



Mapping longitudinal trajectories of personal values in elementary school: unveiling roles of the classroom

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ABSTRACT

Value transmission is a key societal responsibility, and value education has gained increasing global attention. Although classrooms represent important developmental environments for children's values, comparatively little is known about how different social actors within classrooms contribute to value development. This longitudinal study examined how classmates, teachers, and classroom relationships contribute to children's value development over time. A total of 1342 Swiss children (ages 5.8–7.3 years, $M_{\text{age}} = 6.82$, $SD = 0.50$) were followed for 1.5 years from the onset of elementary school. We analyzed trajectories of four higher-order value types. Our results showed that self-transcendence (close to compassionate values) and openness-to-change values increased in priority over time, as did conservation values, although the latter increase leveled off at later time points. In contrast, self-enhancement values' priority decreased. Children's values became more similar to those of their peers over time. Children's perceptions of classroom dynamics also predicted value change: Perceiving the teacher as warm predicted later increases in self-transcendence and decreases in self-enhancement value priority; feeling close to the teacher predicted increases in conservation and decreases in openness to change value priority; and feeling close to classmates predicted increases in self-transcendence and decreases in openness to change value priority. Teachers' value-related educational goals did not predict changes in pupils' values. Overall, the findings highlight the importance of a multilayered social perspective for understanding value development and suggest that peers and teacher–pupil relationships play distinct roles in children's moral and social growth.

Value education is widely recognized as a fundamental societal responsibility essential for fostering identity and democracy (Council of Europe, 2016; European Commission, 2018; UNESCO, 2020). It may shape perceptions, attitudes, and behaviors by addressing character formation and moral development (Sagiv & Schwartz, 2021). In elementary school, value education targets developmentally appropriate values, such as empathy, kindness, cooperation, respect, honesty, and responsibility (LaForett et al., 2023). For example, the Swiss curriculum emphasizes benevolence, self-direction, mutual respect, and social responsibility (Oeschger et al., 2022). At this age, children's values are closely tied to observable behaviors and immediate social contexts

(e.g., sharing, following rules), rather than abstract principles (Döring et al., 2016). Consequently, children may acquire values through everyday interactions and structured classroom experiences, such as classroom discussions or collaborative activities, which provide concrete opportunities to internalize social values.

Children's value development unfolds within multiple social contexts, particularly the family and the school (Benish-Weisman et al., 2022; Knafo & Schwartz, 2009). The family is widely regarded as the primary context for early socialization, shaping children's initial value orientations through parenting practices and daily interactions (Grusec, 2011). However, once children enter elementary school, classroom

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environments increasingly contribute to social and moral development by exposing children to shared norms, expectations, and peer interactions beyond the home (Adams & Christenson, 2000; Eccles & Roeser, 2003). Schools thus reinforce societal values and provide additional opportunities for value formation outside the family context (Benish-Weisman et al., 2022). However, most research on children's value development has emphasized family influences (e.g., Grusec & Davidov, 2010; Knafo-Noam et al., 2020), with comparatively less attention to classroom processes—particularly how both teachers and peers contribute to children's developing value systems. Research on classroom environments has consistently demonstrated the importance of teacher-student relationships and peer dynamics for children's socio-emotional and academic adjustment (Ansari et al., 2020; Hamre & Pianta, 2010). Addressing this gap, the present longitudinal study examines how teachers' value-related educational goals, classroom dynamics, and classmates' values are associated with children's value development in Swiss elementary classrooms over 1.5 years. By focusing on classroom-level effects on children's value trajectories, this study extends previous research that has primarily emphasized family socialization processes.

1. What are values?

According to Schwartz's (1992) *model of human values*, empirically confirmed in over 500 samples across 100 countries, covering participants across the lifespan (Sagiv & Schwartz, 2021), *values* are broad motivational goals that guide behavior and life priorities (e.g., benevolence). Research links values to various factors, including gender (Schwartz & Rubel, 2005), socialization experiences (Leaper & Friedman, 2007), and parenting practices (Knafo & Schwartz, 2012). Although the overall structure of values is universal, sample-level variations are common and expected (Witte et al., 2020).

In Schwartz's framework, values are organized into four higher-order dimensions: Self-transcendence values express concern for others and the environment, contrasting with self-enhancement values, which prioritize self-promotion and social recognition. Conservation values emphasize stability and order, contrasting with openness to change values, which favor independence and novelty. The applicability of this framework has been demonstrated in studies with adults, adolescents, and children (Benish-Weisman, 2015; Scholz-Kuhn et al., 2023; Schwartz, 2012), supporting its use for examining children's value development in educational settings.

Within this framework, achievement—a facet of self-enhancement—reflects striving for success and competence which is recognized and rewarded in society (Schwartz, 1992). This focus on social validation ties achievement to classroom settings, where success and recognition depend on teachers and peers. Previous research found that values are systematically linked to different achievement goal orientations, associating self-direction values (part of openness to change values) to mastery goals and achievement values to performance goals (Levontin & Bardi, 2019). In Swiss elementary classrooms, self-direction and benevolence values were found to be emphasized (Oeschger et al., 2022). Examining children's values within classroom contexts may therefore provide insight into how socially oriented and self-oriented goals are reinforced during development.

1.1. Value development in middle childhood

A growing body of developmental research highlights middle childhood as an important phase for psychological, social, and cognitive development, including the formation of values (Knafo-Noam et al., 2024). Research demonstrates that children as young as five already possess an emerging understanding of values, which becomes increasingly differentiated with age (Döring et al., 2010; Twito-Weingarten & Knafo-Noam, 2022). Importantly, studies indicate that the structural organization of children's values begins to resemble adult value patterns

during middle childhood, with increasing consistency in value choices between ages five and nine (Collins et al., 2017; Misgav et al., 2023; Twito-Weingarten & Knafo-Noam, 2022). At the same time, however, the prioritization and stability of specific values remain developmentally dynamic. Compared to later developmental periods such as adulthood, middle childhood is characterized by a stronger emphasis on self-transcendence values and a lower endorsement of self-enhancement values. At the same time, developmental shifts occur within this period, including decreasing conservation values and increasing openness to change (Cieciuch et al., 2016). In contrast to the relative stability typically observed in adulthood (Leijen et al., 2022), values in middle childhood are more flexible, likely reflecting ongoing neurological and cognitive development, including advances in abstract thinking (Harter, 2015; Knafo-Noam et al., 2024).

1.2. Value transmission within the school context

The school environment, particularly the classroom, plays a vital role in children's value development by exposing them to new social norms, expectations, and relationships that may shape their values (Makarova et al., 2025). Contemporary developmental science conceptualizes classrooms as dynamic systems embedded within broader contexts (Lerner, 2006). From this perspective, and drawing on Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979, 2005), the classroom represents a key microsystem in which proximal processes (e.g., as teacher-student and peer interactions) are central to children's cognitive, social, and emotional experiences and particularly influential for value formation during middle childhood.

Schools contribute to individual value formation and societal cohesion by transmitting cultural values and norms central to democratic ideals (Fend, 2008). We adopt Schönplüg's (2013) broad definition of "transmission," encompassing all intentional and unintentional ways values, attitudes, and behaviors are conveyed in the classroom. Beyond direct teaching, teachers may influence students' values through the quality of their relationships: Warm, supportive ties were found to be empirically linked to academic success, value internalization, and well-being (Hattie, 2015; Hattie & Zierer, 2019; Pianta et al., 2012; Wentzel, 2002). Meta-analytic evidence shows that teacher-student relationships is strongly associated with learning, explaining about 20–25% of achievement variance (Hattie, 2015), and highlight trust and emotional connection as core to effective teaching (Hattie & Zierer, 2019). Such relationships likely foster belonging and prosocial, conservation-oriented values, while reducing self-enhancement tendencies (Barni et al., 2014, 2019; Roorda et al., 2011; Wentzel, 1997). Values may be transmitted in schools explicitly through instruction and implicitly through school culture and teacher modeling (Halstead & Taylor, 2000). Teachers serve as cultural agents who reflect societal values (Schwartz, 1992) and promote value-related behaviors through classroom practices, educational goals, and management approaches (Auer et al., 2023; Barni et al., 2018; Döring et al., 2024; Leenders et al., 2008). Their value education efforts embody personal aims and broader societal norms (Veugelers & Vedder, 2003). Effective teachers, like supportive parents, foster students' social and academic adjustment by creating nurturing classroom environments (Wentzel, 2002). Such relationships promote engagement and development (Pianta et al., 2012), highlighting the need to examine how teacher- and peer-child relationships may shape personal value development.

1.3. Teacher warmth and classroom relationships

Teacher warmth—marked by empathy, responsiveness, and genuine care—is a central aspect of effective teacher-student relationships and supports children's social, emotional, and academic adjustment (Pianta et al., 2012; Wentzel, 1997). Positive teacher-pupil relationships are consistently linked to higher academic achievement and motivation (Roorda et al., 2011; Spilt et al., 2011). From a social learning

perspective (Bandura, 1977), warm teacher–student relationships may support the development of self-transcendence and conservation values by modeling prosocial and cooperative behavior (Barni et al., 2014, 2019). Evidence from family research similarly underscores the role of close relationships and reinforcement in value development (Döring et al., 2017). Thus, teacher warmth functions not only as an interpersonal quality but also as a socializing force shaping children's moral and motivational orientations in the classroom.

Recent evidence underscores that teacher warmth is a key driver of positive classroom relationships and student outcomes (Pianta et al., 2012; Wentzel, 1997). Warm, emotionally supportive interactions can foster trust, belonging, and emotional security, thereby providing a stable base for engagement and learning (Zheng, 2022). Students who perceive their teachers as warm report greater enjoyment, lower anxiety, and higher participation in class (Mainhard et al., 2018). Warmth also extends to the peer ecology—students with warm teacher relationships tend to be more accepted and less rejected by classmates (Hughes & Im, 2016).

At the classroom level, teacher warmth contributes to a positive and protective climate and may help reduce perceptions of unfairness and lack of care among students, particularly those at risk of disengagement (Rucinski et al., 2018). Collectively, these findings highlight that teacher warmth is not only a relational asset but also a pedagogical resource and hence a foundational element that fosters well-being, supportive peer dynamics, and academic success.

1.4. Peer relationships and value development

Peer relationships within classrooms provide a powerful developmental context that may shape value alignment and social behavior through social influence and shared experiences (Bukowski et al., 2011). As children progress through middle childhood, they increasingly distance themselves from parents (Branje, 2018), and their peer interactions and perspective-taking skills become more sophisticated (Knafo-Noam et al., 2024). Through daily interactions and shared activities, peers may influence and challenge children to refine their own values (Benish-Weisman, 2024; Rubin et al., 2015). Empirical evidence shows that peers' values predict children's later values (Benish-Weisman et al., 2022), and longitudinal network research supports both peer selection and socialization effects—particularly for protection-related values in friendship and trust networks (Cieciuch et al., 2024). Value priorities likely also contribute to the formation and maintenance of friendships (Kindschi et al., 2019), underscoring the importance of peer influence in children's value development.

1.5. The current study

This study is the first to longitudinally investigate how key classroom actors—peers and teachers—and children's relationships with them contribute to value development in elementary school. In doing so, it extends prior longitudinal research, which has primarily focused on adolescents rather than younger children (e.g., Benish-Weisman, 2024; Cieciuch et al., 2024). Accordingly, this study followed elementary school children over 1.5 years to examine *intra-individual trajectories of value change longitudinally in middle childhood within the school context*. We anticipate replicating well-established findings that children's individual level values and their change will align with the value structure proposed by Schwartz (1992), where conflicting values change in opposing directions, such that increases in openness to change values are associated with decreases in conservation values (e.g., Cieciuch et al., 2016). As has been found in longitudinal studies with children aged 6–11 years in Poland and Israel (Cieciuch et al., 2016; Daniel et al., 2020, 2023), we expect *values of self-transcendence and openness to change to increase in priority (H1a), as values of self-enhancement and conservation decrease in priority (H1b) over time*. As the second objective and main goal, we examine *the contribution of classroom factors to children's value*

trajectories over-time focusing on key figures within the classroom, i.e., teachers and classmates. We analyze these value trajectories during an important period in children's lives: When they enter elementary school. At this stage, children start spending most of their day in school with teachers and classmates. Importantly, they develop reading and writing skills, enabling them to complete questionnaires and self-reports for the first time. Value transmission may be shaped by individual or relational factors (Schönpflug, 2001, 2013). Transferring the findings of the family context (Döring et al., 2017; Makarova et al., 2018) into the school context, we expect *teachers' value-related educational goals to be associated with children's individual value trajectories over time, such that they will become more similar to the value-related educational goals of their teachers over time (H2)*. Further, within the family context, a family climate of connectedness, and the general quality of relationships have been associated with inter- and intragenerational value transmission (Roest et al., 2009). Applying these findings to the school context, we investigate if factors of the classroom climate, that is the children's perceived relationship dynamics with the teacher and classmates, predict value transmission within the classroom over time. Accordingly, we expect *classroom relationship dynamics, specifically, perceived teacher warmth and felt closeness to the teacher and classmates, to predict later children's value trajectories across multiple assessment waves (H3)*. Classmates are another key source of value transmission, with their influence likely increasing as children grow (Benish-Weisman et al., 2022; Kindschi et al., 2019). We aim to investigate the longitudinal associations between classmates and children's value trajectories. We expect *classmates' values to predict later children's value change over time, such that they will become more similar to those of their classmates over time (H4)*.

2. Method

2.1. Participants and procedure

The present study was embedded within a larger longitudinal investigation of value development in Swiss elementary schools. Data were collected in four waves (from the beginning of first grade in March 2021 through the end of second grade in 2022), with 3–4 months between each wave. In total, 1342 children participated in the study. The study involved 97 classrooms, averaging 13.39 participating pupils per class, with about 25.7% not consenting. Non-participation was due to absence (51), lack of parental consent (334), personal refusal (13), questionnaire difficulties (49), and plausibility checks (21), resulting in a reduced dataset. The smaller sample at T1 resulted from a pilot implementation of a digital survey format with a subset of children ($N_{\text{digital}} = 303$) in preparation for possible COVID-19-related restrictions.¹ Valid analog-format data were available for 834 children at T1 (66% of the total sample), 1184 children at T2 (93%), 1103 children at T3 (87%), and 1102 children at T4 (87%). Children generally remained with the same main classroom teacher across the study period. Of the 834 children who participated at T1, 763 also participated at T2, 703 also participated at T3, and 705 also participated at T4. In total, 614 children participated at all four measurement occasions, representing an adequate longitudinal retention rate (see Teague et al., 2018). The valid analog-format T1 sample included 834 children from 74 classrooms

¹ Assignment to the digital or analog condition occurred at the class level and was not based on child characteristics. Subsequent analyses indicated that the digital version was age-inappropriate and resulted in comprehension difficulties and inconsistent response patterns. Multidimensional scaling analyses revealed poor fit to the expected value structure, suggesting measurement artifacts rather than meaningful value differences. Moreover, children who completed the digital version at T1 showed systematic differences in later value priorities and classroom relationship variables, indicating that these mode-of-assessment effects likely carried forward to subsequent measurement occasions. Therefore, T1 data from the digital condition were excluded from the analyses.

(49.5% girls). Across all participants, 49% were girls, ages ranged from 5.8 to 7.3 years, and the mean age at T1 was 6.82 years ($SD = 0.50$). The proportion of girls closely matched the population average of 48.6% in the first two primary school years (Federal Statistical Office, Switzerland, 2024). After obtaining approval from seven cantons, recruitment took place in elementary schools. Data were collected in group classroom settings by trained assistants. Children without parental consent did not complete the questionnaire but took part in alternative classroom activities. The study was approved by the ethics committee of [University of Basel].

2.2. Measures

2.2.1. Personal values

Children's value priorities were measured with the Picture-Based Value Survey for Children (PBVS-C; Döring et al., 2010), a pictorial assessment instrument, which was developed specifically for younger children to meet their level of cognitive development and well validated within the appropriate age range in numerous studies (e.g., Cieciuch et al., 2016). Children evaluate twenty picture-based items portraying a gender-neutral character, which performs actions related to values (Döring et al., 2010; see Fig. S1). By rating the importance of these values on a five-level response scale, we generated a score for each child on each of the higher-order values: self-transcendence (comprising benevolence, universalism), conservation (conformity, tradition, security), self-enhancement (power, achievement), and openness to change (self-direction, stimulation, hedonism). As a preliminary analysis, we employed multidimensional scaling (MDS) to evaluate the measurement characteristics of the PBVS-C and assess its alignment with Schwartz's (1992) model, which proposes a circular organization of values with opposing poles. MDS is preferred over Cronbach's alpha and a standard procedure for validating value scales (see Cieciuch et al., 2016; Döring et al., 2010, 2016). The results of the last point of measurement replicated Schwartz's (1992) two-dimensional structure of values: A continuum ranging from self-enhancement to self-transcendence values, and a relatively orthogonal continuum from conservation to openness-to-change values, supporting the structural validity of the PBVS-C and its alignment with Schwartz's (1992) theoretical model (Fig. S2).

2.2.2. Classmates' values

For each child, we calculated classmates' average scores on each of the four higher-order values to represent prevailing classroom values, following standard multilevel modeling procedures (Benish-Weisman et al., 2022).

2.2.3. Value-related educational goals

Teachers completed the 21-item Portrait Value Questionnaire (PVQ-21; Schwartz, 1994) to assess the values they wish to promote in pupils. This approach, validated among parents and teachers (Barni et al., 2018; Döring et al., 2017; Oeschger et al., 2024), presents values as portraits. Teachers rated, on a 6-point Likert scale, how much they would like their pupils to resemble each portrait, imagining their preferred student responses. For example, a self-transcendence portrait states: "It is very important to them to help those around them and care for their well-being." The mean alpha scores ranged from 0.69 (self-enhancement) to 0.78 (self-transcendence), indicating acceptable reliability.

2.2.4. Warmth of teacher

Children's perceptions of teacher support, encouragement, and acceptance, i.e., whether the child feels cared for and valued, was measured with the Warmth dimension of the *Young Children's Appraisals of Teacher Support* (Y-CATS) scale (Mantzicopoulos & Neuhauser-Pritchett, 2003). Four items from the original 11-item subscale were selected to measure children's perceptions of being cared for and valued, such as: "My teacher says nice things about my work," "tells me I am smart," "likes me," and "smiles a lot." After a pilot study, we replaced the

original dichotomous format with a 5-point Likert and smiley scale to suit children's early reading skills. Cronbach's alphas range from 0.64 (T1) to 0.72 (T4).

2.2.5. Closeness to teacher/class

Closeness was assessed using an adaptation of the well-established Inclusion of Other in the Self (IOS) scale (Aron et al., 1992), which has been validated for use with children (e.g., Cameron et al., 2006). To ensure developmental appropriateness, we followed a phenomenological approach, emphasizing spatial proximity as a proxy for emotional closeness—a method shown to be valid for young children (Aiello & Aiello, 1974; Burgess, 1981; Marinovic et al., 2017). The IOS was adapted by reducing overlap levels and using familiar pictorial items from the PBVS-C to enhance accessibility (see Supplementary Material, Fig. S3). Pictorial formats are more accessible and engaging for children than abstract shapes or written questionnaires (Christidou et al., 2023; Harter & Pike, 1984; Knafo-Noam et al., 2024). The IOS shows good reliability and validity across age groups, including young children (Cameron et al., 2006). Test-retest reliability for closeness to teacher was 0.37 (single) and 0.70 (average); for closeness to class, 0.34 (single) and 0.67 (average), indicating acceptable reliability for averaged scores—typical for single-item measures with young children (Tanaka et al., 2022). Lower stability is expected at this age (Harter & Pike, 1984), but the measure remains valid, as supported by its correlation with supportive climate (average $r = 0.25$; Berson & Oreg, 2016) and recent reliability findings (Gächter et al., 2015). Further details are provided in the Supplementary Materials.

2.3. Data analysis plan

Growth curve modeling was applied to estimate inter-individual variability in intra-individual patterns of change over time (e.g., Curran et al., 2010). To address our first research objective, we ran unconditional multilevel growth curve models, which characterize the average growth trajectory and individual differences in growth rates without including covariates. The models accounted for students nested within classrooms and controlled for potential bias from unequal participation rates. (Eid et al., 2017). Intraclass correlation coefficients (ICCs) were computed to assess the proportion of variance attributable to classroom-level differences, with values ranging from 0.07 (conservation, openness) to 0.11 (self-enhancement). To address potential Type I error inflation due to the nested data structure (Musca et al., 2011), we employed multilevel modeling and adjusted the alpha level to 0.05, justified by predictor-outcome intercorrelations.

For model selection, we compared no growth, linear, and quadratic models using the R package nlme (Pinheiro et al., 2021). The no growth model included only a random intercept, the linear model added random slopes for time, and the quadratic model further included a random coefficient for time-squared (Eq. S1). The quadratic model provided the best fit for all conditional models (future conservation: $p = .020$; future openness to change: $p = .030$; other models: $p < .001$), therefore quadratic growth was modeled.

To address our main research objective, we extended the models to include individual- and classroom-level predictors (conditional growth curve models; Curran et al., 2010). Predictor variables included perceptions of closeness to teacher and class, teacher warmth (individual level), teachers' value-related educational goals, and classmates' values (classroom level). Teacher and peer variables were included simultaneously to assess their unique and overlapping contributions (see Curran et al., 2004). Gender was included as a control variable. Growth curves model average changes in the outcome over time, accounting for prior states and allowing assessment of whether changes in a predictor are linked to concurrent changes in the outcome. We time-shifted each outcome variable by one measurement to assess directionality. Consequently, any predictor at time t (i.e., time-variant predictors at T1–T3) was used to forecast deviations from the average growth of the outcome

at time $t + 1$ (i.e., children's values at T2 - T4), allowing us to investigate whether past classroom-related factors could predict value trajectories of change. This approach has been successful in previous studies (Duckworth et al., 2010; Hanel et al., 2023; Scholz-Kuhn et al., 2025), and our syntax is based on recent applications of this approach in the field of values (Hanel et al., 2023; <https://osf.io/h6ayu/files/osfstora>). For all conditional models, the quadratic models explained the most variance (future conservation: $p = .020$; future openness to change: $p = .030$; other models: $p < .001$).

Additionally, we conducted exploratory moderation analyses by including interaction terms in the growth curve models to assess whether associations varied by the moderator. (Curran et al., 2004). Specifically, we tested whether the associations between classmates' values and children's value trajectories were moderated by children's perceived closeness to their class, and whether the relationships between teachers' value-related educational goals and children's values were moderated by children's perceptions of teacher warmth or closeness.²

2.4. Missing data and attrition

Missing values in the dataset ranged from 0% (for teacher-rated variables) to 21% (for child-rated variables). Two sources of missingness were present. First, implementation-related missingness occurred at T1 because a subset of children completed a digital pilot version of the assessment during the COVID-19 period. Because the digital administration format yielded a values structure that deviated from the expected pattern and showed poorer MDS fit compared with the analog administration (see Supplementary Material, Figs. S6–S7), these observations were excluded from T1 analyses. However, these children could still contribute valid observations at later waves after returning to the analog assessment format. Second, longitudinal missingness resulted from nonparticipation at individual assessment waves.

Teacher questionnaires were completed by all participating teachers at T1, resulting in complete data for teacher-rated variables, whereas child participation varied across time points, leading to missingness in child-rated variables. Child participation was $N = 834$ at T1, $N = 763$ at T2, $N = 703$ at T3, and $N = 705$ at T4, corresponding to missingness rates of 0%, 8.5%, 15.7%, and 15.5%, respectively. Examination of missingness patterns indicated that missing child-reported data primarily reflected nonparticipation at a given assessment wave rather than selective missingness on individual study measures. For the values measures, missingness corresponded almost entirely to wave nonparticipation, with only limited additional missingness observed for some classroom relationship measures.

To examine longitudinal attrition within the valid analog-format T1 sample, we compared children who participated at T1 and were retained across all four waves ($n = 614$) with those who were not retained across all waves ($n = 220$). These groups did not differ significantly in baseline child-rated values, perceived closeness to the class, perceived closeness to the teacher, or teacher warmth, all $p > .240$. They also did not differ in teachers' value-related educational goals, except for self-enhancement goals, which were higher among children who were not retained across all waves, $t(325.28) = 2.48$, $p = .014$. Thus, attrition after T1 appeared largely unsystematic with respect to the main child-reported study variables, although some limitations regarding generalizability cannot be fully excluded.

Little's MCAR test indicated that the overall missingness pattern

across the primary study variables in the valid analog-format T1 sample was not fully consistent with a strict MCAR assumption, $p = .017$. However, supplementary attrition analyses suggested that later longitudinal missingness was largely unrelated to the primary baseline child-reported variables examined in the present study.

Models were estimated using maximum likelihood (ML) in the *nlme* package in R. Following prior applications of this multilevel modeling approach in values research (e.g., Hanel et al., 2023; Scholz-Kuhn et al., 2025), missing data were handled using *na.omit* within model estimation. Specifically, observations with missing values on variables included in a given model were excluded on a row-wise basis, while participants with partially observed longitudinal data could still contribute available observations to the analyses. As a result, the number of observations, pupils, and classrooms varied across models depending on data availability (see Table 2).³

Standardized coefficients (β) were computed post hoc using the *standardize_parameters()* function from the R package *parameters* (Lüdtke et al., 2020) to facilitate comparison of effect magnitudes across predictors. Unstandardized estimates are reported in Table 2, and standardized coefficients are provided in Supplementary Table S2. Statistical significance tests were conducted to compare all fitted models.

The dataset and R syntax to reproduce the longitudinal analyses are available on https://osf.io/sznx9/overview?view_only=7d54da6965104e1c8f1ee4e4d2322f52

3. Results

3.1. Descriptive statistics and correlational analyses

Means and standard deviations of the study variables are presented in Table 1. Correlations are presented in Supplementary Table S1. Self-transcendence values were the most important values, whereas self-enhancement values were the least important. The means for value-related educational goals indicated that, across time, self-transcendence values were the most important values teachers wanted to transmit to their pupils, whereas self-enhancement values were the least important. Among classroom-related variables, closeness to the teacher and class remained stable over time, whereas perceived teacher warmth decreased. The pattern of correlations for personal values was consistent with Schwartz's theory (Schwartz, 1992): opposing values showed negative within-time correlations. Correlations of children's values between adjacent measurement points were positive, highlighting a consistent trend in children's value priorities. For example, self-transcendence correlated positively with conservation ($r = 0.07$, $p < .001$) and negatively with self-enhancement ($r = -0.55$, $p < .010$) and openness to change ($r = -0.31$, $p < .01$). Self-transcendence and conservation values were mostly positively correlated with closeness to class ($r = 0.11$, $p < .001$; $r = 0.07$, $p < .001$, respectively), closeness to teacher ($r = 0.13$, $p < .001$; $r = 0.10$, $p < .001$), and teacher warmth ($r = 0.08$, $p < .001$; $r = 0.03$, $p < .050$). In contrast, correlations between self-enhancement or openness to change values and closeness to class, closeness to teacher, and teacher warmth were predominantly negative or statistically non-significant (e.g., self-enhancement with closeness to teacher $r = -0.06$, $p < .001$; openness to change with closeness to teacher $r = -0.14$, $p < .001$). Correlations between children's values and teachers' value-related educational goals were generally small and mostly statistically non-significant.

² Age was not included as a covariate in the growth curve models. In longitudinal growth modeling, developmental change is typically represented by time (Curran et al., 2010). As all children entered school within the same academic year, age substantially overlapped with time and grade level and would have added redundancy. Accordingly, age was excluded a priori rather than based on empirical multicollinearity testing.

³ Although full information maximum likelihood (FIML) is sometimes recommended when data are assumed to be MAR rather than MCAR, we retained the present multilevel modeling approach to ensure comparability with prior studies using this framework. Given the large sample size and the largely unsystematic patterns of longitudinal missingness observed within the valid analog-format T1 sample, any resulting bias was unlikely to substantially affect inference.

Table 1
Means and standard deviations of study variables.

Variable	Time 1 <i>M (SD)</i>	Time 2 <i>M (SD)</i>	Time 3 <i>M (SD)</i>	Time 4 <i>M (SD)</i>
<i>Children's values</i>				
	<i>N</i> = 834	<i>N</i> = 763	<i>N</i> = 703	<i>N</i> = 705
Self-transcendence	3.42 (0.52)	3.49 (0.50)	3.57 (0.49)	3.57 (0.49)
Self-enhancement	2.62 (0.68)	2.39 (0.65)	2.24 (0.60)	2.19 (0.56)
Openness to change	2.98 (0.41)	3.01 (0.41)	3.04 (0.42)	3.10 (0.42)
Conservation	3.00 (0.40)	3.07 (0.39)	3.08 (0.38)	3.06 (0.40)
<i>Teachers' value-related educational goals</i>				
	<i>N</i> = 74	<i>N</i> = 74	<i>N</i> = 74	<i>N</i> = 74
VrEG Self-transcendence	5.47 (0.60)	5.43 (0.80)	5.40 (0.68)	5.46 (0.50)
VrEG Self-enhancement	3.23 (1.02)	3.33 (0.94)	3.35 (0.99)	3.36 (0.97)
VrEG Openness to change	4.70 (0.64)	4.59 (0.70)	4.64 (0.77)	4.64 (0.61)
VrEG Conservation	3.68 (0.97)	3.96 (0.90)	4.01 (0.88)	3.96 (0.80)
<i>Children's classroom relationship perceptions</i>				
	<i>N</i> = 830	<i>N</i> = 746	<i>N</i> = 689	<i>N</i> = 693
Closeness to teacher	2.65 (0.56)	2.63 (0.55)	2.68 (0.54)	2.69 (0.52)
Warmth of teacher	4.42 (0.65)	4.34 (0.69)	4.31 (0.68)	4.29 (0.69)
Closeness to class	2.68 (0.52)	2.68 (0.51)	2.70 (0.49)	2.64 (0.53)

Note: Abbreviations: *M*, mean; *SD*, standard deviation; VrEG, value-related educational goals. Descriptive statistics are based on the valid analog-format T1 sample. *N*s vary across waves and variables because participants with partially observed longitudinal data contributed available observations to the analyses.

3.2. Intra-individual trajectories of value change

The quadratic model explained additional variance over the no

Table 2
Value change trajectories and classroom contributions (fixed effects, unstandardized).

	Self-transcendence			Self-enhancement			Conservation			Openness to change		
	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>	Estimate	SE	<i>p</i>
<i>Intra-Individual Trajectories of Value Change¹</i>												
Intercept	2.28	0.04	<0.001	1.97	0.05	<0.001	1.89	0.04	<0.001	1.95	0.03	<0.001
Time	0.17	0.03	<0.001	−0.38	0.04	<0.001	0.11	0.03	<0.001	0.03	0.03	0.325
Time-squared	−0.02	0.01	<0.001	0.05	0.01	<0.001	−0.02	0.01	<0.001	0.00	0.01	0.703
<i>Individual-Level Factor</i>												
Gender	0.27	0.02	<0.001	−0.26	0.03	<0.001	0.12	0.02	<0.001	−0.13	0.02	<0.001
<i>Contribution of Classroom Factors to Future Trajectories of Value Change²</i>												
Intercept	1.01	0.17	<0.001	0.96	0.16	<0.001	1.55	0.14	<0.001	1.60	0.15	<0.001
Time	0.26	0.09	<0.001	−0.09	0.11	0.434	−0.02	0.06	0.761	−0.04	0.07	0.561
Time-squared	−0.06	0.02	<0.001	0.02	0.03	0.411	0.00	0.01	0.928	0.02	0.02	0.267
Teachers' VrEG	0.00	0.01	0.904	−0.02	0.01	0.124	0.00	0.01	0.964	0.00	0.01	0.655
Closeness to Teacher	−0.01	0.02	0.400	−0.02	0.02	0.416	0.05	0.01	<0.001	−0.04	0.01	0.008
Warmth of Teacher	0.02	0.01	0.082	−0.04	0.02	<0.001	−0.01	0.01	0.593	0.01	0.01	0.234
Closeness to Class	0.08	0.02	<0.001	−0.01	0.02	0.816	0.02	0.01	0.166	−0.06	0.02	<0.001
Classmates' Values	0.40	0.06	<0.001	0.52	0.05	<0.001	0.19	0.06	<0.001	0.30	0.06	<0.001

Note. Bold values indicate $p < .001$. ¹ Analytic sample sizes varied across models because observations with missing values on variables included in a given model were excluded during estimation: N_{Classes} : 96; N_{Pupils} : 1282; ² N_{Classes} : 94; N_{Pupils} : 1125; VrEG = Value-related educational goals. These estimates are unstandardized coefficients. Corresponding standardized coefficients (β) are provided in Supplementary Table S2.

growth and the linear growth model for all four tested predictions ($p < .001$). (Table 2, Fig. S4). As hypothesized (H1a), the analyses revealed that self-transcendence values started at a moderate level and increased gradually, with the rate of increase slowing over time. Similarly, openness to change values showed a stable level with no strong increasing or decreasing trend across the study period (Table 2). As hypothesized (H1b), self-enhancement values declined over time, with the rate of decline decelerating. Conservation values increased gradually, but this increase also slowed over time.

Contribution of Classroom Factors to Future Trajectories of Value Change.

In these analyses, predictors and outcomes always referred to the same value dimension (e.g., teachers' self-transcendence value-related educational goals as the predictor and children's self-transcendence values as the outcome). All primary statistics are reported in Table 2, which presents the unstandardized coefficients. Supplementary Table S2 provides corresponding standardized coefficients (β) for reference and comparison of effect magnitudes across models.

No statistically significant relationship was found between teachers' value-related educational goals and children's value trajectories. That means that H2 was not supported.

Further, the results indicated that children's general perception of closeness to teacher and class partially predicted children's future value trajectories, partially supporting H3. Key effects are reported here for clarity. Full standardized and unstandardized results for all models are provided in Table 2 and Supplementary Table S2 (see also Fig. S5). Based on standardized coefficients (β), the closer the children felt to their teacher, the more they later valued conservation ($\beta = 0.07$) and the less they valued openness to change ($\beta = -0.05$). Next, children's perceived warmth of their teacher negatively predicted self-enhancement trajectories in the future ($\beta = -0.05$). Moreover, children's general perception of closeness to class positively predicted children's self-transcendence trajectories ($\beta = 0.07$), and it negatively predicted openness to change trajectories ($\beta = -0.05$).

Strong support was found for hypothesis 4, indicating an association between classmates and children's value trajectories. Classmates' values positively predicted an increase in the trajectories of all four higher-order values. These effects were the strongest among all classroom predictors, particularly for self-enhancement ($\beta = 0.25$) and self-transcendence ($\beta = 0.16$), indicating that children became more similar to classmates who prioritized these higher-order value types.

We explored whether the association between classmates' values and children's value trajectories was stronger for children who felt closer to their class, and whether the relationship between teachers' value-related educational goals and children's values was moderated by children's perceptions of teacher warmth or closeness. None of these moderations were statistically significant.

Gender was included as a control variable and predicted all value dimensions: girls scored higher on self-transcendence and conservation, boys on self-enhancement and openness to change (Table 2). Including gender did not alter main findings: classmates' values consistently predicted value changes; some classroom relationship effects were statistically significant, whereas teacher-related factors were not.

4. Discussion

This research offers important new insights into trajectories of value change in elementary school and the contributions of classroom factors to these trajectories. Consistent with prior research, self-transcendence values were the most highly prioritized and self-enhancement values the least important. This pattern mirrors findings observed in adults (Bardi & Schwartz, 2003) and in children aged six to 11 years (Döring et al., 2016). Beyond replicating previously observed developmental trends, we identified several important predictors of value change. Specifically, we found that children's values became substantially more similar to their classmates' values; that feeling close to the class predicted a later increase in self-transcendence and a decrease in openness to change value priorities; that feeling close to the teacher predicted a later decrease in openness to change value priorities and an increase in conservation value priorities; and that seeing the teacher as warm predicted a later increase in self-transcendence and decrease in self-enhancement value priorities. Thus, the study revealed important classroom processes that contribute to value development.

Our longitudinal study showed that, in elementary school children, openness to change and self-transcendence value priorities increased over time, as did conservation value priorities, although increases in both self-transcendence and conservation value priorities leveled off at later time points. In contrast, self-enhancement value priorities decreased. These results align with prior research indicating that independence and curiosity are prioritized over tradition and conformity in middle childhood (Cieciuch et al., 2016; Daniel et al., 2023), reflecting cognitive growth and the onset of adolescent identity exploration (Harter, 1999). The results also confirm that children's value hierarchies resemble those of adults, with self-transcendence ranked highest and self-enhancement lowest, consistent with previous cross-cultural evidence (Döring et al., 2015). Notably, we also observed gender differences in value orientations, consistent with earlier findings (e.g., Scholz-Kuhn et al., 2023; Schwartz & Rubel, 2005), though not the study's focus.

Our main objective, therefore, was to examine how classroom-microsystem factors, such as values and relationships, were associated with children's value priority progression during early school development.

First, the results regarding the contribution of teachers' value-related educational goals to children's value trajectories were not statistically significant. Our study focused on teachers' educational goals rather than their personal values, which may differ from one another as shown in the case of parents (Benish-Weisman et al., 2013). Similar to Astill et al. (2002), our results were not statistically significant. Within the family context, prior research indicates that parents' value-related educational goals are linked to children's values (e.g., Knafo & Schwartz, 2003). Yet, when societal values are controlled for, parent-child value similarity is no longer evident (e.g., Döring et al., 2017; Makarova et al., 2018). Teachers are also socializing agents, attempting to transmit values that are prioritized in their society (Oeschger et al., 2024). Our findings suggest that teachers are less successful in intentionally transmitting their value-related educational goals within their institutionalized role,

though there is evidence, in our study and others (e.g., Auer et al., 2023), for potential unintentional influence.

Specifically, children's felt closeness to their teacher and classmates played a role in their value trajectories later on. Consistent with Herzog's (2002) emphasis on the relational nature of teacher-student interactions, our findings point to meaningful associations between classroom relationships and children's value development. Greater felt closeness to the teacher was associated with increased conservation and decreased openness to change value priorities over time, consistent with prior research on teacher caring and relational pedagogy (Noddings, 1992; Wentzel, 1997). The negative association with openness to change may seem counterintuitive. Close teacher-student relationships may foster values, such as obedience and conformity, which Schwartz's (1992) theory identifies as opposing openness to change values like creativity and independence. Prior research similarly shows that strong teacher-student relationships can promote compliance and tradition (Barni et al., 2014, 2019), whereas highly structured classrooms may limit autonomy and creative expression (Veugelers & Vedder, 2003). Thus, although teacher closeness generally supports pupils' social and academic adjustment, it may also unintentionally discourage autonomy-oriented values. This interpretation remains tentative given the correlational design and the possibility that children predisposed toward conservation values perceive greater closeness to teachers (Knafo & Schwartz, 2003).

Our results show that children who perceived their teacher as warmer were less likely to prioritize self-promotion over time, aligning with social learning theory, which highlights the role of teacher modeling in fostering prosocial behavior (Bandura, 1977), as well as empirical evidence linking teacher support to increased altruism and prosociality in students (Barni et al., 2014, 2019). Although these associations were smaller than those observed with classmates' values, as indicated by standardized coefficients (see Supplementary Table S2), this difference should be interpreted cautiously, as teacher and peer effects could not be fully disentangled within classrooms. Shared contextual factors (e.g., classroom climate) may have contributed to both effects. In particular, teacher warmth was positively associated with children's value trajectories, in line with evidence that supportive teacher-student relationships enhance students' learning and well-being (Hattie, 2015; Hattie & Zierer, 2019). However, associations involving closeness to teachers were more nuanced. These findings extend prior work by demonstrating that classroom relationships are relevant not only for academic outcomes but also for children's emerging value priorities. Our study suggests that the enhanced learning associated with closeness to teachers may be limited to learning through following directions, rather than learning to be an independent thinker.

Furthermore, the analysis showed that how close children felt to their classmates positively predicted self-transcendence and negatively predicted openness to change value trajectories in the future. Strengthening children's associations with their classmates could promote the adoption of certain values over time. For example, higher self-transcendence values, which are social focus values, express a growth motivation, and reflect care for others' well-being over self-interests, may increase prosociality, which in turn helps to build and maintain relationships (Schwartz, 2012). Conversely, greater closeness to classmates may lead to lower openness to change values, which are personally focused values, and reflect self-interest, and are linked to self-concern. Self-direction values (part of openness to change values) are about independence of thought, and it is also possible that at this young age, children who value independent thinking end up feeling less close to other children due to associating closeness with lack of critiques over others. As above, genetic predispositions may be associated with both peer closeness and openness to change values; intervention studies are needed for firmer conclusions.

Finally, and most importantly, our results align with research highlighting the critical role of classmates in value formation, even during middle childhood (Benish-Weisman et al., 2022; Uzevsky et al., 2016).

Most of the research on peer influence and value socialization has focused on late childhood and adolescence, developmental periods during which children increasingly reflect on their identity and values (Cieciuch et al., 2024; Daniel et al., 2020). However, recent evidence indicates that peer-related patterns are already observable in younger children (e.g., Benish-Weisman et al., 2022). Emerging findings further suggest that peer socialization of attitudes and behavioral orientations is evident in early and middle childhood, with effects observable in social judgments and friendship processes (Monks & Rix, 2024; Nicolay et al., 2025). Building on this foundation, the present study extends existing evidence of peer influence to the domain of value socialization in the early elementary years. Longitudinal and meta-analytic studies demonstrate that peers have effects on a broad range of developmental outcomes, including academic achievement, externalizing and internalizing behaviors, and social competence (Giletta et al., 2021; Ladd, 1999; Rambaran et al., 2017). Moreover, evidence suggests that children's values tend to become more similar to those of their peers over time, not necessarily through deliberate friend selection, but through processes of social learning and shared classroom experiences (Benish-Weisman, 2024; Cieciuch et al., 2024). The present findings indicate that such convergence is evident across value domains and already observable at the classroom level in middle childhood, thereby replicating and extending prior findings from older age groups (Astill et al., 2002; Benish-Weisman et al., 2022; Cieciuch et al., 2024).

5. Limitations

Despite its important implications, this study has several limitations. The analysis method may have slightly inflated the results by including children's values twice: once as a predictor (the average class value, which includes the individual child) and once as the outcome (the child's own value score). Although this analytic approach may have slightly inflated effect sizes, each child's contribution to the classroom average was minimal, and the use of multilevel, time-lagged growth models reduces shared-method bias. Thus, findings should be interpreted in terms of directional associations rather than precise effect magnitudes.

Data collection occurred during the COVID-19 pandemic, which likely contributed to higher levels of missing data due to school absences and disruptions. However, attrition rates were not higher than those reported in other longitudinal studies on children's values conducted outside pandemic conditions (e.g., Berson & Oreg, 2016). Additional analyses suggested that longitudinal missingness within the valid analog-format T1 sample was largely unsystematic with respect to the main child-reported baseline variables. Nevertheless, some limitations regarding generalizability cannot be fully excluded. In particular, the implementation-related exclusion of the digital T1 subsample may have introduced selection effects that cannot be fully assessed, and the final analytic sample may therefore not fully represent all children and classrooms originally recruited during the COVID-19 period. Finally, although our new measure of children's perceived closeness to teacher and class produced meaningful results, more advanced statistical approaches could provide additional insights. Social network analysis, for example, would help to fully understand the impact of social relationships on value development (Kindschi et al., 2019).

6. Conclusion

This study provides longitudinal evidence that children's values increasingly align with those of their classmates during the early years of elementary school, underscoring peers as a key socializing influence already in middle childhood. In addition, feeling close to classmates and perceiving teachers as warm were associated with increases in self-transcendence values and decreases in self-enhancement or openness to change values over time, whereas closeness to teachers was associated with higher conservation and lower openness to change value priorities. In contrast, teachers' explicit value-related educational goals were not

related to value change. These findings suggest that values in school are shaped less through direct instruction and more through everyday social interactions and relational classroom climates. Future research using more fine-grained relational and intervention-based designs may clarify the mechanisms through which classroom dynamics affect children's value development.

CRediT authorship contribution statement

Ricarda Scholz-Kuhn: Writing – original draft, Methodology, Formal analysis, Data curation, Conceptualization. **Elena Makarova:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Anat Bardi:** Writing – review & editing, Supervision, Funding acquisition, Conceptualization. **Maya Benish-Weisman:** Writing – review & editing, Formal analysis. **Anna K. Döring:** Writing – review & editing, Supervision, Funding acquisition, Formal analysis, Conceptualization.

Ethics statement

Ethical approval was obtained from the Ethics Committee of the University of Basel. The participants provided their written informed consent to participate in this study.

Declaration of generative AI and AI-assisted technologies in the writing process

The authors used Perplexity for translation and rephrasing, reviewed and edited the content, and take full responsibility for the publication.

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Declaration of competing interest

All authors declare that they have no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.cedpsych.2026.102480>.

Data availability

The link to the OSF repository is now included in the manuscript.

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