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ARTICLE

Fitting in and feeling good: Reciprocal associations between peer acceptance and emotions in the classroom

Tim Mainhard¹  | Elisabeth Graf²  | Minke A. Krijnen¹  |
Lian Van Vemde³  | Bjorn G. J. Wansink⁴  | Thomas Goetz⁵ 

¹Institute of Education and Child Studies, Leiden University, Leiden, The Netherlands

²Department for Educational Sciences and Psychology, Center for Research on Education and School Development (IFS), TU Dortmund University, Dortmund, Germany

³Department of Interdisciplinary Social Science, Utrecht University, Utrecht, The Netherlands

⁴Department of Education, Utrecht University, Utrecht, The Netherlands

⁵Department of Developmental and Educational Psychology, Faculty of Psychology, University of Vienna, Vienna, Austria

Correspondence

Tim Mainhard, Institute of Education and Child Studies, Leiden University, Wassenaarseweg 52, 2333 AK Leiden, The Netherlands.
Email: m.t.mainhard@fsw.leidenuniv.nl

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Abstract

Background: According to the control-value theory of achievement emotions, the classroom social environment is an important antecedent of children's emotions, with emotions, in turn, influencing this environment. We focus on a in CVT largely neglected but important aspect of CVT that has been largely neglected: peer relationships.

Aims: This longitudinal study examined within-child reciprocal relations between peer relationships in the classroom, specifically acceptance by peers, and children's experiences of enjoyment and anxiety.

Sample: A total of 1686 children (grades 4 to 6) from 78 classrooms participated across three waves of data collection during one school year.

Methods: We used a multi-informant approach including sociometric acceptance (i.e. the number of classmates who indicate they like a child) and self-perceived acceptance (i.e. the extent to which a child experiences peer liking). Enjoyment and anxiety in the classroom were assessed via child self-reports. Random Intercept Cross-Lagged Panel Models were used to examine reciprocal associations between acceptance and emotions.

Results and Conclusions: Peer acceptance and children's enjoyment and anxiety were interconnected and relatively stable across the school year. Within-person fluctuations in self-perceived acceptance and enjoyment were related (i.e. cross-lagged effects) during the second half of the year, with small to medium effect sizes. When children experienced

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more enjoyment than usual, they subsequently tended to perceive more acceptance, and vice versa. Unexpectedly, higher anxiety at the start of the year predicted slightly more sociometric acceptance at the next wave. These findings highlight that both emotions and acceptance can serve as valuable starting points for strengthening children's positive classroom experiences.

KEYWORDS

classroom, emotions, peers, social relationships acceptance

INTRODUCTION

Academic and social–emotional development, as well as student well-being, are core goals of educational systems. Two constructs have been shown to play a central role in this respect: being accepted by classmates and the emotions students experience in the classroom (Wentzel et al., 2021). While each exerts an important influence on students, findings largely stem from two separate lines of research (Pekrun, 2024; Rubin et al., 2015). However, in the classroom, children's social experiences and their emotions are closely intertwined (Dougherty, 2006) and may reinforce or undermine each other. The current paper examines these dynamics in terms of peer acceptance and classroom enjoyment and anxiety.

Pekrun's control-value theory (CVT; 2024), which addresses the antecedents and effects of emotions in learning and achievement contexts, posits that students' emotions arise from the classroom environment and also feed back into it. Existing studies on such reciprocal effects have primarily focused on emotional transmission between teachers and students (e.g. Frenzel et al., 2017). Yet relationships with classmates constitute a major part of this environment (Rubin et al., 2015), and research on reciprocal associations between peer relations and classroom-related emotions remains scarce.

Peer acceptance is widely recognized as a key factor in socioemotional and academic adjustment (Allen & Boyle, 2022; Cillessen & Mayeux, 2004) and refers to the extent to which children are liked or included by their classmates. Within CVT, it can be conceptualized as both an antecedent of emotions and an outcome shaped by them, implying reciprocal relations (Pekrun, 2024). Positive emotions such as enjoyment may facilitate the initiation and maintenance of social bonds, whereas negative emotions such as anxiety may hinder peer interactions. Although these associations are well documented cross-sectionally, longitudinal research is needed to clarify their directionality and temporal dynamics (cf. Dougherty, 2006; Maszk et al., 1999). The present study therefore investigates longitudinal, reciprocal associations between peer acceptance and students' classroom emotions over 1 year, thereby testing predictions derived from CVT.

Relations between academic emotions and the school social environment

A core theory focusing on the relationships between academic emotions and the school environment is the control-value theory (CVT; Pekrun, 2024). According to CVT, academic emotions are shaped by contextual antecedents in the classroom. In our research, we focus on enjoyment and anxiety, two emotions that have been extensively investigated and that show clear associations with numerous outcome variables, including academic achievement (e.g. Brunner et al., 2026; Goetz et al., 2007; Pekrun et al., 2023). It is important to note that, from a theoretical perspective, enjoyment and anxiety are clearly distinct emotions. For example, enjoyment is a positive emotional experience, whereas anxiety is a negative one (affective component; Scherer, 2000). Moreover, enjoyment tends to align with mastery

goal orientation, whereas anxiety is associated with performance goals (motivational component; see Goetz et al., 2016; Pekrun et al., 2009). At the same time, they share some commonalities. For instance, both are activating emotions, in contrast to emotions such as hopelessness and boredom, which are deactivating (Goetz et al., 2023). The idea that emotions differ to varying degrees depending on their overlap across emotion components and other dimensions is consistent with contemporary network models of emotional experience (e.g. Lange & Zickfeld, 2021). In sum, enjoyment and anxiety are clearly distinct along several dimensions, yet they also share similar features.

Classroom antecedents of academic emotions include factors such as the quality of instruction or the goal structure a teacher establishes (Sun et al., 2022; Wang et al., 2017). CVT assumes that children's emotions are directly affected by these antecedents, for example, by satisfying basic human needs (Baumeister & Leary, 1995), as well as indirectly through children's control- and value appraisals. These result from children's perception of the classroom environment, such as a sense of efficacy and the intrinsic value of concurrent classroom activities. In addition, reciprocal links between emotions and their antecedents are assumed. That is, children's positive emotions may shape the classroom environment, for example, by affecting how teachers approach them (Pekrun, 2024).

Whereas some contextual factors, like the quality of classroom instruction, have received great attention in CVT research (e.g. Chen & Lu, 2022; Lazarides & Buchholz, 2019; Lazarides & Raufelder, 2021), only very few studies have specifically investigated social relations in the classroom as a contextual antecedent. Considering the social environment as an antecedent of emotions aligns with seminal work stemming from some decades ago, which emphasized that emotions are relational and shape social bonds. Frijda (1986) emphasized that emotions both arise from and serve to shape interpersonal relations. He conceptualized emotions as action tendencies that are triggered by appraisals of events in relation to personal concerns. In social contexts, this refers particularly to concerns about affiliation, status, and relational continuity. From this perspective, social interactions are evaluated in terms of their implications for one's standing with others, and the resulting emotions prepare individuals to act in ways that regulate social interaction — sometimes facilitating the establishment, maintenance, or repair of social bonds, but at other times (e.g. in the case of anxiety) promoting withdrawal or avoidance that may further strain relationships. Importantly, these action tendencies are not internal only but are expressed in behaviour and emotional displays, thereby influencing how others respond and, in turn, shaping subsequent interactions. Parkinson (1996) extended this view by arguing that these processes are inherently embedded in ongoing social exchanges. Emotions are not only shaped by immediate interactions but also by accumulated interpersonal experiences, through which individuals develop generalized expectations about how they are perceived and treated by others. These expectations guide the interpretation of current social events and the expression of emotion within them, such that emotional experiences and displays both reflect and contribute to the unfolding of relationships over time. Consistent with this, Baumeister and Leary (1995) proposed that humans possess a fundamental need to belong, implying that individuals are well attuned to changes in their level of social inclusion and exclusion. Emotional responses can thus be understood as signals of changes in perceived relational value: Successful inclusion and acceptance confirm belongingness and elicit positive affect such as enjoyment, whereas cues of rejection or instability in social bonds signal potential loss of belonging and elicit anxiety (see also Lyubomirsky et al., 2005). These emotions, in turn, are expressed in ways that orient individuals towards or away from others and thereby influence subsequent social interactions. For example, Ladd and Troop-Gordon (2003) proposed that enjoyment may foster social openness, which increases positive relations with peers. In this way, emotions function as part of an interpersonal feedback cycle in which social experiences shape emotions, and emotional expressions and action tendencies, in turn, shape the development of social relationships.

Empirical evidence from classroom research is broadly consistent with this cycle, although studies that capture its full reciprocal nature remain relatively scarce. One example is Goetz et al. (2021), who, across a broad spectrum of academic emotions and school subjects, showed that secondary school students' positive emotional experiences were reciprocally related to teacher closeness over a period of one school year. Initial emotions were somewhat stronger predictors of teacher closeness 1 year later than

vice versa. Specifically, initial teacher closeness was linked to later negative emotions, while both initial positive and negative emotions (mainly enjoyment) predicted later relationship quality.

The current investigation extends existing work by focusing on peer relations rather than teacher–student relationships and by studying reciprocal relations between academic emotions and their social antecedents across three waves of data collected during one school year.

Peer acceptance as a core facet of the classroom social environment

Peer acceptance is a core facet of the classroom social environment. Two complementary approaches exist: First, peer acceptance can be conceptualized as a *child's own perception* of being accepted and of belonging to others (Allen & Boyle, 2022; Goodenow, 1993; Kiefer et al., 2015), for example, as reflected in questions such as ‘Do you get along with other kids at school?’ (Rutland et al., 2012). Such perceptions have been associated with higher school motivation (Kiefer et al., 2015) and engagement (Lan, 2023), whereas low perceived acceptance predicts loneliness and negative self-evaluations (Cassidy & Asher, 1992; Humenny et al., 2021; Ladd et al., 2025). Second, classmates' preference for a child (e.g. ‘Which classmates do you like most?’) reflects a *child's sociometric acceptance* (Cillessen & Bukowski, 2018). Acceptance in these terms is typically associated with more prosocial behaviour and lower levels of aggression (Cillessen & Mayeux, 2004), which can be viewed as consolidating or further deepening social bonds. Cillessen and Bukowski (2018) suggested that acceptance by many classmates also reflects more opportunities for enjoyable, productive interactions and support, but also influences how emotions are expressed and received by classmates—a positive relational context may guide attention more toward positive rather than negative emotional expressions.

From a CVT perspective, peer acceptance can also be assumed to be reciprocally linked with students' emotions tied to their classroom experiences. Research on children's general affect supports such a link with peer acceptance. Being included by peers is considered conditional for experiencing belonging in school (Allen et al., 2018). In this sense, social acceptance by peers can be seen as a high-value antecedent for all children, predicting their emotions. Social acceptance could also buffer against negative feedback or increase anticipated support from peers when problems occur, thereby increasing students' feelings of control in achievement-related situations in the classroom. At the same time, when children experience less peer acceptance, they would also experience less belonging and less control over their social engagement with classmates (Pekrun, 2024). In line with this, a meta-analysis by Dougherty (2006) indicated that positive affect was associated with higher concurrent peer acceptance (small effect), while negative affect was associated with lower peer acceptance (small to moderate effect). Looking at emotions more directly, enjoyment and optimism have been linked to greater acceptance among peers cross-sectionally (Oberle et al., 2010). Likewise, Arsenio et al. (2000) and Shao and Parkinson (2021) found that children with more positive and less angry prevailing emotions were more accepted by peers.

Longitudinal research seems to indicate that initial emotions are somewhat more predictive of later peer acceptance than vice versa. Maszk et al. (1999) found that emotionality predicted later peer acceptance in children aged 4 to 6, whereas initial acceptance did not predict emotionality over time. In a kindergarten sample, Hernández et al. (2017) similarly observed that peer acceptance in the fall did not predict children's affect in the spring. However, initial negative emotions did predict lower peer acceptance later on. More recently, Bengtsson et al. (2022) suggested a bidirectional or transactional link—a ‘vicious circle’—between children's negative emotions and their peer acceptance over 2 years. Across three waves of data collection, using cross-lagged analyses, they found that children with more negative emotions were more likely to have lower peer status later on, and those children, in turn, were more likely to subsequently report more negative emotions than others. This aligns with the idea that (negative) emotions are expressed in ways that orient children towards or away from their classmates and thereby influence subsequent social relations.

Taken together, the evidence indicates that the link between peer acceptance and emotions is probably bidirectional, but the exact dynamics connecting the two are not yet fully understood. We assume

that peer acceptance represents high value for children and may provide a sense of security and enhance control appraisals if present, thereby fostering positive emotions. We conclude, in line with Dougherty (2006), that existing evidence is limited by methodological constraints, including the cross-sectional nature of many existing studies using between-person analyses and relatively small sample sizes.

The current study

Guided by CVT, which posits reciprocal links between social classroom factors and students' emotional experiences (Pekrun, 2024), this study examined longitudinal associations between peer acceptance and children's enjoyment and anxiety. Enjoyment and anxiety are two of the most prevalent and, up to now, most often investigated positive and negative emotions. Both have been shown to be highly important for an array of school outcomes (Goetz et al., 2023). Similarly, peer acceptance is a central aspect of the classroom social fabric (Rubin et al., 2015) with many implications for children's school adjustment. Specifically, we hypothesized positive, longitudinal associations between acceptance (in terms of both self-perceived and sociometric acceptance) and subsequent classroom-related enjoyment, and negative associations with classroom-related anxiety. Similarly, we expected positive relations over time between enjoyment and subsequent acceptance and negative relations between anxiety and acceptance (see Figure 1). Given that subjective experiences constitute the most proximal antecedents of academic emotions (Pekrun & Goetz, 2023), we expected stronger associations between self-perceived acceptance and emotions than between sociometric acceptance and emotions. Specifically, self-perceived acceptance directly reflects children's appraisals of belonging and social value in the classroom, which are central to the control and value appraisals underlying academic emotions in CVT (Pekrun, 2024). In contrast, sociometric acceptance captures how peers evaluate the child, but only indirectly informs these subjective appraisals, and may therefore represent a more distal antecedent of emotional experience.

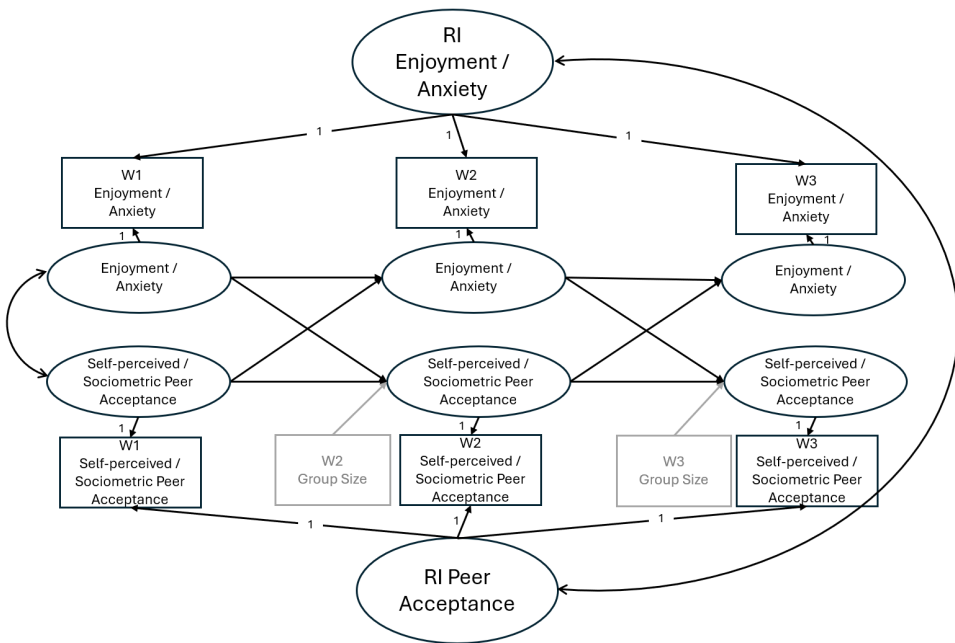


FIGURE 1 Conceptual model of the random intercept cross-lagged panel model for the associations between emotions (enjoyment and anxiety) and peer relations. Error correlations at W2 and W3 are not displayed. 'Group Size', displayed in grey, was included in models using sociometric acceptance.

Taken together, the present study therefore addresses the following research question: How are peer acceptance and children's academic emotions, specifically classroom enjoyment and anxiety, interrelated over time? Based on existing theory and empirical work, we formulated the following hypotheses.

Hypotheses

Regarding the stable, trait-like association between acceptance and emotions, our hypothesis was:

H1. At the between-person level, enjoyment is positively and anxiety is negatively associated with peer acceptance.

Regarding the reciprocity between acceptance and emotions, our hypotheses were:

H2. Within-person temporary increases in acceptance predict higher subsequent enjoyment, and higher enjoyment predicts higher subsequent acceptance, indicating a positive reciprocal link over time.

H3. Within-person temporary increases in acceptance predict lower subsequent anxiety, and higher anxiety predicts lower subsequent acceptance, indicating a negative reciprocal link over time.

Although the hypotheses specify directional reciprocal associations, previous research has been predominantly cross-sectional, leaving open the possibility of alternative patterns, such as unidirectional or asymmetrical relations between peer acceptance and emotions.

We extended existing studies by using a relatively large sample, by testing longitudinal links over three waves of data collection, and by specifically focusing on within-person links of acceptance and emotions through Random Intercept Cross-Lagged Panel Modelling (RI-CLPM; Hamaker et al., 2015). Our focus was on elementary classrooms, as during this school phase the composition of classes is relatively stable, that is students are not grouped with different classmates depending on the school subject.

METHOD

Participants and procedure

Data were collected among 1686 children from 78 elementary classrooms and 33 schools (25.6% Grade 4, 28.2% Grade 5, 29.5% Grade 6, 16.7% combination classes; 49.1% boys; $M_{age} = 10.14$ years, $SD = .96$) in the Netherlands. Of the children, 50.1% had a Dutch family background, 37.1% of the children indicated that at least one of their parents was not Dutch, and for 11.5% the background was unknown. Data was collected during one school year (fall 2021 T1, winter 2022 T2, and spring 2022 T3). Between the first and second wave, there were, on average, 120 days ($SD = 14.75$; ranging from 96 to 203 days). Between the second and third waves, there were, on average, 83 days ($SD = 10.62$; ranging from 57 to 105 days). The timing of the measurement waves was guided by both theoretical and practical considerations. First, the initial interval allowed classroom social processes and relationships to emerge and stabilize to some extent at the beginning of the school year, rather than capturing only very early, potentially transient interactions. Second, subsequent waves were spaced approximately evenly across the school year to capture developmental changes over time while maintaining comparability between intervals. This spacing aligns with prior work indicating that developmental and social processes unfold on multiple timescales, with meaningful changes in peer relations and classroom dynamics typically occurring over weeks to months (Rubin et al., 2015). Finally, the specific timing also took into account the structure of the school year (e.g. holidays), ensuring feasibility and minimizing disruption to classroom routines.

Children had informed parental consent and completed the questionnaire on tablets during school hours. This study was approved by the Faculty Ethics Review Board [nr. 20-362].

Measures

Academic emotions

We assessed enjoyment and anxiety related to children's general classroom experience. The two emotions were each assessed with 4-item self-report scales (see [Supporting Information 1, Table S1.1](#)) adapted from the Academic Emotions Questionnaire (see [Table S1](#); Pekrun et al., 2002), including similar item stems ('During most lessons I ...') and rated on a 5-point Likert scale (1 = not true at all; 5 = completely true). Enjoyment (e.g. 'During most lessons I am enthusiastic') showed good internal consistency ($\alpha_{T1} = .825$; $\alpha_{T2} = .865$; $\alpha_{T3} = .880$) and internal validity ($\lambda_{\text{Range } T1} = .71-.87$, $\lambda_{\text{Range } T2} = .77-.87$, $\lambda_{\text{Range } T3} = .78-.90$) as did anxiety (e.g. 'During most lessons I am worried'; $\alpha_{T1} = .719$; $\alpha_{T2} = .751$; $\alpha_{T3} = .796$; $\lambda_{\text{Range } T1} = .72-.76$, $\lambda_{\text{Range } T2} = .67-.80$, $\lambda_{\text{Range } T3} = .71-.83$).

Peer acceptance

Sociometric acceptance

Sociometric acceptance was measured by a single peer-nomination item (i.e. 'Who of your classmates do you like most?') with an unlimited number of possible nominations (Babcock et al., 2014). The peer-report score was calculated as (the number of incoming nominations)/(number of consented children in the classroom-1), resulting in a proportion score ranging from 0 (= no nominations received) to 1 (= all classmates indicated they liked this child; Cillessen & Bukowski, 2018). Using proportion scores standardizes nominations for classroom size, allowing sociometric acceptance to be compared across classrooms with different numbers of participating children.

Self-perceived acceptance

Self-perceived peer acceptance was assessed with four items adapted from the Loneliness and School Dissatisfaction Questionnaire (LSDQ; Cassidy & Asher, 1992). The items capture children's perceptions of being liked and socially included by their classmates and therefore reflect the construct of self-perceived peer acceptance, defined here as children's subjective perception of how well they are accepted within the peer group. The scale follows the adaptation procedure reported by Rutland et al. (2012), who derived a shorter measure of peer acceptance by selecting the 10 items with the highest loadings on a single factor from the LSDQ items. Subsequently, Geerlings et al. (2017) selected four items from this shortened version and rephrased them for the context of Dutch elementary school classrooms.

These items focus on children's perceptions of getting along with classmates and being socially accepted within the class group (e.g. 'With how many classmates can you do fun things?', see [Supporting Information 1, Table S1.2](#)), answered on a 5-point Likert scale (1 = Almost no one; 5 = Almost everyone). Previous work using this adaptation reported satisfactory internal consistency and evidence of convergent validity, including negative associations with peer victimization (Geerlings et al., 2017; Thijs & Fleischmann, 2015). In the present study, internal validity and reliability were good across all waves ($\alpha_{T1} = .844$; $\alpha_{T2} = .868$; $\alpha_{T3} = .893$; $\lambda_{\text{Range } T1} = .79-.87$, $\lambda_{\text{Range } T2} = .81-.88$, $\lambda_{\text{Range } T3} = .83-.91$).

Data analysis

We tested longitudinal measurement invariance for enjoyment, anxiety, and peer acceptance in a preliminary analysis (see [Supporting Information 2](#)) and compared changes in fit-indices to guidelines

proposed by Chen ($\Delta\text{CFI} \geq -.010$; $\Delta\text{RMSEA} \geq .015$, $\Delta\text{SRMR} \geq .03$; 2007). We used Random Intercept Cross-Lagged Panel Modelling (RI-CLPM) to test our hypotheses. RI-CLPM separates time-invariant stability in associations between emotions and acceptance (H1) from within-person dynamics over time (Hamaker et al., 2015; H2 and H3). Running separate models for each combination of emotion and peer acceptance measure (i.e. four separate models), we estimated how enjoyment and anxiety were interrelated with peer acceptance (sociometric and self-perceived acceptance) within persons over time by including lagged and cross-lagged effects (testing H2 and H3, respectively). Group size (i.e. number of students present during the data collection) was added as a control variable in models using sociometric acceptance, as it affects the peer status proportion scores. Models were estimated in R with the Lavaan package (Rosseel, 2012) following Mulder and Hamaker (2021) using Full Maximum Likelihood Estimation (FIML) and classroom as a cluster variable to adjust standard errors for the clustered structure of the data.

RESULTS

In Table 1, descriptives of the main variables and their correlations are outlined. Sociometric acceptance was positively associated with self-perceived acceptance ($r = .27$ to $.32$), suggesting partial correspondence between the reputation of children and their own experience of acceptance. Furthermore, emotions and acceptance indicators were quite stable across time (auto-correlations between $r = .53$ and $r = .75$). Enjoyment and anxiety were only weakly to moderately negatively associated ($r = -.22$ to $r = -.25$). Furthermore, sociometric acceptance and self-perceived acceptance were positively associated with enjoyment ($r = .14$ to $r = .47$) and negatively with anxiety ($r = -.07$ to $r = -.23$; but see a small and non-significant association between anxiety and sociometric acceptance at T1). Intraclass correlations indicated that 60% of the variance in enjoyment and 56% of the variance in anxiety resided at the between-student level, with the remaining 40% and 44% of within-student variance corresponding to the residual proportion, respectively.

Preliminary analyses

Missing data

Overall, 7.3% of the data used for the RI-CLPM were missing. Specifically, 23.8% of participants had some missing data. Students with missing data did not differ regarding gender ($\chi^2 = 0.09$, $p = .758$) and ethnic background ($\chi^2 = 1.91$, $p = .167$), but were slightly older compared to students without missing data ($M = 10.38$ compared to $M = 10.07$; $t = -5.64$, $df = 653.58$, $p < .001$). Thus, the stricter assumption that data were missing completely at random was not fully supported. Although the missing-at-random assumption cannot be tested directly, the relatively small amount of missing information and main focus on within-person associations suggest that FIML provides a reasonable approach for handling missingness.

Longitudinal measurement invariance

According to guidelines suggested by Chen (2007), the results from our models on longitudinal measurement invariance supported scalar invariance for enjoyment and strict invariance for anxiety and peer acceptance (see Supporting Information 2, Table S2.1). Thus, for all measures, loadings and intercepts are comparable across time, supporting our use of the measures for longitudinal modelling (Little, 2013). Given that strict invariance, meaning an additional equality of residual variance across time, is often overly restrictive and implausible (Little, 2013), the lack of support indicated

TABLE 1 Descriptive statistics of and bivariate Pearson correlations between study variables.

	<i>N</i>	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Enjoyment T1	1542	3.96	0.86											
2. Enjoyment T2	1504	3.98	0.88	.57**										
3. Enjoyment T3	1479	3.89	0.94	.54**	.70**									
4. Anxiety T1	1542	2.06	0.85	-.22**	-.18**	-.18**								
5. Anxiety T2	1504	1.97	0.86	-.23**	-.25**	-.24**	.53**							
6. Anxiety T3	1479	1.95	0.90	-.20**	-.22**	-.25**	.49**	.65**						
7. Sociometric acceptance T1	1639	0.45	0.17	.13**	.12**	.11**	-.05	-.07*	-.08**					
8. Sociometric acceptance T2	1602	0.43	0.17	.11**	.15**	.12**	-.01	-.07**	-.08**	.71**				
9. Sociometric acceptance T3	1560	0.43	0.17	.13**	.15**	.15**	-.06*	-.07**	-.08**	.64**	.75**			
10. Perceived acceptance T1	1542	3.44	0.87	.37**	.35**	.28**	-.21**	-.21**	-.16**	.27**	.25**	.26**		
11. Perceived acceptance T2	1504	3.45	0.89	.30**	.47**	.40**	-.20**	-.29**	-.22**	.25**	.30**	.30**	.64**	
12. Perceived acceptance T3	1479	3.51	0.83	.31**	.47**	.47**	-.20**	-.22**	-.23**	.24**	.28**	.32**	.59**	.70**

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

by the change in CFI in the model on enjoyment ($\Delta\text{CFI} = -.018$) does not affect our methodological approach.

Random intercept cross-lagged panel models

Hypothesis 1

Regarding the *between-person effects*, children differed clearly in their overall acceptance and the enjoyment and anxiety they experienced. All models indicated statistically significant correlations between these trait-like aspects of children's emotions and acceptance (i.e. the latent means). Specifically, and confirming H1, students reporting generally higher enjoyment than their classmates were also overall more accepted by their peers (sociometric acceptance; $r = .23$) and reported a generally higher self-perceived acceptance ($r = .51$; see Figure 2). Students reporting higher overall levels of anxiety than others were less accepted by their peers ($r = -.16$) and felt less accepted themselves ($r = -.31$; see Figure 3). This also confirmed our expectation that effects would be stronger for students' self-perceived acceptance.

Hypotheses 2 and 3

Regarding the *within-person effects*, we found positive autoregressions (i.e. inertia or carryover) in the second half of the school year. Only for sociometric acceptance, we found statistically significant positive autoregressions between both intervals (T1 to T2: $\beta = .25$, $p = .003$; T2 to T3: $\beta = .32$, $p < .001$). This indicates that when a child was more accepted than usual at one moment, this was likely to induce a mild upward ripple in acceptance at the subsequent time point. Similarly, we found positive autoregressions between T2 and T3 for self-perceived acceptance ($\beta = .24$, $p < .001$) and both emotions (enjoyment: $\beta = .37$ and $\beta = .29$, $p < .001$; anxiety: $\beta = .34$ and $\beta = .32$, $p < .001$ for the model on sociometric acceptance

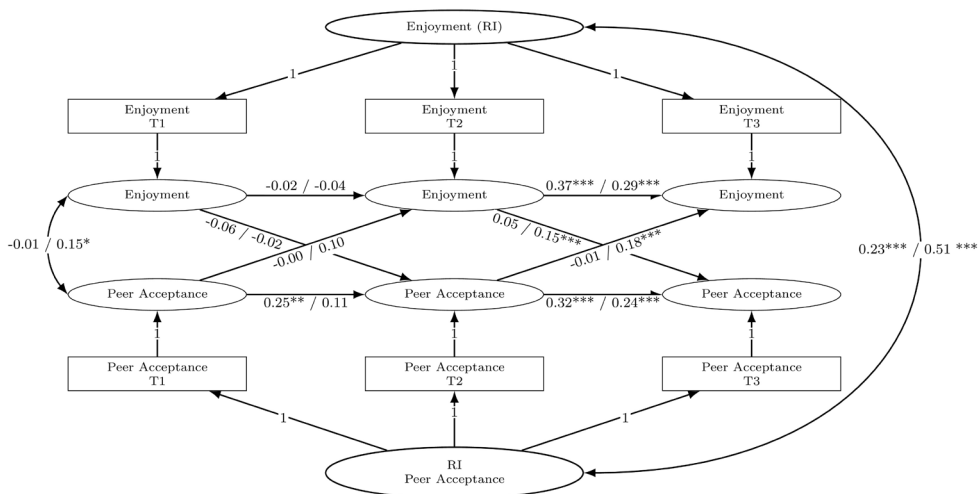


FIGURE 2 Random intercept cross-lagged panel model for students' enjoyment and peer acceptance. Standardized betas from two separate models are presented: The first value before the slash is based on the model with sociometric acceptance ($N = 1686$), and the second value after the slash is from the model with self-perceived acceptance ($N = 1677$). The model fit was excellent for both models (sociometric acceptance: $\chi^2_{(11)} = 47.75$, $\text{CFI} = 0.998$, $\text{TLI} = 0.996$, $\text{RMSEA} = 0.013$, $\text{SRMR} = 0.040$; self-perceived acceptance: $\chi^2_{(11)} = 0.11$, $\text{CFI} = 1.000$, $\text{TLI} = 0.995$, $\text{RMSEA} = 0.025$, $\text{SRMR} = 0.007$). In the models on sociometric acceptance, the number of peers present during data collection was included as a control variable. More details on the estimates (SE, exact p -value) are reported in Table S3.1 of Supporting Information 3. * $p < .05$. ** $p < .01$. *** $p < .001$.

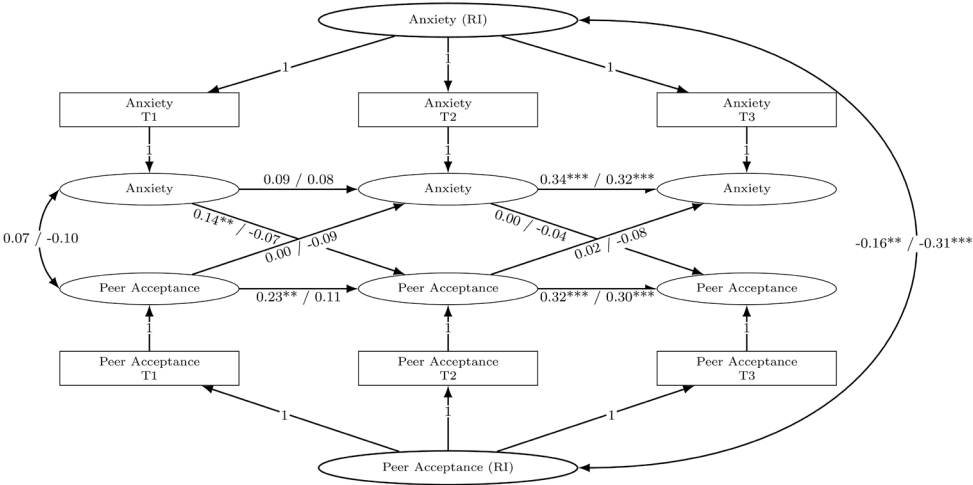


FIGURE 3 Random intercept cross-lagged panel model for students' enjoyment and peer acceptance. Standardized betas from two separate models are presented: The first value before the slash is based on the model with sociometric acceptance ($N=1686$), and the second value after the slash is from the model with self-perceived acceptance ($N=1677$). The model fit was excellent for both models (sociometric acceptance: $\chi^2_{(11)}=45.52$, CFI=0.998, TLI=0.995, RMSEA=0.013, SRMR=0.043; self-perceived acceptance: $\chi^2_{(1)}=0.15$, CFI=1.000, TLI=0.997, RMSEA=0.017, SRMR=0.006). In the models on sociometric acceptance, the number of peers present during data collection was included as a control variable. More details on the estimates (SE, exact p -value) are reported in Table S3.2 of Supporting Information 3. * $p<.05$. ** $p<.01$. *** $p<.001$.

and self-perceived acceptance, respectively; see Figures 2 and 3), indicating a carryover of acceptance and emotions during the second half of the school year.

Further, and relevant to H2 and H3, which state that emotions and acceptance have reciprocal links over time, cross-lagged effects indicated a positive, reciprocal, but not strongly deterministic within-person link between enjoyment and self-perceived acceptance from T2 to T3 (H2).

Specifically, and partially confirming H2, experiencing higher enjoyment than one's average at T2 was related to higher self-perceived acceptance at T3 ($\beta=.15, p<.001$), and higher self-perceived acceptance at T2 was related to higher subsequent enjoyment at T3 ($\beta=.18, p<.001$). Similarly, these associations indicate that lower enjoyment or perceived acceptance at T2 predicted subsequent declines in the other variable. Not confirming H2, for sociometric acceptance, no cross-lagged effects were present in the enjoyment model ($\beta=-.06$ to $.05, p>.216$). Overall, the results for reciprocal effects, including enjoyment, were in line with our expectation that self-perceived acceptance would yield stronger effects.

Opposing H3, our analyses predicted a positive rather than a negative link between anxiety at T1 and sociometric acceptance at T2. If a child experienced somewhat more anxiety than their average at T1, this child was predicted to be somewhat more accepted by peers at T2 ($\beta=.14, p=.003$), or vice versa, if a child experienced less anxiety than usual at T1, this child would be somewhat less liked at T2. None of the other cross-lagged effects for anxiety were statistically significant ($\beta=-.09$ to $.02, p>.172$).

Robustness checks

We ran our models, including schools as a clustering variable instead of using robust standard errors to control for dependency in the data. The results largely mirrored those reported in the main body of the paper, with estimates at times being slightly stronger. Details are reported in Tables S4.1 and S4.2 in the Supporting Information. In addition, we also analysed enjoyment and anxiety in a joint model. The results were highly comparable to those reported in the separate models, with the same pattern of

significance for the tested hypotheses. This suggests that the main findings are robust and not driven by model specification. Details can be found in [Supporting Information 5](#), [Figures S5.1](#) and [S5.2](#).

In sum, in line with [H1](#), we found positive between-person associations between enjoyment and peer acceptance and negative between-person associations between anxiety and peer acceptance, independent of the type of measurement used (sociometric versus self-reported). Within persons, we found partial support for [H2](#), indicated by reciprocal associations between enjoyment and self-reported peer acceptance. In contrast to [H3](#) and against our expectation, we found a positive association between anxiety at T1 and sociometric peer acceptance at T2, indicating that higher reported anxiety than usual at T1 predicted higher acceptance by peers at T2.

DISCUSSION

Being accepted by classmates and the emotions students experience in the classroom are both key factors in students' well-being and their academic and social–emotional school adjustment (Rubin et al., 2015; Wentzel et al., 2021). Based on Control-Value Theory (CVT; Pekrun, 2024), we expected reciprocal associations between both constructs.

Our main findings were, first, and confirming [H1](#), that peer acceptance and children's enjoyment and anxiety were clearly interconnected with their acceptance and relatively stable over the course of a school year. Second and partially confirming [H2](#), fluctuations in self-perceived acceptance and emotional experiences were linked to each other (i.e. we found cross-lagged effects), particularly in the second half of the school year (small to medium-sized effects; Orth et al., 2024). When students experienced more enjoyment than usual, they subsequently tended to perceive themselves as more accepted and vice versa. Conversely, lower-than-usual acceptance was followed by reduced enjoyment, and lower enjoyment predicted decreases in perceived acceptance. Finally, although sociometric acceptance and anxiety were connected within children over time ([H3](#)), we found that at the beginning of the school year, higher-than-average anxiety was associated with later increased rather than decreased sociometric acceptance. Together, these findings do partially support the central proposition of CVT that academic emotions feed back into their antecedents (Pekrun, 2024). Enjoyment in the classroom can shape students' perceptions of their social classroom environment, supporting the idea that emotions are not merely outcomes but also shape the social classroom environment.

Coupling of peer acceptance and emotion

Children who were generally more accepted by their peers, both in terms of what their peers think (sociometric acceptance) or what they themselves experience, overall also enjoyed class more and tended to experience less anxiety (i.e. stable between person–person differences; [H1](#)).

Enjoyment—[H2](#)

Over time and within children, fluctuations in enjoyment were dynamically coupled with their self-perceived peer acceptance, with fluctuations in either one reinforcing the other. The cross-lagged effects ($\beta = .15$) can be considered modest but meaningful. In RI-CLPMs, such effects reflect within-person changes over time while controlling for stable between-person differences and are typically smaller and more conservative than estimates from traditional cross-lagged models (Hamaker et al., 2015). Notably, the cross-lagged effect was approximately half the size of the autoregressive paths ($\beta = .25–.35$), indicating a non-trivial influence which potentially accumulates over time, relative to the stability of the constructs over time. Our results indicate that fluctuations in enjoyment and acceptance can reinforce each other over time, over and above students' trait-like long-term tendencies to feel more or less accepted and

to enjoy class more or less. This may partly explain why some children develop positively and become better adjusted, while others' adjustment becomes more strained.

When a child experienced more enjoyment (or acceptance) than usual halfway through the school year, this predicted a subsequent small to moderate upward ripple in the other variable toward the end of the school year. The modest effect sizes mean these spirals are likely to be gradual. H2 was therefore only partly supported, as we found no reciprocal effects between T1 and T2. In line with Ladd and Troop-Gordon (2003), a temporary increase in enjoyment may foster social openness, which increases positive peer experiences. Conversely, decreases in enjoyment may interfere with social participation, reducing perceived acceptance and potentially leading to further emotional disengagement, as Bengtsson et al. (2022) suggested.

The finding that only *self-perceived acceptance* was dynamically coupled with enjoyment suggests that children's internal interpretation of their social standing is relevant for changing emotional experiences, even when it diverges from their objective peer status. This is in line with the CVT assumption that subjective realities are proximal antecedents of emotions and therefore more important for academic emotions than external indicators or observations of the learning environment (i.e. distal antecedents; Pekrun & Goetz, 2023). Self-perceived acceptance captures the internal perception of being liked—even if it is inaccurate, it is a child's lived social reality. Still, shared method variance (e.g. same-rater bias) should also be considered (Podsakoff et al., 2003).

An important note is that in the participating classrooms, new teachers are assigned each year, as is customary in elementary schools in the Netherlands. A new teacher may affect a classroom's social-emotional dynamics. The finding that the dynamic link between self-perceived acceptance and enjoyment was particularly present later in the school year suggests that social-emotional systems, including enjoyment in classrooms with a new teacher, take time to stabilize. Although children in upper primary classrooms in the Netherlands enter the school year in existing groups with pre-existing peer relationships, our findings suggest that the link between self-perceived peer acceptance and classroom enjoyment may require time to emerge. One plausible explanation is that the introduction of a new teacher acts as a systemic perturbation, altering the classroom's social-emotional climate and peer relations (Endedijk et al., 2022). When a new teacher enters the classroom, children may need to adapt to new relational expectations, interaction patterns, and instructional styles. From a transactional developmental and ecological perspective (Sameroff, 2009), children, teachers, and the broader classroom context may undergo a process of mutual adaptation before the reciprocal reinforcement between perceived acceptance and enjoyment is re-established.

Anxiety – H3

Although we found a within-person link between acceptance by peers and children's anxiety, which confirms predictions by CVT (Pekrun, 2024), this link was in the opposite direction, as can be expected based on theory and empirical work. Unexpectedly, when a child experienced somewhat more anxiety than usual at the beginning of the school year, this child tended to be more accepted later on. One possible interpretation is that this reflects a situation characterized by high value (i.e. being accepted; Baumeister & Leary, 1995) combined with uncertainty about control (e.g. 'Can I successfully connect with others?'). Within the control-value theory framework (Pekrun, 2024), such combinations of high value and uncertain control are likely to elicit anxiety. Importantly, anxiety is conceptualized as a negative activating emotion focusing on prospective outcomes (Pekrun, 2024), which may heighten children's attention to social cues and evaluation. In the classroom, this heightened sensitivity may lead children to monitor and regulate their behaviour more closely in socially appropriate or affiliative ways, which could, in turn, foster acceptance. Again, these dynamics may be particularly salient early in the school year, when a new teacher enters the classroom. As noted above, such transitions may carry reputational implications among peers and increase children's sensitivity to how their behaviour and social standing are perceived by others. Discussion.

All this requires further investigation, also because our emotion assessment focused on class in general and not on relations with classmates specifically. Thus, results might differ if differentiating between emotions focused on achievement or the social context. Nonetheless, and in line with Rubin et al. (2015), we think it is safe to assume that peer relations are a constituent part of children's classroom experiences.

Unlike enjoyment, anxiety did not show consistent within-person reciprocal effects even though the within-child variances were quite similar, 40% and 44% for enjoyment and anxiety, respectively. Classroom anxiety may be generally more strongly shaped by academic evaluation contexts and self-efficacy rather than by day-to-day peer interactions. In contrast to enjoyment, which is usually seen as an activity-related emotion, anxiety in school is often conceptualized as a prospective outcome emotion (Pekrun, 2024), which may be more strongly tied to achievement outcomes than the social setting. Alternatively, effects may vary across students, such that peer processes influence anxiety primarily among those who are more sensitive to social judgement or exclusion. For example, Gazelle and Druhen (2009) found that children with histories of anxious solitude and peer exclusion reported elevated social anxiety and struggled to repair peer relationships. This fits Ryan and Shim's conceptualization of social achievement goals (2008) and suggests that examining individual difference moderators (e.g. rejection sensitivity, social motivation) could be a fruitful direction for future research.

Strengths, limitations, and future directions

A strength of the present study lies in the use of the RI-CLPM, which separates stable between-person differences from dynamic within-person fluctuations (Hamaker et al., 2015). Nevertheless, causal inference remains limited because time-varying confounding cannot be ruled out (Hamaker, 2025). For example, the unexpected association between anxiety and sociometric acceptance may partly reflect statistical features of the longitudinal model rather than a substantive psychological mechanism, and replication in independent samples is needed to establish the robustness of our findings. Furthermore, while the measurement intervals captured development across the school year, our design was not sensitive to possible faster emotional and acceptance fluctuations, which may unfold across days or even lessons. In addition, methodological advances highlight the potential importance of contemporaneous effects—associations occurring within the same measurement occasion which future research could consider more closely (Muthén & Asparouhov, 2024). Future work could therefore incorporate shorter measurement intervals, such as weekly diaries or experience sampling methods (Goetz et al., 2024), to capture finer-grained emotional and social dynamics. In contrast, extending the timeframe across multiple school years may also clarify how social–emotional coupling develops as students navigate new peer groups and teacher relationships (compare Bengtsson et al., 2022).

Further, although single-item sociometric nominations are widely used and have demonstrated validity in capturing core aspects of peer acceptance, they may be limited in terms of reliability and the breadth of the construct assessed. In particular, relying on a single indicator may not fully capture the multidimensional nature of peer relations or reduce measurement error as effectively as multi-item approaches (e.g. peer relations and group processes in children's social development). At the same time, because they aggregate evaluations from multiple peers, they may provide a more robust and less biased estimate of a child's social standing than single-informant self-reports, albeit still capturing a relatively narrow slice of peer relations (e.g. Rubin et al., 2015).

An additional consideration concerns individual variation in nomination activity (outdegree). Accounting for outdegree represents a complementary analytical perspective, distinguishing between children's social activity (sending nominations) and their received status within the peer group (e.g. Cillessen & Marks, 2011). Whereas the present study focused on being accepted, future research could extend this approach by jointly modelling activity (accepting others) and received nominations (being accepted) to better understand their distinct and combined associations with socioemotional functioning.

Regarding our measures on emotions, we focused on the whole classroom experience ('During most lessons I feel ...'). Thus, it combines both achievement- and activity-related emotions as well as social emotions experienced usually in class. Future studies could verify whether peer relations are relevant only for social emotions experienced in class or also achievement-related emotions by explicitly distinguishing the object focus of the emotions in the assessments (Pekrun, 2024).

In our data, the spacing between T1 and T2 was about 40 days longer than between T2 and T3. This may have affected the link between acceptance by peers and emotions as reflected in our model estimations. The difference in spacing may be an alternative explanation for the non-significant cross-lagged effects between T1 and T2.

Further, we cannot completely rule out that missing data patterns affected our results, given that we found associations between age and missing data (small effect), particularly when considering between-person level results.

Finally, although secondary school students move more often between classrooms and are taught in various groups, investigating reciprocal effects between peer acceptance and student emotions would be very relevant with older students as well.

Practical implications

The findings suggest that fostering positive emotional experiences and supporting the perception of peer relationships go hand in hand to some degree. Consequently, promoting both aspects could support positive upward spirals in students over time.

As for fostering positive emotional experiences, teaching emotion regulation strategies to students might be very helpful, because it allows them to individually enhance their positive and reduce their negative emotional experiences and therefore their emotional displays and social cues. Numerous models and approaches describe the emotion regulation of students (e.g. Harley et al., 2019), and building on this, there are various strategies to train emotion regulation in the classroom (Frenzel et al., 2024). For instance, teachers can demonstrate emotion regulation by labelling, identifying and reframing their own emotions as a model for students. Social and Emotional Learning (SEL) programs also help students develop and practice these skills (for a meta-analysis, see Cipriano et al., 2023).

Concerning peer relationships, which were at the centre of our study, teachers may strengthen their classroom environments by structuring opportunities for positive peer interaction (Farmer et al., 2011), making norms of inclusion explicit (Juvonen et al., 2019), and promoting emotional safety through validation and co-regulation (Spilt et al., 2021). There is a wealth of pedagogical knowledge that teachers can use to establish such inclusive environments, ranging from employing cooperative learning (e.g. Johnson & Johnson, 1994) to literature about cultural responsive teaching (Ladson-Billings, 2021). Moreover, because whether students themselves think they are accepted appears particularly crucial, teachers may need to draw attention to positive social signals and help students interpret them as genuine indicators of belonging. This aspect of teaching could also become a more explicit part of teacher training. Based on our results, we suggested that teachers who take on a to them new classroom group affect students' internal acceptance-emotion dynamics. Investing opportunities for positive peer interaction and children's belonging right away are in line with this.

CONCLUSION

This study demonstrated that children's acceptance in their peer group and their enjoyment and anxiety are connected. Within a child, perceptions of being accepted and their emotional experiences in class are, to a certain degree, dynamic, reciprocal processes that unfold over time. Fluctuations in perceived acceptance or enjoyment may accumulate into broader patterns that shape children's school adjustment.

Taking these dynamics into account may help create classroom environments where students feel both socially valued and emotionally engaged, which will ultimately bolster their well-being as well.

Taken together, our results provide some evidence for an important tenet of Control-Value Theory, namely that emotions can feed back into and shape their antecedents (Pekrun, 2024). Emotions such as enjoyment can initiate upward (and downward) spirals in perceived peer acceptance, thereby influencing the very social conditions that originally shaped those emotions. This reciprocal process highlights the importance of considering emotions as embedded within ongoing social relations.

AUTHOR CONTRIBUTIONS

Thomas Goetz: Conceptualization; writing – review and editing; writing – original draft. **Lian Van Vemde:** Writing – review and editing; data curation. **Bjorn G. J. Wansink:** Conceptualization; funding acquisition; writing – review and editing; supervision. **Elisabeth Graf:** Conceptualization; formal analysis; writing – review and editing; writing – original draft. **Tim Mainhard:** Conceptualization; funding acquisition; writing – original draft; methodology; writing – review and editing; supervision. **Minke A. Krijnen:** Conceptualization; writing – original draft; writing – review and editing; methodology; data curation.

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CONFLICT OF INTEREST STATEMENT

None of the authors have a conflict of interest to disclose.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available upon request from the first author or via Dataverse at <https://doi.org/10.34894/6XF2QZ>.

ORCID

Tim Mainhard  <https://orcid.org/0000-0003-2151-1398>
 Elisabeth Graf  <https://orcid.org/0000-0002-9856-6189>
 Minke A. Krijnen  <https://orcid.org/0000-0002-0160-1831>
 Lian Van Vemde  <https://orcid.org/0000-0003-1214-6421>
 Bjorn G. J. Wansink  <https://orcid.org/0000-0002-5486-5793>
 Thomas Goetz  <https://orcid.org/0000-0002-8908-2166>

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SUPPORTING INFORMATION

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