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Belongingness to groups, adolescent loneliness trajectories, and their consequences

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Abstract

While loneliness for short periods of time is normal, prolonged loneliness has severe health risks. This study aims to discover what loneliness trajectories can be found in a cohort of adolescents, how belongingness to different groups may be associated with these trajectories, and the mental, physical, and academic consequences of these trajectories. Adolescents ($N = 2,765$) born in the year 2000 and attending Helsinki schools participated in annual surveys from 2013 to 2019. We conducted latent profile analyses and equality of means tests to find the number of trajectories and their associations with potential preventive and consequential factors. Our analyses resulted in six profiles: "Stable high" (4.8%), "Low becomes volatile" (8.1%), "Moderates with a 7th-grade peak" (9.3%), "Winding down" (11.9%), "Winding up" (15.5%), and "Stable low" (50.5%). In general, trajectories that started with high loneliness reported lower belongingness to groups (i.e., friends, school, hobby, home, and society) than trajectories that started with low loneliness. Adolescents following the "Stable high" loneliness trajectory reported the worst mental well-being and school burnout outcomes, but there were no associations with drug use. Belongingness to friends, school, hobbies, home, and national and international society may be more protective against loneliness than belongingness to religious communities in some areas. It would behoove adolescent health experts to investigate how groups can prevent prolonged loneliness and its consequences.

Keywords

Adolescent health, loneliness, group belongingness, psychological well-being, drug use

> *What should young people do with their lives today? Many things, obviously. But the most daring thing is to create stable communities in which the terrible disease of loneliness can be cured. —Kurt Vonnegut (Tonguette, 2020)*

It is estimated that up to one-fifth of youth experience prolonged loneliness (Qualter et al., 2015). While feeling lonely at times is normal, prolonged loneliness is harmful to mental and physical health (Maes et al., 2020; Qualter et al., 2015). For this reason, it is crucial to shed further light on different developmental trajectories of loneliness rather than stopping at the overall development. In this study, we first identify different trajectories of adolescent loneliness from 11 to 19 years old. Then, we investigate a novel predictor of loneliness trajectories, that is, belongingness to groups of different levels (e.g., from groups of friends to society) to identify which groups are the most protective against loneliness. Finally, we examine the consequences of loneliness trajectories relating to different aspects of well-being.

In their authoritative chapter on loneliness in the *Encyclopedia of Child and Adolescent Development*, Maes et al. (2020, p. 1) define loneliness as

> the unpleasant feeling that occurs when people perceive their network of social relationships to be deficient in some way, either because they have fewer relationships than they would

like to have or they think the quality of their relationships is insufficient.

It is distinct from aloneness or the objective number of people around, because it includes the perception of a deficiency in relationships and emotional pain (Laursen & Hartl, 2013). Moreover, it is juxtaposed to a preference for solitude and dissatisfaction with perceived insufficient time alone, which are positively correlated with loneliness (Coplan et al., 2019). Loneliness is theorized to have evolved as a signal to reconnect and to become vigilant to threats that must be faced alone (Cacioppo et al., 2014). It is a pressing public health concern, as loneliness and weak social relationships are associated with a 26% and 50% decrease in the likelihood of survival, respectively, resulting in harm similar to smoking and alcohol use and greater than obesity and physical inactivity (Holt-Lunstad et al., 2010, 2015).

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Adolescence is marked by developmental changes that create unique contexts for loneliness to develop. Adolescents need more autonomy and time with friends and less time with family compared to when they were younger (Laursen & Hartl, 2013). While satisfied with family as company as children, adolescents have been found to feel lonely if they are not spending time with friends when it is the perceived norm to do so, for example, on Friday and Saturday nights (Laursen & Hartl, 2013). They are also individuating themselves and building an identity, which leads to seeking new experiences. Moreover, their brains and bodies are sometimes developing at different rates, disrupting their shared experiences and interests within old friendships (Laursen & Hartl, 2013).

Not all adolescents experience the same trajectory of loneliness during their teenage years. Past studies on adolescent loneliness trajectories ($N = 129–3,165$) have identified different numbers of trajectories ranging from two to six, with five being the modal finding (Benner, 2011; Chang et al., 2023; Eccles et al., 2020; Harris et al., 2013; Hosozawa et al., 2022; Hutten et al., 2021; Ladd & Ettekal, 2013; Mueller et al., 2023; Qualter et al., 2013; Riddleston et al., 2023; Schinka et al., 2013; Schneider et al., 2023; Vanhalst et al., 2015; Vanhalst, Goossens, et al., 2013; Vanhalst, Rassart, et al., 2013). Five trajectories among 478 American adolescents were found for the same range and time intervals used in this study, that is, 6th to 12th grade (Ladd & Ettekal, 2013). This study found a moderate loneliness trajectory to be the largest (41.6%), while almost all other studies have found a stable low trajectory (27%–78%) to be the largest trajectory. Most but not all studies also find a concerning chronic high trajectory, a minority ranging from 1% to 22% across the samples. In between these, there are moderate, increasing, decreasing, and vacillating trajectories. Ages range from 6 to 21 across the studies; thus, some start before or end after adolescence. The trajectories from these studies consist of 3 to 12 timepoints and follow-ups from 6 months to 5 years. The current study is the first latent trajectory analysis in Finland and contributes one of the largest samples and one of the highest numbers of timepoints.

In longitudinal research, school transitions may influence loneliness. They may disrupt friendships by eliminating an opportunity to spend time with school friends while providing an opportunity to meet new friends. Lonely adolescents may find a school transition to be an opportunity for a fresh start, removed from reputational prejudices against them. Past quantitative research has not found any effect of school transition on loneliness (Geukens et al., 2023) or marked changes in subgroup loneliness trajectories, but the studies so far have been sparse.

Belongingness as a Predictor of Adolescents' Loneliness Trajectories

It is important to understand the antecedents of loneliness trajectories to know where to intervene to support low trajectories and prevent high trajectories. One such antecedent may revolve around belongingness, that is, "the feeling of being accepted and approved by a group or by society as a whole" (American Psychological Association, n.d.). Belongingness has been called a fundamental human need (Allen et al., 2022; Baumeister & Leary, 1995) and should be a strong predictor of one's loneliness. In other words, if one does not feel that they belong or are

accepted socially, they will most likely feel lonely. Baumeister and Leary's classic article (1995) argued that loneliness is a consequence of unfulfilled needs for belongingness. The need for belongingness has been emphasized by this and other classical social psychological theories, for example, self-determination theory's need for relatedness (Adams et al., 2017; Deci & Ryan, 1980). While belongingness is often defined broadly in the literature and has some overlap with the opposite of loneliness, it is argued to be distinct (Lim et al., 2021). In this article, we investigate a narrower conceptualization of belongingness, that is, belongingness to certain groups.

Belongingness to groups is also discussed in the context of the social identity approach to health (Haslam et al., 2018), which emphasizes the importance of social groups and psychological identification with those groups for loneliness and its health consequences. How might belongingness to different groups be related to loneliness trajectories? High belongingness to friends or school may be associated with an increasing or vacillating loneliness trajectory as adolescents transfer to new schools after sixth and ninth grades. By contrast, high belongingness to home, a religious community, an online community, a hobby club, or an organization may be related to a low stable loneliness trajectory as they are likely to be more constant. High belongingness to national communities may be less likely to be related to a high loneliness trajectory because, although there is no previous research on adolescent samples, adult immigrant samples show that belongingness to their country of residence is related to lower loneliness (Klok et al., 2017). However, belongingness to larger communities may be less related to loneliness trajectories than belongingness to smaller communities as personal connections can be lost in larger communities. Furthermore, theoretically, belongingness to larger groups should affect collective loneliness (i.e., a perceived lack of connection with groups) the most, and the measure of loneliness in the present research does not strongly tap into this concept, at least with respect to larger groups (Maes et al., 2017, 2020).

Belongingness has been linked to loneliness in past research (Arslan, 2021). However, common scales, which measure the need to belong and sense of belonging, do not compare the groups to which participants can belong; instead, these scales ask participants in varied ways about their general need to belong (Leary et al., 2013) or their belongingness to a certain group like a school (Arslan & Duru, 2017). The current study measures belongingness to groups of different levels (from groups of friends to societal groups), which allows us to investigate to which groups belongingness is most relevant to loneliness trajectories. Belongingness to different groups is a predictor of loneliness trajectories that has not been investigated before.

Consequences of Loneliness Trajectories

High and increasing loneliness trajectories can have harmful consequences that should be recognized to be anticipated and addressed. Accompanied by negative affect and cognitions, loneliness is theorized to produce these harmful health consequences by initiating neurobiological and behavioral mechanisms including impaired sleep, self-regulation, and physiological functioning (Hawkley & Cacioppo, 2010). In this article, we investigate the relationship between loneliness trajectories and the diverse domains of well-being: mental, physical, and academic.

Low loneliness trajectories have been associated with better mental well-being. Schinka et al. (2013), Harris et al. (2013), Ladd and Ettekal,(2013), Qualter et al. (2013), Vanhalst, Goossens, et al. (2013), Vanhalst, Rassart, et al. (2013), and Hutten et al. (2021) found that individuals in a stable low loneliness trajectory reported lower depression than those in high loneliness trajectories. However, all these studies were conducted in different countries with different depression measures and much smaller sample sizes than the current study. There is no research on heterogeneous adolescent loneliness trajectories and life satisfaction. A negative association has been found between life satisfaction and loneliness among adolescents in a cohort study representative of the UK (Matthews et al., 2023). This study contributes evidence about the relationship between loneliness trajectories and life satisfaction to the literature and tests whether the findings with depression replicate with another established measure of depressive symptoms in another country.

Just as loneliness can have negative effects on mental health, a link between general health problems and adolescent loneliness trajectories has been found in two studies (Harris et al., 2013; Qualter et al., 2013), but not in another (Eccles et al., 2020). Drug use, which affects physical and mental health, is a behavior adolescents may resort to when feeling lonely (Banks et al., 2023; Lees et al., 2020). Although there are no studies on associations between different loneliness trajectories and use of alcohol and other drugs, variable-centered research on loneliness suggests that higher loneliness could be related to higher use of alcohol, tobacco, and other drugs (Copeland et al., 2018; Matthews et al., 2023; McKay et al., 2017; Stickley et al., 2014), but also see Varga and Piko (2015). This study is the first to investigate relationships between adolescent loneliness trajectories and alcohol, tobacco, and other drug use.

Only one study on adolescent loneliness trajectories has investigated their effect on academic well-being. Among Latin adolescents in the US, high and increasing loneliness trajectories were negatively related to exam success (Benner, 2011). Other longitudinal research has also found a negative effect of loneliness on adolescents' educational qualifications (Matthews et al., 2023), but no consistent effect on level of education in midlife (von Soest et al., 2020). This study sheds light on the relationship between adolescent loneliness trajectories and school engagement, burnout, and grades so that educators can better anticipate the academic effects of different loneliness trajectories.

The Present Study

The present study aims to identify adolescent loneliness trajectories from approximately age 12–19 in a Finnish sample and examine a) whether belongingness to different groups predicts these trajectories and b) whether important well-being indicators, that is, satisfaction with life, depressive symptoms, drug use, school burnout and engagement and grades are associated with the loneliness trajectories. Based on past research (e.g., Schinka et al., 2013), we expected around five trajectories to be the best fit to the data with a large trajectory reporting stable low loneliness, a small trajectory reporting chronic high loneliness, and the other trajectories increasing, decreasing, or staying stable in between. We also hypothesized changes at the school transition points after sixth and ninth grades.

Furthermore, we hypothesized that higher belonging would be associated with loneliness trajectories with lower starting points. We expected this particularly among smaller groups (e.g., friends, schools, and family) as opposed to larger groups (e.g., Finnish, European, and global), as the measure of loneliness does not capture collective loneliness. Decreasing and low loneliness trajectories were expected to result in higher life satisfaction, school engagement, and grades (Benner, 2011), while high and increasing loneliness trajectories were expected to result in higher depressive symptoms (e.g., Harris et al., 2013), school burnout, and drug use (e.g., Copeland et al., 2018).

Methods

Participants and Procedure

Participants of this longitudinal study were a cohort of ($N = 2,769$) students from Helsinki schools, born in the year 2000, and surveyed annually from grade 6 (2013) through the last year of high school (2019). A total of 2,567 students consented to participate and responded to the loneliness items. Demographics are shown in Table 1. The percentage of comprehensive school students in Helsinki with a foreign background (20%) is higher than in our sample (Education, 2021). Those with Swedish as their mother tongue appear to be underrepresented as well, as 5.6% in the city are Swedish speakers (Helsinki Facts and Figures, 2019). Parental education statistics resemble the general city population except that only 42% of men have a higher degree in the general population. Between grades 6 and 7, there is an educational transition from primary school to lower secondary school, and after grade 9, there is the transition from lower to upper secondary education (either general upper secondary, i.e., the academic track, or upper secondary vocational education, i.e., the vocational track). Almost all students in the last three waves took the academic track; by 2018; however, some attended vocational school (2.1%) and some were not studying (5.7%). Parents provided their consent as well. The Education Agency of the City of Helsinki (3202) University of Helsinki Ethical Review Board in the Humanities and Social and Behavioral Sciences (20/2018) approved the study. The preregistration can be found here.

Table 1. Student-Reported Demographics.

		Percentage	
Gender *N*=2590	Girls	55%	
	Boys	40%	
	Gave another answer	5%	
Mother tongue *N*=2402	Finnish	85.7%	
	Bilingual including Finnish	1.5%	
	Swedish	0.5%	
	Other	12.3%	
		Maternal N = 715	*Paternal N* = 494
Parental Education	≤ upper secondary school	38%	38%
	> upper secondary school	58%	53%
	Other	4%	9%

Measures

Loneliness. Loneliness was measured with a short version of the UCLA Loneliness Scale (e.g., "I have a feeling that I can't rely on anyone"; Hays & DiMatteo, 1987) rated on a 4-point Likert-type scale (1 = No, 2 = Rarely, 3 = Sometimes, and 4 = Often). Due to limited availability across waves and a better reliability statistic, the item regarding extraversion was not utilized, resulting in a seven-item scale. The internal consistency of the used UCLA scale was good at all seven measurement points (α = .82–.88). Means over the years were: in 2013 (M = 1.73, SD = 0.58), 2014 (M = 1.77, SD = 0.63), 2015 (M = 1.75, SD = 0.62), 2016 (M = 1.92, SD = 0.71), 2017 (M = 1.93, SD = 0.71), 2018 (M = 1.86, SD = 0.70), and 2019 (M = 2.00, SD = 0.71).

An Antecedent of Loneliness. Belongingness to different groups has been measured in the Consumer Habits and Lifestyle in Finland survey from 1999 to 2014 and the Finnish Youth barometer since 2004. Participants are asked, "How strongly do you feel you belong to the following?" In the sixth grade, the survey queried about 13 different groups: family, friends, school, home, the place I live, borough, religious community, hobbies, organizations, social media communities, the Finnish society, Europeanism, and global citizenship. The response scale ranges from 1) "Not at all" to 5) "Very much." Variables with low correlations (at least half of the correlations below .3 for all but the school variable and no correlation above .5) were not added to the exploratory factor analysis, but utilized as single items, that is, belonging to: a group of friends (M = 4.34 SD = 0.79), hobbies (M = 4.21, SD = 1.08), school (M = 3.94, SD = 0.94), social media community (M = 3.32, SD = 1.28), organizations (M = 3.03, SD = 1.23), or religious community (M = 2.93, SD = 1.42). The exploratory factor analysis resulted in two factors: Home (i.e., family, home, place where I live, and borough; α = .80; M = 4.44, SD = 0.65) and National and International Society (i.e., Finnish society, Europeanism, global citizenship; α = .88; M = 3.80, SD = 1.06).

Consequences of Loneliness.

Mental well-being. Life satisfaction. The Satisfaction with Life Scale (Diener et al., 1985) was taken from the last wave in 2019 (α = .88; M = 4.45, SD = 1.35). The response scale for the five items (e.g., "For the most part, my life is ideal.") ranged from 1) "Completely disagree" to 7) "Completely agree." *Depressive symptoms*. The 10 items of the Depression Scale (*DEPS-10*; Salokangas et al., 1995) were used to measure depression at the last wave (α = .93; M = 1.98, SD = 0.76). Participants were asked how their mood had been during the last month (e.g., "I have not got any fun out of life") and answered on a response scale from 1 "Not at all" to 4 "Extremely."

Substance use. Three kinds of drug use were measured with three items at the last wave. Alcohol use (M = 2.95, SD = 1.26) was measured on a scale from "1. Once a week or more" to "6. I don't use alcohol." Tobacco use was measured on a scale from "1. I smoke once a day or more often" to "5. I have never smoked" (M = 4.25, SD = 1.23). Other drug use was measured with the question "Have you ever tried or used drugs or medicines for narcotic purposes?" and responses given on

a scale from "1. Never" to "4. 5 times or more" (M = 1.41, SD = 0.88).

Academic well-being. School burnout. The School Burnout Inventory (Salmela-Aro et al., 2009) was administered at the last wave (α = .90; M = 3.22, SD = 1.16). Participants were asked how much they agreed from 1 "Completely disagree" to 6 "Completely agree" to 10 items, for example, "I feel overwhelmed by my schoolwork." *School engagement.* The nine-item Schoolwork Engagement Inventory (Salmela-Aro & Upadyaya, 2012) was also administered at the last wave (α = .95; M = 4.76, SD = 1.39). Participants were asked how often on a scale from 1 "Never" to 7 "Daily" these items applied to them, for example, "I am enthusiastic about my studies." *Academic achievement.* Grades are students' cumulative grade point average (GPA) in the last year of high school and range from 4 to 10 (M = 7.89, SD = 0.91).

Statistical Analyses

In testing for longitudinal invariance with the UCLA Loneliness Scale, we compared the Standardized Root Mean Square Residuals (SRMR) rather than significance tests, as our sample was large. SRMR can be used as an effect size for model misfit and is standardized unlike root mean square error approximation (RMSEA) (Maydeu-Olivares, 2017; Shi et al., 2020). SRMR was the same for the configural and metric models (0.085) but increased with the scalar model (0.094) and the factor variance invariance model (0.254). Longitudinal latent profile analysis was used to identify the trajectories. We handled missing data with maximum likelihood estimation with robust standard errors (MLR). To fulfill the assumption of missing at random (MAR), we tested whether gender, mother tongue, minority membership, or absolute and relative perceived financial situation were associated with missingness on loneliness. Because gender, specifically self-reporting as a boy or other, and mother tongue, specifically Finnish or Somali, were associated with missingness, we also ran the analyses with covariates and found similar results.

Nine latent profile analyses were conducted for the loneliness trajectories with guidance from Nylund-Gibson and Choi (2018). The goodness-of-fit indices included were Bayesian Information Criteria (Bayesian information criterion (BIC)), Akaike Information Criteria (Akaike information criterion (AIC)), and Sample-size Adjusted BIC (SABIC), for which lower values mean superior fit; Vuong-Lo-Mendell-Rubin Likelihood Ratio Test (VLMR-LRT), Lo-Mendell-Rubin Likelihood Ratio Test (LMR-LRT), Bootstrapped Likelihood Ratio Test (BLRT) p-values (a non-significant p-value meaning k-1 classes is a better fit); Bayes factor (BF; higher means better fit) and approximate correct model probability (cmP; higher means better fit). We used full information maximum likelihood estimation with robust standard errors. To analyze how belongingness to different groups were associated with loneliness trajectories, we tested the equality of means across the trajectories using the BCH method. Using the same method, we compared the means of the outcomes depressive symptoms, life satisfaction, schoolwork engagement, school burnout, alcohol use, tobacco use, other drug use, and GPA at the last wave across loneliness trajectories. The latent profile analyses
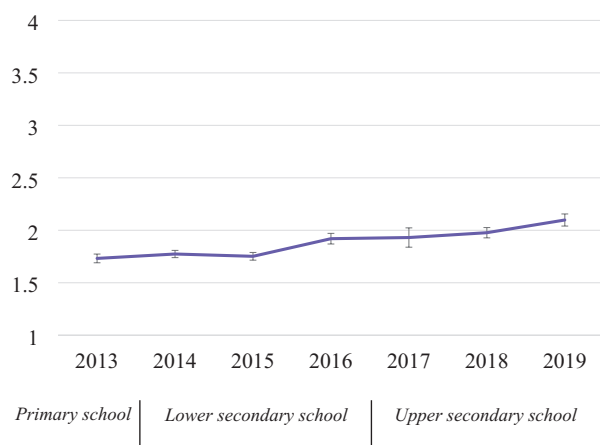
Figure 1. Overall Loneliness Development Following Adolescents Born in the Year 2000. Means with 95% confidence intervals. Response scale: 1–4. Sample sizes at different grades range from 224 to 1,280.

were conducted using Mplus Version 8.9-8.10 (Muthén & Muthén, Los Angeles, CA, USA).

Results

Overall Loneliness

From grade 6 to the last grade of upper secondary school (7 years), loneliness increased slightly and gradually (see Figure 1). Starting off below the response value "Rarely," reported loneliness increased above "Rarely." These overall means did not show significant changes during the school transitions from primary (grade 6) to lower secondary school (grade 7), $t(408) = 0.47$, $p = .642$, and from lower secondary (grade 9) to upper secondary school (grade 10), $t(130) = 0.63$, $p = .532$. After correcting for multiple comparisons with the Bonferroni correction, the only significant changes were increases between grades 8 and 9, $t(509) = 5.35$, $p < .001$, $d = .25$, and between grades 11 and 12, $t(331) = 3.88$, $p < .001$, $d = .18$. The percentage of participants with scores above 3 (meaning "sometimes") on the loneliness scale was low (2.4%–7.5% across the waves).

Diverse Loneliness Trajectories

The number of profiles that best fitted the data varied across different fit indices (see Supplementary Table 1 for fit indices and entropy.): Log-likelihood, AIC, BIC, SABIC, CAIC, AWE, and cmP suggested a nine-profile solution, BF five profiles, and LMR-LRT and VLMR-LRT two profiles. BLRT did not point to any solution. Due to these inconsistencies, we decided the number of profiles based on their interpretability and distinctiveness, ultimately selecting six profiles, which are shown in Figure 2. Entropy was low at .567. The average individual posterior probabilities for being assigned to a specific latent profile in the six-profile model were .75, .64, .74, .70, .57, and .78. This solution has a "Stable High" profile (4.8%, the smallest profile) with chronically elevated loneliness levels averaging around "sometimes." The second smallest profile (8.1%) "Low becomes volatile" starts with low

reported loneliness until grade 9 when it spikes and then vacillates. The next profile (9.3%) "Moderates with a 7th-grade peak" average experiencing loneliness only "rarely" except during their first year of lower secondary school. The subsequent profile (11.9%) "Winding down" starts with their highest reported loneliness between "rarely" and "sometimes" at grade six and gradually reports less loneliness over the years notwithstanding a small peak at grade ten. The second largest profile (15.5%) "Winding up" starts off reporting experiencing loneliness "rarely" but increases to reach a peak in the first year of high school and continues with a level of loneliness higher than at the start. By far the largest profile (50.5%), "Stable low" starts off close to no loneliness inching closer to rare loneliness by the end of high school.

The Antecedent of Belongingness to Different Groups

Table 2 presents the results of the equality of means tests with belongingness to different groups. In general, the "Stable low," "Low becomes volatile," and "Moderates with a 7th grade peak" reported higher belongingness to friends than the other trajectories (see Table 2 for more specific results). The "Winding down" and "Stable high" trajectories had lower belongingness to schools than the "Stable low" trajectory. The "Winding down," "Moderates with a 7th grade peak," and "Stable high" trajectories had lower belongingness to hobbies, home and national and international society than the "Stable low" trajectory. The "Stable high" trajectory had marginally higher belongingness to social media communities and organizations. There were no statistically significant differences with regard to belongingness to a religious community.

Consequences

Table 3 presents the equality of means tests for the consequences. The "Stable high" and "Moderates with a 7th grade peak" trajectories had the worst mental health at the end, with the lowest level of life satisfaction and highest level of depressive symptoms among the trajectories. By contrast, the "Stable low" and "Winding down" trajectories had the best mental health. Drug use did not significantly differ across trajectories. Finally, the "Stable low" and "Winding down" reported the lowest school burnout, while "Stable high" and "Winding up" reported the highest. With marginal statistical significance, the "Stable low" trajectory reported the highest schoolwork engagement, but also the lowest GPA.

Discussion

Loneliness can develop differently across adolescence. Moreover, each trajectory is preceded by different experiences and followed by different consequences. First, the current study shows how the overall trend of loneliness, which was low and slightly increasing, masked heterogeneity in trajectories. We found six adolescent loneliness trajectories and then investigated factors associated with them at the beginning and at the end. Consistent with past research (e.g., Riddleston et al., 2023), we found that about half the sample (51%) belonged to a low stable trajectory
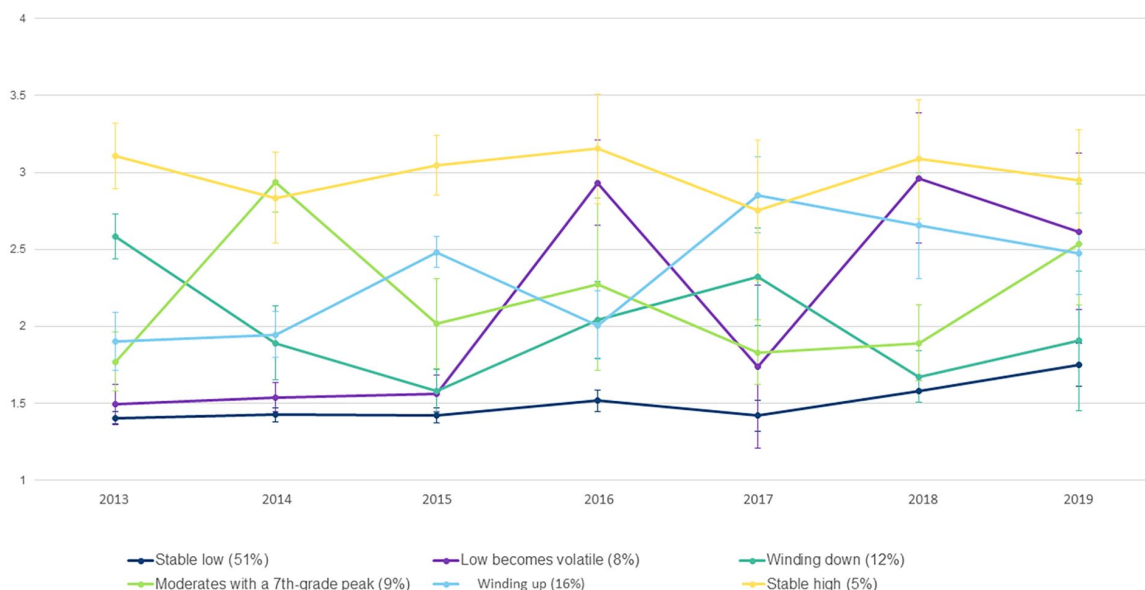
Figure 2. Six Adolescent Loneliness Trajectories. *N* = 2,567. Response scale: 1–4.

and a minority (5%) belonged to a high stable trajectory. In addition, we found four more trajectories not identified in previous studies, likely due to the limitations of their datasets (i.e., fewer waves and shorter time frames). However, a qualitative study did make note of life events, including school transitions, as potential triggers of changes in levels of loneliness (Rönkä et al., 2018) as one can lose or gain relationships in the process.

The overall trend of increased loneliness from primary to upper secondary school could be due to the increasing pressure of academic competition or the current structure of secondary schools in Finland, in which the home classroom disappears. We hypothesized that we would find changes in loneliness during the school transitions. The overall trajectory did not evince changes during the school transitions, but the latent trajectories revealed one subgroup of students with loneliness peaking after the first school transition and another after the second school transition. Finding two different trajectories suggests that there are characteristics of the different transitions that affect certain adolescents rather than some adolescents being more sensitive than others to transitions in general. In Finland, the transition from 6th to 7th grade involves less of a change in the composition of the peer network than the transition from 9th grade to upper secondary school. As upper secondary school was not compulsory, some peers dropped out or chose either the academic track or vocational school. Therefore, a spike in loneliness could be induced by the loss of friends for those whose group of friends in lower secondary school was broken up during the transition. In addition, instead of going through school days with the same teacher and same peers, teachers are different for each subject and peers change classes. The advantages of having specialized teachers and more choice and opportunities to niche-seek (Ladd & Ettekal, 2013) come with the disadvantage of having less time to bond with a teacher and peers, which can be especially difficult for the more introverted students (Godfrey & Koutsouris, 2024). The transition from 6th to 7th grade involves this kind of change but

to a lesser extent. Perhaps the nine percent of students who experienced a spike in loneliness in 7th grade went to a different school than their primary school friends and/or experienced puberty at a different age than their peers, causing a rift in their shared interests (Laursen & Hartl, 2013).

Our second aim was to examine whether and how belongingness to certain groups was related to loneliness trajectories. In general, high belongingness to groups was associated with lower loneliness trajectory starting points. Among the eight groups to which belongingness was assessed, it was belongingness to friends, school, hobbies, home, and national and international society which may have protected adolescents the most, securing them in the "Low stable" trajectory. Belongingness to hobbies, home, and national and international societies was lower for those either with stable high loneliness or loneliness that was especially high during that year or the next, suggesting that belongingness to these groups helps prevent loneliness. Home and school are two groups with which adolescents spend most of their time; therefore, belongingness at home and at school should logically have the most influence. While significant associations were found for these two groups, belongingness to friends differentiated the trajectories the most, perhaps due to the explicit mention of friends in one of the items and the importance of friends during adolescence (Laursen & Hartl, 2013). In addition, hobby belonging may be important for loneliness trajectories because belonging to hobbies is likely to be more voluntary and intrinsically motivated than belonging to other groups. This, combined with having similar interests in the hobby, may be conducive to better quality relationships.

There is a saying that "Finland is the promised land of organizations." However, the degree of involvement in an organization can vary from simply holding a membership card to being actively engaged in its activities. Therefore, belonging to an organization can mean different things. While social media use can have mixed effects on loneliness, social media communities may serve as

Table 2. Equality of Means Tests of Belongingness to Different Groups Among Latent Loneliness Trajectories.

Belongingness to:	Friends			School			A religious community			Hobbies			Organizations			Social media communities			Home			National and international society		
		95% CI			95% CI			95% CI			95% CI			95% CI			95% CI			95% CI			95% CI	
	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL
1 Stable low	5.06	4.84	5.28	4.43	4.21	4.65	3.13	2.84	3.42	4.75	4.51	4.99	3.23	2.96	3.50	3.54	3.27	3.81	4.90	4.74	5.06	4.23	3.99	4.47
2 Low becomes volatile	4.88	4.35	5.41	4.16	3.57	4.75	2.89	2.18	3.60	4.57	4.08	5.06	3.54	2.78	4.30	3.74	3.01	4.47	4.48	4.05	4.91	4.07	3.52	4.62
3 Winding down	3.68	3.48	3.88	3.53	3.29	3.77	2.65	2.36	2.94	3.88	3.63	4.13	2.85	2.58	3.12	3.00	2.69	3.31	4.06	3.88	4.24	3.49	3.25	3.73
4 Moderates with a 7th-grade peak	4.64	4.13	5.15	4.01	3.48	4.54	3.20	2.40	4.00	3.48	2.74	4.22	2.78	2.11	3.45	3.33	2.64	4.02	4.23	3.84	4.62	3.21	2.50	3.92
5 Winding up	4.29	3.62	4.96	3.71	2.93	4.49	3.30	2.20	4.40	3.69	2.63	4.75	3.05	2.21	3.89	3.61	2.61	4.61	4.53	3.94	5.12	3.78	2.94	4.62
6 Stable high	2.90	2.27	3.53	3.21	2.64	3.78	2.77	2.08	3.46	3.65	3.00	4.30	2.34	1.71	2.97	2.97	2.36	3.58	3.92	3.45	4.39	3.40	2.79	4.01
χ^2 (5)	104.08			36.40			4.08			35.67			11.41			7.61			47.84			23.36		
p	<.001			<.001			0.539			<.001			0.044			0.179			<.001			<.001		
Group comparisons	**1 > 3,5,6** **2,4 > 3** **2,4,5 > 6**			**1 > 3,6** **2 > 6**						**2 > 3,4,6** **1 > 3,4,6**			**1,2 > 6**			**1 > 3**			**1 > 3,4,6**			**1 > 3,4,6**		

Note. N = 2,567. CI = confidence interval; LL = lower limit; UL = upper limit. Response scale: 1–5. For listed group comparisons, p > .05. Bolded comparisons have a Bonferroni-corrected p-value cutoff of <.003.

Table 3. Equality of Means Tests With Consequences.

	Mental well-being						Physical well-being									Academic well-being								
	Life satisfaction			Depression			Alcohol use			Tobacco use			Other drug use			Schoolwork engagement			School burnout			GPA		
Response scale	1–7			1–4			1–5			1–5			1–4			1–7			1–6			4–10		
		95% CI			95% CI			95% CI			95% CI			95% CI			95% CI			95% CI			95% CI	
	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL	M	LL	UL
1 Stable low	5.01	4.79	5.23	1.56	1.44	1.68	3.04	2.82	3.26	4.21	4.01	4.41	1.35	1.21	1.49	4.96	4.76	5.16	2.89	2.71	3.07	7.76	7.62	7.90
2 Low becomes volatile	3.94	3.31	4.57	2.42	1.97	2.87	3.00	2.24	3.76	4.62	4.03	5.21	1.29	0.86	1.72	4.29	3.47	5.11	3.40	2.73	4.07	8.03	7.56	8.50
3 Winding down	4.98	3.94	6.02	1.53	0.94	2.12	2.63	1.65	3.61	3.86	2.88	4.84	1.50	0.66	2.34	5.13	4.01	6.25	2.19	1.23	3.15	8.06	7.32	8.80
4 Moderates with a 7th-grade peak	3.65	2.96	4.34	2.52	2.15	2.89	2.89	2.36	3.42	4.27	3.76	4.78	1.61	1.16	2.06	4.47	3.71	5.23	3.62	3.09	4.15	8.05	7.64	8.46
5 Winding up	4.39	3.90	4.88	2.18	1.93	2.43	2.97	2.52	3.42	4.23	3.82	4.64	1.50	1.19	1.81	4.80	4.31	5.29	3.84	3.45	4.23	7.94	7.65	8.23
6 Stable high	2.52	1.99	3.05	3.13	2.84	3.42	2.55	1.88	3.22	4.35	3.74	4.96	1.46	1.03	1.89	4.00	3.26	4.74	4.25	3.80	4.70	8.17	7.80	8.54
χ^2 (5)	94.74			129.71			2.84			2.64			2.57			12.00			67.40			7.58		
p	<.001			<.001			.724			.756			.766			.035			<.001			.181		
Group comparisons	1 > 2,4,5; 3 > 4; 1,2,3,4,5 > 6			6 > 1,2,3,4,5; 2,4,5 > 1; 2,4 > 3												1 > 6			4,5,6 > 1; 2,4,5,6 > 3			6 > 1		

Note. $N = 2567$. CI = confidence interval; LL = lower limit; UL = upper limit. For listed group comparisons, $p > .05$. Bolded comparisons have a Bonferroni-corrected p-value cutoff of $<.003$.

platforms for building belongingness in some cases (Smith et al., 2021). When one reports that they strongly belong to a social media community, it may especially denote the positive aspects of social media. However, at the same time, the negative aspects, for example, lacking expressions and gestures, may still be present in the social media community one belongs to, tempering the relationship with loneliness. We had expected that belongingness to the largest groups, for example, national and international society, would have fewer associations with loneliness than belongingness to smaller groups, for example, friends and hobbies, because the measure of loneliness used was not collective. Our hypothesis was partially supported: belongingness to the smallest groups, that is, friends and hobbies, had more associations with loneliness trajectories. The associations with society belongingness showed that it is still relevant to the development of loneliness despite the individualistic slant of the loneliness items. This may be due to the loneliness items that can allude to the societal level, that is, feeling secluded, like an outsider, and feeling lonely around people. However, more associations would probably be found with a measure of collective loneliness. Comparing the trajectories with the most notable change between the first 2 years ("Moderates with a 7th grade peak" increased and "Winding down" decreased), it was belongingness to friends that differentiated them. Adolescents in the "Moderates with a 7th grade peak" trajectory (who had high belongingness to friends before the transition) may have lost their group of friends in the school transition, whereas adolescents in the "Winding down" profile had lower belongingness to friends at the start. Belonging to a religious community was not associated with loneliness trajectories in our sample, possibly because Finland is not a religious country (Kivijärvi, 2023; Mitchell, 2018). While belonging to a religious community is likely to be associated with a less detrimental loneliness trajectory in most countries, strong religious belongingness might elicit feelings of exclusion from society in a place where most people are not very religious.

The low and high stable trajectories resulted in outcomes as predicted, except for grades (Benner, 2011). Those who are lonely may be studying more. If this is the case, future research could investigate whether study groups could serve the dual purpose of preventing loneliness and improving academic performance. Adolescents in the "Low becomes volatile" trajectory ended up with relatively high loneliness levels and poor mental health. This trajectory is unlike any found in past research. Those in the "Winding down" trajectory also reported better mental well-being and school burnout outcomes ending up with positive outcomes along with lowered loneliness. Past research had found lower depression in a decreasing loneliness trajectory compared to a high trajectory (Schinka et al., 2013; Vanhalst, Goossens, et al., 2013). Together with their relatively high loneliness at the end, the "Moderates with a 7th grade peak" reported relatively worse mental health and school burnout, while "Winding up" reported higher school burnout but moderate levels on other mental health indicators.

This study has important limitations. First, there was a large proportion of missing data with relatively few individuals having data at every time point. Based on our missingness analyses, we included gender and mother tongue as covariates in a sensitivity analysis. Past research has shown that gender or sex is also sometimes related to loneliness trajectories: Benner (2011) found that boys were more likely to be in the more lonely trajectories; other studies found boys were more likely to be in the less lonely trajectories (Hosozawa

et al., 2022; Riddleston et al., 2023; Schneider et al., 2023); and still other studies did not find differences by gender (Ladd & Ettekal, 2013; Mueller et al., 2023; Schinka et al., 2013; Vanhalst, Goossens, et al., 2013). Studies investigating the effects of language spoken at home or other ethnicity-related variables have not found them to be related to adolescent loneliness trajectories (Benner, 2011; Ladd & Ettekal, 2013; Mueller et al., 2023; Schinka et al., 2013). Second, this study investigated antecedents and outcomes that likely have reciprocal relationships as well. Future studies are needed to examine the reciprocal dynamics and causal associations between loneliness trajectories and their antecedents and consequences. Third, longitudinal invariance values could have been better (however see Robitzsch and Lüdtke [2023]), and entropy values were low, indicating that the accuracy of the profiles was not optimal. This uncertainty in group membership was nevertheless taken into account in our analyses of antecedents and consequences, as when using the BCH method, the latent group membership is not fixed but rather measurement error of latent class variable or uncertainty in latent group membership is taken into account.

Finally, studying the effect of group belongingness on individual loneliness ignores how outgroup well-being may be affected, for example, belongingness to one group may mean preferential treatment to one's group members over another's (Li, 2020). However, the finding that belonging to national, EU, and global citizenship loaded on one factor may indicate a superordinate identity in which everyone is an ingroup member (Reysen & Katzarska-Miller, 2017).

Future research can further explore the characteristics of groups, communities, and societies that are the most protective against loneliness. It is also worth exploring trajectories of concepts related to loneliness such as ostracism (Kiuru et al., 2024) with regard to group belonging. Randomized controlled trials can test how interventions could improve loneliness and its concomitants through group belonging (see, e.g., Groups 4 Health, a group psychotherapy intervention; Cruwys et al., 2019), although effects on intergroup factors, for example, ingroup favoritism (Li, 2020), should be monitored. In a school context, it would be beneficial to trial whole-school or whole-class programs and group work, both for improving collective academic achievement and reducing loneliness (Qualter, 2003).

This study is the first to show that belongingness to different groups is a promising avenue for managing loneliness trajectories. Here is evidence that belonging to a group of friends, hobby group, and home are conducive to low loneliness trajectories, while belonging to a religious community was not related to loneliness trajectories in this sample. While chronic loneliness sufferers may achieve high grades in high school, we should watch out for those who suffer this prolonged loneliness across adolescence and high school as they are more likely to also suffer from depression, low life satisfaction, and school burnout.

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Supplemental Material

Supplemental material for this article is available online.

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