiner, 2005; Soto & Tackett, 2015), and this may help to explain this finding. The latent transition analyses also revealed that transitions into high SA groups from the Normative and AFA groups were quite uncommon. While some individuals may experience large increases in SA over the course of a year, we wouldn't expect this to be common. Thus, this finding is relatively unsurprising. Moreover, it appears to validate the idea that groups with high levels of SA represent the less common, more at-risk youth. Future research is needed, however, to examine why some youth do transition into these high SA groups. Perhaps these transitions are a result of victimization by peers, or the experience of other traumatic events. These possibilities will hopefully be explored further in future research.

While our study possesses a number of strengths, including a large sample size, the use of longitudinal data for both children and early adolescents, and the use of a person-centered analysis in order to account for SA, some limitations are worth noting. First, our data was collected through the use of self-report measures, and therefore, participants' responses could have been impacted by personal biases or social desirability. Nonetheless, participants' perceptions play a large role in their behaviour

and experiences and thus, self-report data is important to examine. Second, our measures did not include an assessment of the actual amount of time individuals spend alone, but rather their evaluations or attitudes towards spending time alone. Previous research has indicated that social withdrawal, or the actual behaviour of removing oneself from social situations, may be associated with problems in the domain of peer relationships (Coplan et al., 2013; Coplan, Ooi, & Rose-Krasnor, 2015). Thus, it would be beneficial to take this variable into consideration in future studies and examine whether the amount of time spent alone plays a role in predicting adjustment. Third, given that this study focused on individuals who *enjoy* solitude, it is likely that this group also included those who *prefer* solitude over being with others. It would be of great value to separate these groups of individuals in order to examine whether psychosocial adjustment differs between the two. Fourth, it is possible that there are some positive implications of having an AFA that were unexamined in this study [e.g., identity development, academic achievement, creativity, or development of hobbies and special interests (e.g., music, sports)]. Investigating these relationships would likely provide a more detailed understanding of the implications of having an AFA during these early stages of life. Finally, given that our data was collected from a Western sample, it is unclear whether our results would generalize to other cultures. Research on preference for solitude has indicated that the implications of this preference may be more negative among youth from Eastern compared to Western cultures (e.g., lower sense of general self-worth; see Liu et al., 2015).

Despite the noted limitations, the current study provides a more thorough understanding of children and early adolescents who enjoy being alone. Through

separating individuals into groups based on their varying levels of AFA and SA, examining both the prevalence and the movement/stability associated with these groups, and considering how these groups are adjusting relative to one another, the present work has provided valuable and novel insights regarding youth who enjoy being alone. Perhaps most notably, our results stress the importance of accounting for SA both when forming theories about AFA, and when measuring the construct. Indeed, the findings from this study indicate that not only do levels of SA vary across youth with an AFA, but also that SA is largely related to the psychosocial adjustment of these individuals. Not accounting for SA in previous studies of AFA may have contributed to the discrepancy between positive conceptualizations of AFA and results that indicated that it was negatively associated with psychosocial functioning (e.g., Corsano et al., 2006). By accounting for SA in future studies of AFA, researchers will hopefully be able to further expand our knowledge of this topic, and likewise, aid in the development of comprehensive theories concerning youth with an AFA.

References

- Armsden, G. C., & Greenberg, M. T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, *16*, 427-454.
<https://doi.org/10.1007/BF02202939>
- Asendorpf, J. B. (1990). Beyond social withdrawal: Shyness, unsociability, and peer avoidance. *Human Development*, *33*, 250-259. <https://doi.org/10.1159/000276522>
- Bagley, C., & Mallick, K. (2001). Normative data and mental health construct validity for the Rosenberg Self-Esteem Scale in British adolescents. *International Journal of Adolescence and Youth*, *9*, 117-126.
<https://doi.org/10.1080/02673843.2001.9747871>
- Barstead, M. G., Smith, K. A., Laursen, B., Booth-LaForce, C., King, S., & Rubin, K. H. (2018). Shyness, preference for solitude, and adolescent internalizing: The roles of maternal, paternal, and best-friend support. *Journal of Research on Adolescence*, *28*, 488-504. <https://doi.org/10.1111/jora.12350>
- Borg, M. G. (1999). The extent and nature of bullying among primary and secondary schoolchildren. *Educational Research*, *41*, 137-153.
<https://doi.org/10.1080/0013188990410202>
- Burger, J. M. (1995). Individual differences in preference for solitude. *Journal of Research in Personality*, *29*, 85-108. <https://doi.org/10.1006/jrpe.1995.1005>
- Burnett, S., Sebastian, C., Cohen Kadosh, K., & Blakemore, S. J. (2011). The social brain in adolescence: Evidence from functional magnetic resonance imaging and behavioural studies. *Neuroscience and Biobehavioral Reviews*, *35*, 1654-1664.

<https://doi.org/10.1016/j.neubiorev.2010.10.011>

Casey, B. (2015). Beyond simple models of self-control to circuit-based accounts of adolescent behavior. *Annual Review of Psychology*, *66*, 295-319.

<https://doi.org/10.1146/annurev-psych-010814-015156>

Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology*, *56*, 453-484.

<https://doi.org/10.1146/annurev.psych.55.090902.141913>

Coplan, R. J., & Armer, M. (2007). A “multitude” of solitude: A closer look at social withdrawal and nonsocial play in early childhood. *Child Development Perspectives*, *1*, 26-32. <https://doi.org/10.1111/j.1750-8606.2007.00006.x>

Coplan, R. J., Ooi, L. L., & Baldwin, D. (2018). Does it matter when we want to Be alone? Exploring developmental timing effects in the implications of unsociability. *New Ideas in Psychology*, *53*, 47-57.

<https://doi.org/10.1016/j.newideapsych.2018.01.001>

Coplan, R. J., Ooi, L. L., & Nocita, G. (2015). When one is company and two is a crowd: Why some children prefer solitude. *Child Development Perspectives*, *9*, 133-137.

<https://doi.org/10.1111/cdep.12131>

Coplan, R. J., Ooi, L. L., & Rose-Krasnor, L. (2015). Naturalistic observations of schoolyard social participation: Marker variables for socio-emotional functioning in early adolescence. *Journal of Early Adolescence*, *35*, 628-650.

<https://doi.org/10.1177/0272431614523134>

Coplan, R. J., Rose-Krasnor, L., Weeks, M., Kingsbury, A., Kingsbury, M., & Bullock, A. (2013). Alone is a crowd: Social motivations, social withdrawal, and

- socioemotional functioning in later childhood. *Developmental Psychology*, *49*, 861-875. <https://doi.org/10.1037/a0028861>
- Corsano, P., Majorano, M., & Champretavy, L. (2006). Psychological well-being in adolescence: The contribution of interpersonal relations and experience of being alone. *Adolescence*, *41*, 341-353.
- Danneel, S., Maes, M., Vanhalst, J., Bijttebier, P., & Goossens, L. (2018). Developmental change in loneliness and attitudes toward aloneness in adolescence. *Journal of Youth and Adolescence*, *47*, 148-161. <https://doi.org/10.1007/s10964-017-0685-5>
- Fendrich, M., Weissman, M. M., & Warner, V. (1990). Screening for depressive disorder in children and adolescents: Validating the center for epidemiologic studies depression scale for children. *American Journal of Epidemiology*, *131*, 538-551. <https://doi.org/10.1093/oxfordjournals.aje.a115529>
- Formoso, D., Gonzales, N. A., & Aiken, L. S. (2000). Family conflict and children's internalizing and externalizing behavior: Protective factors. *American Journal of Community Psychology*, *28*, 175-199. <https://doi.org/10.1023/A:1005135217449>
- Gardner, M., & Steinberg, L. (2005). Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: An experimental study. *Developmental Psychology*, *41*, 625-635. <https://doi.org/10.1037/0012-1649.41.4.625>
- Goossens, L. (2013). Affinity for aloneness in adolescence and preference for solitude in childhood. In R. J. Coplan, & J. C. Bowker (Eds.), *The handbook of solitude* (pp. 150-166). New York, NY: Wiley-Blackwell.

<https://doi.org/10.1002/9781118427378.ch9>

Goossens, L., & Beyers, W. (2002). Comparing measures of childhood loneliness: Internal consistency and confirmatory factor analysis. *Journal of Clinical Child and Adolescent Psychology, 31*, 252–262.

https://doi.org/10.1207/S15374424JCCP3102_10

Goossens, L., & Marcoen, A. (1999). Adolescent loneliness, self-reflection, and identify: From individual differences to developmental processes. In K. J. Rotenberg, & S. Hymel (Eds.), *Loneliness in childhood and adolescence* (pp. 225–243). New York, NY: Cambridge University Press.

Gullone, E., & Robinson, K. (2005). The Inventory of Parent and Peer Attachment - Revised (IPPA-R) for children: A psychometric investigation. *Clinical Psychology and Psychotherapy, 12*, 67–79. <https://doi.org/10.1002/cpp.433>

Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics, 6*, 65–70. <https://doi.org/10.2307/4615733>

Howard, M. C., & Hoffman, M. E. (2018). Variable-centered, person-centered, and person-specific approaches: Where theory meets the method. *Organizational Research Methods, 21*, 846–876. <https://doi.org/10.1177/1094428117744021>

Jung, T., & Wickrama, K. A. S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Social and Personality Psychology Compass, 2*, 302–317. <https://doi.org/10.1111/j.1751-9004.2007.00054.x>

La Greca, A. M., & Stone, W. L. (1993). Social Anxiety Scale for Children-Revised: Factor structure and concurrent validity. *Journal of Clinical Child Psychology, 22*, 17–27. https://doi.org/10.1207/s15374424jccp2201_2

- Ladd, G. W., Kochenderfer-Ladd, B., Eggum, N. D., Kochel, K. P., & McConnell, E. M. (2011). Characterizing and comparing the friendships of anxious-solitary and unsociable preadolescents. *Child Development, 82*, 1434-1453.
<https://doi.org/10.1111/j.1467-8624.2011.01632.x>
- Larson, R. W. (1990). The solitary side of life: An examination of the time people spend alone from childhood to old age. *Developmental Review, 10*, 155-183.
[https://doi.org/10.1016/0273-2297\(90\)90008-R](https://doi.org/10.1016/0273-2297(90)90008-R)
- Liu, J., Chen, X., Coplan, R. J., Ding, X., Zabatany, L., & Ellis, W. (2015). Shyness and unsociability and their relations with adjustment in Chinese and Canadian children. *Journal of Cross-Cultural Psychology, 46*, 371-386.
<https://doi.org/10.1177/0022022114567537>
- Liu, J., Chen, X., Zhou, Y., Li, D., Fu, R., & Coplan, R. J. (2017). Relations of shyness-sensitivity and unsociability with adjustment in middle childhood and early adolescence in suburban Chinese children. *International Journal of Behavioral Development, 41*, 681-687. <https://doi.org/10.1177/0165025416664195>
- Maes, M., Van Den Noortgate, W., & Goossens, L. (2015). A reliability generalization study for a multidimensional loneliness scale: The Loneliness and Aloneness Scale for Children and Adolescents. *European Journal of Psychological Assessment, 31*, 294-301. <https://doi.org/10.1027/1015-5759/a000237>
- Maes, M., Vanhalst, J., Spithoven, A. W. M., Van den Noortgate, W., & Goossens, L. (2016). Loneliness and attitudes toward aloneness in adolescence: A person-centered approach. *Journal of Youth and Adolescence, 45*, 547-567.
<https://doi.org/10.1007/s10964-015-0354-5>

- Marcoen, A., & Goossens, L. (1993). Loneliness, attitude towards aloneness, and solitude: Age differences and developmental significance during adolescence. In S. Jackson, & H. Rodriguez-Tome (Eds.), *Adolescence and its social worlds* (pp. 197-228). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Marcoen, A., Goossens, L., & Caes, P. (1987). Loneliness in pre-through late adolescence: Exploring the contributions of a multidimensional approach. *Journal of Youth and Adolescence*, *16*, 561-577. <https://doi.org/10.1007/BF02138821>
- Muthén, L. K., & Muthén, B. O. (2012). Mplus (Version 7). Los Angeles, CA: Muthén & Muthén.
- Nylund, K. L. (2007). *Latent transition analysis: Modeling extensions and an application to peer victimization* (Unpublished doctoral dissertation). University of California, Los Angeles.
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*, 535-569. <https://doi.org/10.1080/10705510701575396>
- Nylund, K. L., & Muthén, B. (2006). *Stability and Instability of Peer Victimization during Middle School: Using Latent Transition Analysis with Covariates, Distal Outcomes, and Modeling Extensions*. Unpublished manuscript. <https://doi.org/10.1017/CBO9781107415324.004>
- Pan, Y., Liu, H., Lau, P., & Luo, F. (2017). A latent transition analysis of bullying and victimization in Chinese primary school students. *PLOS One*, *12*, e0182802. <https://doi.org/10.1371/journal.pone.0182802>

- Reijntjes, A., Dekovic, M., & Telch, M. J. (2007). Support for the predictive validity of the SASC-R: Linkages with reactions to an in vivo peer evaluation manipulation. *Journal of Anxiety Disorders, 21*, 903-917.
<https://doi.org/10.1016/j.janxdis.2006.10.007>
- Richaud de Minzi, M. C. (2006). Loneliness and depression in middle and late childhood: The relationship to attachment and parental styles. *The Journal of Genetic Psychology, 167*, 189–210. <https://doi.org/10.3200/gntp.167.2.189-210>
- Rosenberg, M. (1979). *Conceiving the self*. New York, NY: Basic Books.
- Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147-177. <https://doi.org/10.1037//1082-989X.7.2.147>
- Siegel, R. S., la Greca, A. M., & Harrison, H. M. (2009). Peer victimization and social anxiety in adolescents: Prospective and reciprocal relationships. *Journal of Youth and Adolescence, 38*, 1096-1109. <https://doi.org/10.1007/s10964-009-9392-1>
- Smetana, J. G., Campione-Barr, N., & Metzger, A. (2005). Adolescent development in interpersonal and societal contexts. *Annual Review of Psychology, 57*, 255-284.
<https://doi.org/10.1146/annurev.psych.57.102904.190124>
- Soto, C. J., & Tackett, J. L. (2015). Personality traits in childhood and adolescence: Structure, development, and outcomes. *Current Directions in Psychological Science, 24*, 358-362. <https://doi.org/10.1177/0963721415589345>
- Teppers, E., Klimstra, T. A., van Damme, C., Luyckx, K., Vanhalst, J., & Goossens, L. (2013). Personality traits, loneliness, and attitudes toward aloneness in adolescence. *Journal of Social and Personal Relationships, 30*, 1045-1063.
<https://doi.org/10.1177/0265407513481445>

- Teppers, E., Luyckx, K., Vanhalst, J., Klimstra, T., & Goossens, L. (2014). Attitudes towards aloneness during adolescence: A person-centred approach. *Infant and Child Development, 23*, 239-248. <https://doi.org/10.1002/icd.1856>
- van Zalk, N., & van Zalk, M. (2019). Longitudinal links between adolescent social anxiety and depressive symptoms: Testing the mediational effects of cybervictimization. *Child Psychiatry and Human Development, 50*, 186-197. <https://doi.org/10.1007/s10578-018-0829-1>
- Weissman, M. M., Orvaschel, H., & Padian, N. (1980). Children's symptom and social functioning self-report scales comparison of mothers' and children's reports. *Journal of Nervous and Mental Disease, 168*, 736-740. <https://doi.org/10.1097/00005053-198012000-00005>