Values and Prosociality in Middle Childhood: A Longitudinal Examination of Costly Sharing and Non-Costly Giving

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Abstract

This study examined the direction of relations between values and prosocial sharing during middle childhood. A total of 299 children participated (age at first time point in months: $M_{\text{first grade}}$=80.49, *SD*=4.16; $M_{\text{second grade}}$=92.98, *SD*=4.84; 53% female, 47% male) completed a values questionnaire and participated in a resource allocation task over four annual assessments. A random-intercept cross-lagged panel model revealed stable associations between the variables. Prioritizing others' welfare (self-transcendence values) was associated with increases in costly sharing over time, to a stronger extent than costly sharing was also associated with later increases in self-transcendence values. These reciprocal effects were not observed for non-costly giving or self-enhancement values. The findings underscore the role of values in relations to prosocial sharing development, even in middle childhood.

Keywords: values, prosocial behavior, costly sharing, non-costly giving, longitudinal study.

Public significance statement: This study demonstrates that over time, children's values of care for others predict their willingness to share resources with other children, more so than sharing experiences shape their values. These findings suggest that fostering values of care and generosity during elementary school years may be effective for promoting generous behavior, providing guidance for parents and educators seeking to cultivate prosocial development in children.

Values and Prosociality in Middle Childhood: A Longitudinal Examination of Costly Sharing and Non-Costly Giving

While values and prosocial behavior are often conceptualized as relatively stable constructs in adulthood (Schwartz, 1992, 2012), their developmental trajectory in middle childhood remains an area of active inquiry (Daniel et al., 2020; Elizarov et al., 2024; Flynn et al., 2015). This pivotal stage is characterized by expanding social networks and the emergence of more sophisticated moral reasoning (Eisenberg et al., 2006; Eisenberg et al., 2015), and as such, it provides a unique opportunity to examine the dynamic interplay between internalized values and outward actions. Children in this age group are increasingly capable of grasping abstract concepts such as fairness and empathy (Davidov et al., 2016), yet their values often remain closely tied to concrete experiences and social feedback (Misgav & Daniel, 2022; Shachnai & Daniel, 2020). This raises fundamental questions about the role of values as motivational goals: do prosocial acts stem from pre-existing values, or do these early behaviors of kindness and generosity actively shape and mold a child's developing values system (Knafo-Noam et al., 2024)? Unraveling these complex relations will lead to a deeper understanding of how values and behavior interact and evolve during this formative period, informing our comprehension of the foundations of moral development. We examined the directionality of the relations between values and prosocial behavior in middle childhood by focusing on the prosocial behaviors of costly sharing, involving personal sacrifice, and non-costly giving, which involves no personal loss.

Values in Middle Childhood

Values are abstract and desirable goals that serve as guiding principles in people’s lives (Schwartz, 1992, 2012). These desirable goals, such as care, ambition, safety, and independence, transcend specific situations and are applied by individuals across various contexts of their lives and throughout the life course. In research around the world, the same

set of values has been identified, reflecting universal concerns. All values are desirable, but individuals prioritize some over others. Values can be compatible with other values, or they can be conflictual, thus enhancing the pursuit of some while reducing the pursuit of others (Sagiv & Schwartz, 2022; Schwartz, 2016). An important axis in the latter context contrasts the values of self-transcendence and self-enhancement (Bardi & Schwartz, 2003; Sagiv et al., 2017). Self-transcendence values emphasize the importance of the well-being of close others and of the social and the natural world, while self-enhancement values emphasize the importance one assigns to the promotion of personal interests, including success, and control of material and social resources.

Until recently, researchers assumed values, as internal and abstract motivations, only emerge during adolescence (Erikson, 1968; Harter & Leahy, 2001). Accordingly, most developmental research on values has focused on this age group (Knafo-Noam et al., 2024; Twito-Weingarten & Knafo-Noam, 2022). However, recent theoretical and methodological advancements suggest children as young as five can report meaningful values (Daniel et al., 2020; Elizarov et al., 2024; Lee et al., 2017), with these values becoming increasingly stable over time (Cieciuch, et al., 2016; Daniel et al., 2024). The interrelations between children's values mostly mirror those of adults; thus, children who hold a particular value more than their peers are also more likely to hold compatible values and less likely to prefer opposing ones (Abramson et al., 2018; Cieciuch et al., 2016; Uzefovsky et al., 2016). Although children's understanding of values may be more concrete initially, their ability to articulate abstract motivations increases with age (Misgav et al., 2023; Shachnai & Daniel, 2020). Similarly, younger children are more likely to refer to their values in terms of observable behaviors; as they grow older, they increasingly refer to them in terms of motivation for mental states generally and behavior specifically (Misgav et al., 2023; Shachnai & Daniel, 2020).

Values and Prosocial Behavior

Values consistently influence behaviors and play a significant role in guiding individual actions (Daniel et al., 2015; Schwartz, 2010). Among adults, values serve as critical considerations when making decisions about various daily activities, from recycling and allocating study time to making life-shaping choices such as career selection (Arieli et al., 2014; Sagiv et al., 2011; Vecchione, Schwartz et al., 2016). Importantly, experimental studies suggest a causal role of values in promoting behaviors (Amit & Sagiv, 2013; Maio, 2010; Sagiv et al., 2011)

Prosocial behavior is a general category, comprised of different types of actions, such as helping, sharing, comforting, and cooperation (Dunfield & Kuhlmeier, 2013). Prosocial behavior is defined as an intentional and voluntary action that benefits others (Dunfield & Kuhlmeier, 2013; Eisenberg et al., 2006; Eisenberg et al., 2015; Grusec et al., 2002). It can be driven by various factors, such as empathy, adherence to social norms, or a sense of fairness (Davidov et al., 2016). In general, however, prosocial behavior is driven by a focus on the needs of others, including other-focused reasoning as well as emotions (Grueneisen & Warneken, 2022; Malti et al., 2009). As a result, values of self-transcendence—the aspiration to contribute to the well-being of others, which is distinguished by benevolence's focus on the in-group and universalism's on all people (Schwartz, 2012)—were hypothesized to relate positively with prosocial behavior.. In contrast, values of self-enhancement, the aspiration to promote the interests of the self even at the expense of others, were hypothesized to relate negatively with prosocial behavior. In line with this contention, studies among adults have found positive associations between prosocial behavior and self-transcendence values (Caprara et al., 2012; Daniel et al., 2015; Lake et al., 2024), and negative associations between prosocial behavior and self-enhancement values (Benish-Weisman et al., 2019; Scholz-Kuhn et al., 2023).

This hypothesized negative relationship with self-enhancement warrants careful consideration, as the link is not always straightforward. In public or strategic contexts, for example, prosocial acts can serve self-enhancing goals, such as gaining status or controlling resources (Carlo & Padilla-Walker, 2020; Hawley, 2002). Our study, however, employs a resource-allocation paradigm designed to minimize these social-strategic motivations. Because the recipient is an unknown child, the allocation is private from peers, and the interaction is not repeated, concerns about reputation and reciprocity are largely absent. In this context, sharing behavior is more likely to reflect the fundamental motivational conflict between prioritizing the self (self-enhancement) and benefiting others (self-transcendence). It is for this reason that we hypothesized a direct negative association in our study. Although laboratory-based, this paradigm is a standard and widely used tool in developmental science for the controlled assessment of prosocial tendencies and sharing behavior (e.g., Fehr et al., 2008; Ibbotson, 2014).

While the link between values and prosocial behavior is well-established in adults, research exploring this relation in children, particularly those in middle childhood, remains limited (Abramson et al., 2018; Benish-Weisman et al., 2019; Daniel et al., 2020; Scholz-Kuhn et al., 2023). Yet children exhibit patterns similar to those of adults, with self-transcendence values positively associated with prosocial behavior (Benish-Weisman et al., 2019; Abramson et al., 2018) and self-enhancement values showing a negative association (Benish-Weisman et al., 2015). However, these findings are largely based on cross-sectional designs (Abramson et al., 2018; Benish-Weisman et al., 2019; Scholz-Kuhn et al., 2023) and self-report measures (Vecchione, Döring et al., 2016), limiting the ability to draw conclusions about the direction of effects.

In middle childhood, values tend to be more concrete and behaviorally driven than in later years (Knafo-Noam et al., 2024; Shachnai & Daniel, 2020). This raises a fundamental

question: does prosocial behavior in middle childhood stem from pre-existing values, or do these early acts of kindness and generosity shape and reinforce values over time? Longitudinal studies conducted among adolescents have suggested a bidirectional relation, in which values predict future behaviors, and behaviors, in turn, reinforce or reshape values, though to a lesser extent (Benish-Weisman et a l., 2019; Vecchione, Döring et al., 2016). This implies that early prosocial acts could play a formative role in shaping a child's developing values system.

Research distinguishes between different types of sharing based on the cost to the sharer. Costly sharing involves giving up one's own resources, creating a conflict between self-interest and kindness or conformity to social norms (Abramson et al., 2018; Davidov et al., 2016; De Waal, 2008). In contrast, non-costly giving allows benefiting others without personal sacrifice (Abramson et al., 2018). This distinction is developmentally significant—non-costly giving emerges earlier and occurs more frequently than costly sharing across childhood (Benenson et al., 2007; Fehr et al., 2008). While both behaviors benefit others, costly sharing presents a genuine motivational conflict between self-interest and other-interest that may more strongly reflect internalized values. Research suggest that high-cost prosocial behavior, which requires individuals to sacrifice their own resources, is more indicative of a developed moral identity and is more closely linked to internalized moral traits than is low-cost helping, which may be driven by social norms or expectations (Padilla-Walker et al., 2015). Because costly sharing requires a stronger internal motivation to overcome self-interest, it may be a clearer behavioral indicator of a child’s personal value priorities. Warneken and Tomasello (2006) demonstrated that even young children readily help others without personal cost, but Fehr et al. (2008) found that willingness to share at a cost to oneself develops more gradually between ages 3-8 years. This developmental pattern

suggests that costly and non-costly prosocial behaviors may have distinct relationships with underlying value systems.

The normative context of sharing situations may create a second differentiation between costly sharing and non-costly giving. Social norms are associated with children's sharing decisions (House, 2018). In cases of non-costly giving, social norms encouraging sharing may be stronger than in cases of costly sharing. These social norms can limit the association between values and sharing behavior (Sagiv & Roccas, 2021). As a result, individual differences in personal values may be less expressed in children's actual sharing behavior (Abramson et al., 2018). This suggests that costly sharing situations, which present a genuine conflict between self-interest and prosociality, may better reveal children's internalized values than situations where sharing is normatively expected and carries no personal cost.

The Current Study

We investigate the association between values and prosocial sharing in middle childhood. We hypothesize that self-transcendence values will be positively associated, and self-enhancement values negatively associated with prosocial sharing behavior. Middle childhood represents a critical developmental period when children's moral reasoning advances significantly and their value systems begin to stabilize (Daniel et al., 2024), making it an optimal time to examine how values and prosocial behavior influence each other over time. We aim to explore the stability of the association over time and investigate the direction of association: whether values are associated with later prosocial sharing behavior, behavior is associated with later values, or both. Last, we differentiate between costly sharing (involving personal sacrifice) and non-costly giving (involving no personal loss),

hypothesizing stronger associations between values and behavior in the case of costly sharing.

We employed a state-of the art random intercept cross-lagged panel model (RI-CLPM; Hamaker et al., 2015; Usami et al., 2019) to analyze both within-person and between-person effects over time across four measurement waves.

Method

Participants

Analysis code and data are publicly accessible at https://osf.io/hq9w6/?view_only=cc75f1ab83c94806a354fe9551b1614c . The study hypotheses and analyses were not preregistered. Participants were drawn from a longitudinal research project that included children from six schools in the central region of Israel. Two cohorts of children entered the study in first and second grades and participated through fourth and fifth grades, yielding four time points of data collection. Participating schools were selected from the list of elementary schools in the central region of Israel. They were classified in the top three deciles of socioeconomic development (high-medium high) by the Israeli Ministry of Education.

The total sample across all time points comprised $N = 299$ children, though not all participants contributed data at every time point. All participants in this study identified as either female or male. At Time 1, n = 265 children participated. Due to technical issues and the onset of the COVID-19 pandemic, one school was removed from the study, and data collection was interrupted mid-year at Time 2, resulting in $n = 176$ participants at the second time point. Retention rates fluctuated across subsequent time points, with 194 children at Time 3 and 172 children at Time 4. Table 1 provides the means and standard deviations for participants' age in months and the gender distribution at each time point.

Table 1

Means and Standard Deviations of Participants' Age in Months and Gender Distribution at Each Time Point

Time Point	Grade	Mean Age in Months (SD)	Gender	
			Female N (%)	Male N (%)
1	1st	80.49 (4.16)	140 (53%)	125 (47%)
	2nd	92.89 (4.84)		
2	2nd	89.27 (4.15)	96 (55%)	80 (45%)
	3rd	101.95 (5.48)		
3	3rd	105.04 (4.20)	101 (52%)	93 (48%)
	4th	118.48 (5.15)		
4	4th	115.84 (4.37)	89 (52%)	83 (48%)
	5th	128.69 (4.68)		

Measures

Values

We used the Picture-Based Value Survey for Children (PBVS–C; Döring et al., 2010) to assess values (see Figure 1 for an illustration). This instrument uses the framework of Schwartz's theory of universal human values and has demonstrated differentiated structural value patterns consistent with Schwartz's theory in children aged 5 to 12 (Abramson et al., 2018). The PBVS-C measures the ten Schwarz values, that can be aggregated to four higher-order value dimensions: Self-Enhancement (Power and Achievement), Self-Transcendence (Benevolence and Universalism), Openness to Change (Hedonism, Stimulation, and Self-Direction), and Conservation (Tradition, Conformity, and Security).

The survey comprises 20 pictures, each representing an individual value and accompanied by a short caption. This design enhances children's comprehension of the concepts. In each picture, the same character engages in a value-relevant action. The values are introduced and ranked in two sets of 10 items to reduce cognitive demands. Children are instructed to rank the items in a pyramid-based structure based on their perceived importance, ranging from ‘very important’ to ‘not at all important’. Scale scores were calculated as the mean of constituent items, ranging from 1.0 to 5.0. The validity and reliability of the measure in the current sample were established in a previous paper (Daniel et al., 2024).

Prosocial Sharing Behavior

We used a resource allocation task to measure prosocial sharing behavior, a paradigm adapted directly from Abramson et al. (2018) to maintain fidelity with a validated measure. This task is a variation of the dictator games frequently used to assess sharing in children (e.g., Benenson et al., 2007; Fehr et al., 2008), where 'cost' is operationalized as forgoing a potential personal gain to benefit another. The use of desirable items such as stickers or candies is standard practice in this paradigm for young children, as they are more tangible and motivating than abstract rewards (Lucas et al., 2008). Children were asked to divide stickers between themselves and an unknown same-sex child presented in a picture. At Time 4, stickers were replaced with marbles as an age-appropriate adaptation due to the declining appeal of stickers with increasing age. Children were presented with two paper sheets, each divided into blue and yellow halves. In each trial, the experimenter placed stickers or marbles on the sheets according to predetermined scenarios. Children were informed the items on the blue half represented their own share, while items on the yellow half represented the share of the other child. In each trial, there was one sheet representing a prosocial option and one sheet representing a selfish option. They were then asked to choose their preferred sheet.

Following each decision, children received the items from the blue half of their chosen sheet, and items from the yellow half were placed in an envelope for the anonymous child.

Table 2 describes the six social dilemmas presented to the children. In four of these dilemmas, choosing the prosocial option resulted in the child losing one sticker. The children's choices (0 = selfish, 1 = prosocial) were summed into a variable called ‘costly sharing,’ representing the number of costly prosocial choices (ranging from 0 to 4). In the other two dilemmas, choosing the prosocial option did not affect the child's stickers. These choices were summed into a variable called ‘non-costly giving’, representing the number of prosocial choices without a cost (ranging from 0 to 2). The number of costly (four) and non-costly (two) dilemmas was kept identical to the original validated protocol.

Figure 1

Schwartz’s (1992) model of universal human values and its representation in the PBVS-C (sample items). Taken from Döring, 2019.

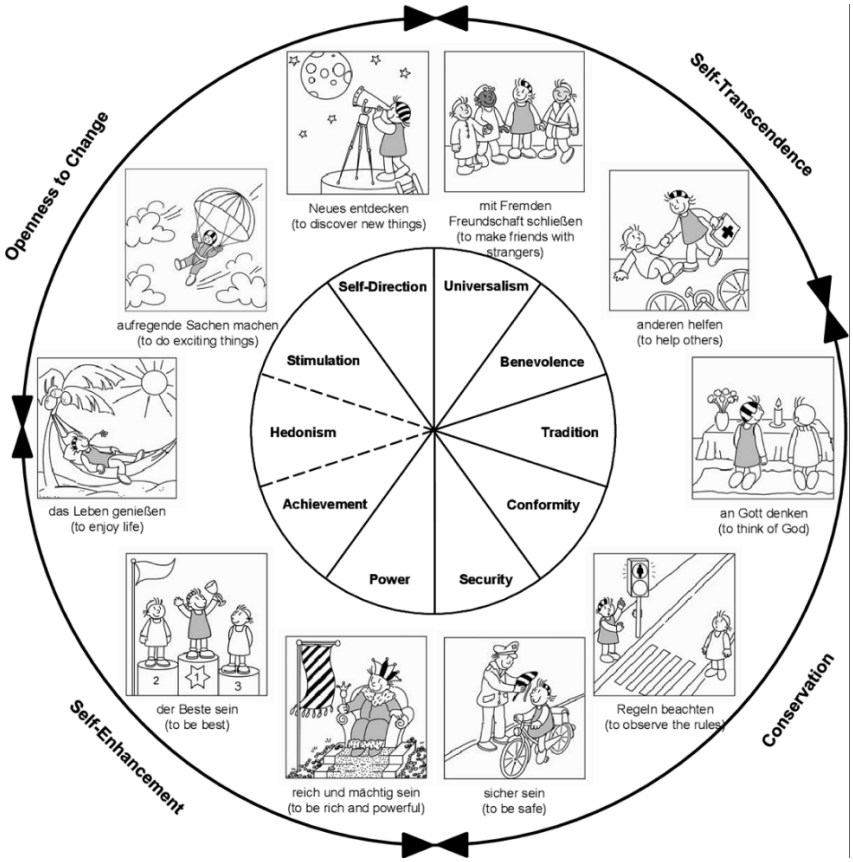


Table 2

Number and Configuration of Stickers or Marbles Presented to Children in Each Social Dilemma in the Sharing Task.

Dilemma type	Prosocial option		Selfish option	
	Self	Other	Self	Other
Costly dilemmas	1	1	2	0
	0	1	1	0
	2	2	3	0
	0	2	1	0
Non-costly dilemmas	1	1	1	0
	0	1	0	0

Procedure

Before the study began, approval was obtained from the ethics committee and the chief scientist at the Israeli Ministry of Education. School administrators received information about the study and were invited to participate. Informed consent forms were then distributed to parents. Children whose parents consented to participation were asked for verbal assent using a child-friendly form. They were interviewed in a private room during school hours and received a pen and stickers or marbles (depending on the child's age) as part of the resource allocation task.

The tasks were administered in a fixed order across all time points as part of a larger testing session. The Picture-Based Value Survey was administered during the first part of the session, while the resource allocation task was administered later. To minimize potential priming effects, the two tasks of interest were separated by a number of unrelated cognitive tasks (four tasks at Times 1 and 2; two tasks at Times 3 and 4). Furthermore, at Times 1 and

2, the testing was often split across two separate sessions, creating a significant temporal separation between the values and prosocial sharing measures.

Analysis plan

Data analysis was conducted using the Mplus Version 8.4 statistical software. Retention rates varied across the measurement points, with missing data ranging from 11.4% at Time 1 to 42.5% at Time 4. Overall, $N = 299$ children participated in the study. To ensure adequate statistical power, we included all children who participated in at least one data collection wave: 1st grade ($N = 265$), 2nd grade ($N = 176$), 3rd grade ($N = 194$), and 4th grade ($N = 172$). We compared the children who were present and missing at the final assessment (T4) and found no significant differences between them in gender, age, values, or prosocial behavior at any time point. Little's MCAR test was non-significant ($\chi 2$ (12) = 0.361, p = .835), suggesting data were missing completely at random. Nevertheless, to maintain methodological rigor and account for any potential bias, we employed a multiple imputation approach, with 30 imputations generated, to address missing data within the subsequent analyses.

We applied a random intercept cross-lagged panel model (RI-CLPM; Hamaker et al., 2015). This model accounts for trait-like and enduring individual differences in constructs. It estimates the stability of constructs over time between the within-individual level of a construct at time t, and the same construct at time t+1. It also estimates the correlations between the two constructs within a time point. Most importantly, it includes the cross-lagged associations, estimating whether each construct at the within-individual level at time t predicts the level of the second construct at time t+1. In this multilevel framework, time points were nested within children, and variance was partitioned into within-child and between-child components. By isolating within-person changes, the model clarifies dynamic

processes within individuals, separating them from stable between-person differences, thus enabling a detailed exploration of the temporal relations between values and behavior.

Model fit was evaluated using the root mean square error of approximation (RMSEA) and the comparative fit index (CFI), with values of RMSEA ≤ 0.08 and CFI ≥ 0.90 suggesting acceptable fit (Hamaker et al., 2015).

We tested alternative versions of the model to determine which one best described the data. We did so by comparing the goodness of fit of the two versions using the Wald test. First, we compared a model in which model parameters indicating continuity and reciprocal associations were constrained to be equal across time points to a model in which all parameters were allowed to vary freely across the four time points. Second, we compared a model in which the cross-lagged association between values and later behavior and the reciprocal associations between behavior and later values were restricted to equality to a model allowing the cross-lagged associations to vary freely between directions.

Results

Descriptive Statistics

Table 3 displays the means and standard deviations for the study variables across the four time points (T1-T4). Over time, prosocial sharing behavior showed significant changes in both conditions (costly sharing and non-costly giving). There was a pronounced non-linear upward trend in the costly condition ($F(3) = 27.52$, $p < .001$, $\eta^2p = 0.46$), with means increasing from 1.38 at T1 to 2.27 at T4. The non-costly condition showed a linear upward trend ($F(3) = 32.87$, $p < .001$, $\eta^2p = 0.51$), with means rising from 0.87 at T1 to 1.60 at T4. Note that the costly condition involved four trials (range 0-4) and the non-costly condition involved two (range 0-2). Proportionally, non-costly giving (which rose from 43.5% of trials at T1 to 80.0% at T4) was consistently more frequent than costly sharing (which rose from 34.5% at T1 to 56.8% at T4). Bivariate associations between values and prosocial sharing

behavior across the four time points, differentiated by condition, are presented in the supplementary material (Section S1and Figure S1).

We conducted supplemental analyses to test for the effects of age and gender as control variables and moderators; these did not alter our primary findings (see Supplemental Section S2, Tables S1 and S2 for a full report).

RI-CLPM Analysis

We used RI-CLPM models to estimate the longitudinal relations between self-transcendence and self-enhancement values and the two conditions (costly sharing, non-costly giving) across the four time points.

Table 3

Means and Standard Deviations of Study Variables Across Time Points

	Time 1	Time 2	Time 3	Time 4
Variable	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*
Self-Transcendence	3.53 (0.62)	3.68 (0.53)	3.70 (0.52)	3.66 (0.52)
Self-Enhancement	2.44 (0.71)	2.28 (0.61)	2.24 (0.57)	2.24 (0.58)
Prosocial Behavior in Costly Condition (range 0-4)	1.38 (1.37)	1.76 (1.27)	2.54 (1.13)	2.27 (1.10)
Prosocial Behavior in Non-Costly Condition (range 0-2)	0.87 (0.71)	1.07 (0.63)	1.45 (0.61)	1.60 (0.51)

Self-Transcendence Values and Prosocial Sharing Behavior

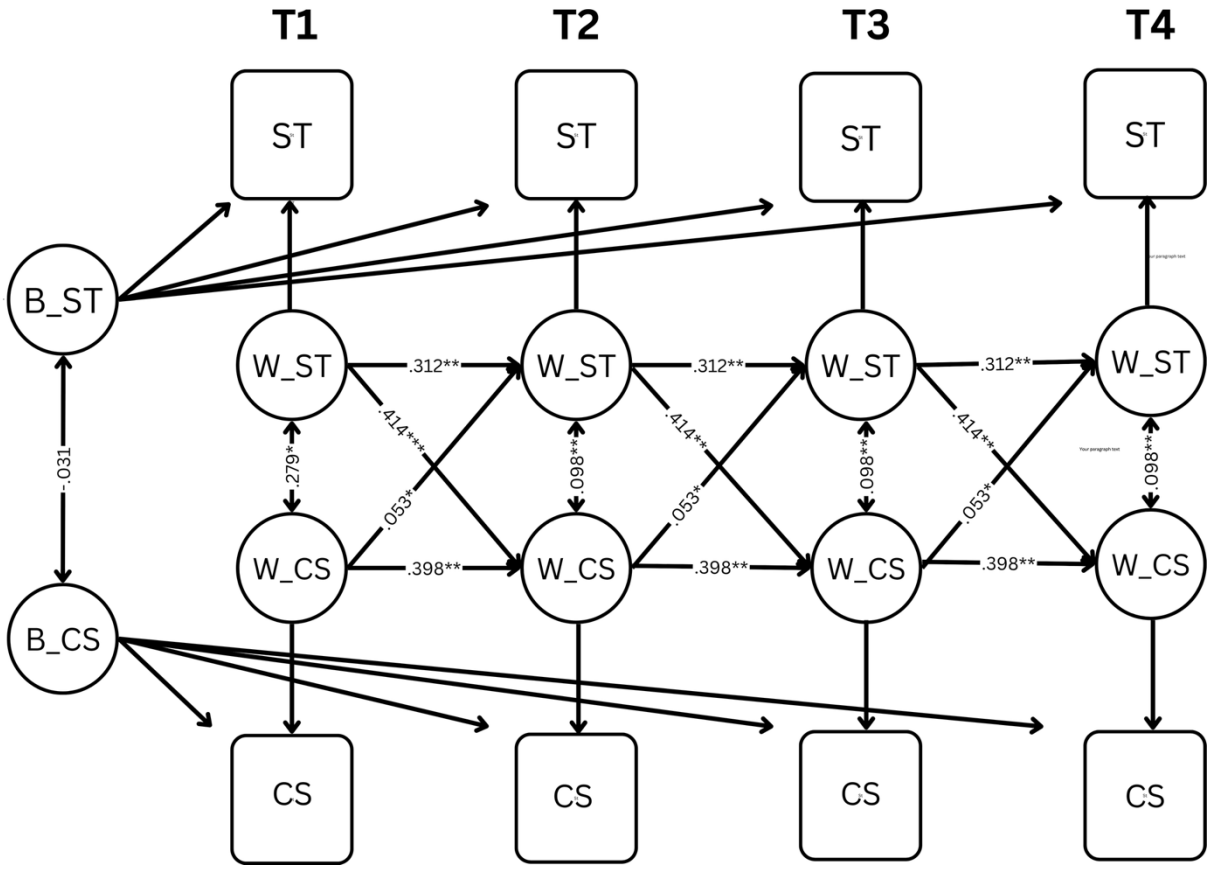
For both costly sharing and non-costly giving, the fixed RI-CLPM model did not show a difference in fit from the free model (costly $W(8) = 14.893$, $p = .061$; non-costly $W(8) = 11.500$, $p = .175$; see Table S3 in the Supplemental Material for full model results). Thus, we present the more parsimonious model here, fixing parameters to equality over time. Figures 2 and 3 depict the relations between the latent variables in the fixed RI-CLPM model for costly sharing and non-costly giving, respectively.

The analysis revealed significant continuity for both self-transcendence values and prosocial sharing behavior across time in both sharing conditions. Importantly, the costly sharing model showed significant cross-lagged associations between self-transcendence values and costly sharing. Specifically, self-transcendence values at time *t* positively associated with costly sharing at time *t*+1 ($r = .414$, $SE = .16$, $z = 2.57$, $p = .010$). Costly sharing at time *t* was also positively associated with self-transcendence values at time *t*+1 ($r = .053$, $SE = .03$, $z = 2.02$, $p = .043$). This suggests a reciprocal relation between self-transcendence values and costly sharing behavior. A restricted model, in which paths in both directions were constrained to equality, showed a significant reduction in fit ($W(1) = 6.15$, $p = .013$), indicating the association between values and subsequent behaviors was stronger than the association between behavior and subsequent values. No significant cross-lagged effects were observed for self-transcendence values and non-costly giving ($p > .775$).

Concurrent relations indicating associations between self-transcendence values and prosocial behavior within a time point were found at the first time point for both costly sharing ($r = .279$, $p = .001$) and non-costly giving ($r = .092$, $p = .008$). At later time points, a significant positive correlation was found only for the costly sharing condition ($r = .098$, $p < .001$).

Figure 2

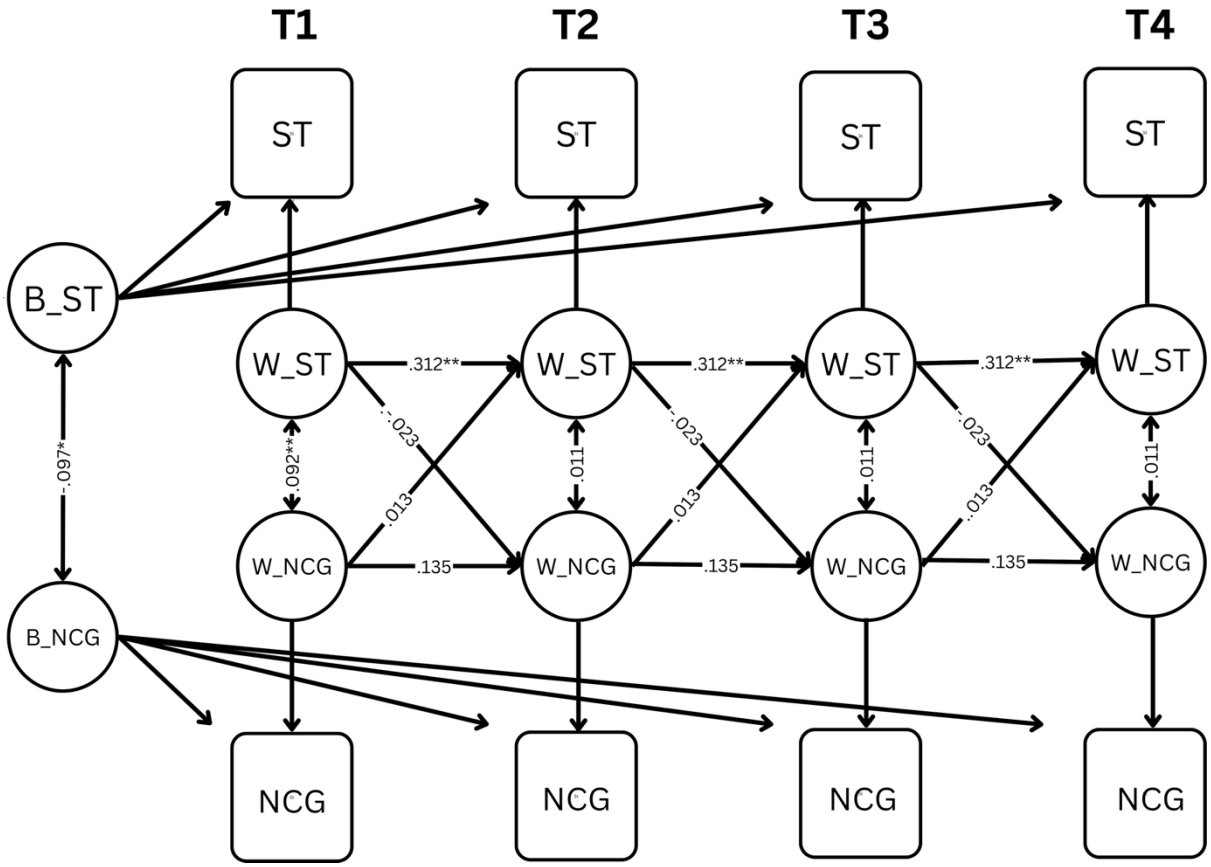
Fixed RI-CLPM Model for Self-Transcendence Values and Costly Sharing Behavior



Note. *p < . 05, **p < .01, ***p < .001; ST = self-transcendence values; CS = costly sharing behavior; B = between individuals; W = within individuals; *CFI* = .91, *RMSEA* = .06.

Figure 3

Fixed RI-CLPM Model for Self-Transcendence Values and Non-Costly Giving Behavior



Note. *p < . 05, **p < .01, ***p < .001; ST = self-transcendence values; NCG = non-costly giving behavior; B = between individuals; W = within individuals; *CFI* = .92, *RMSEA* = .05.

Self-Enhancement Values and Prosocial Sharing Behavior

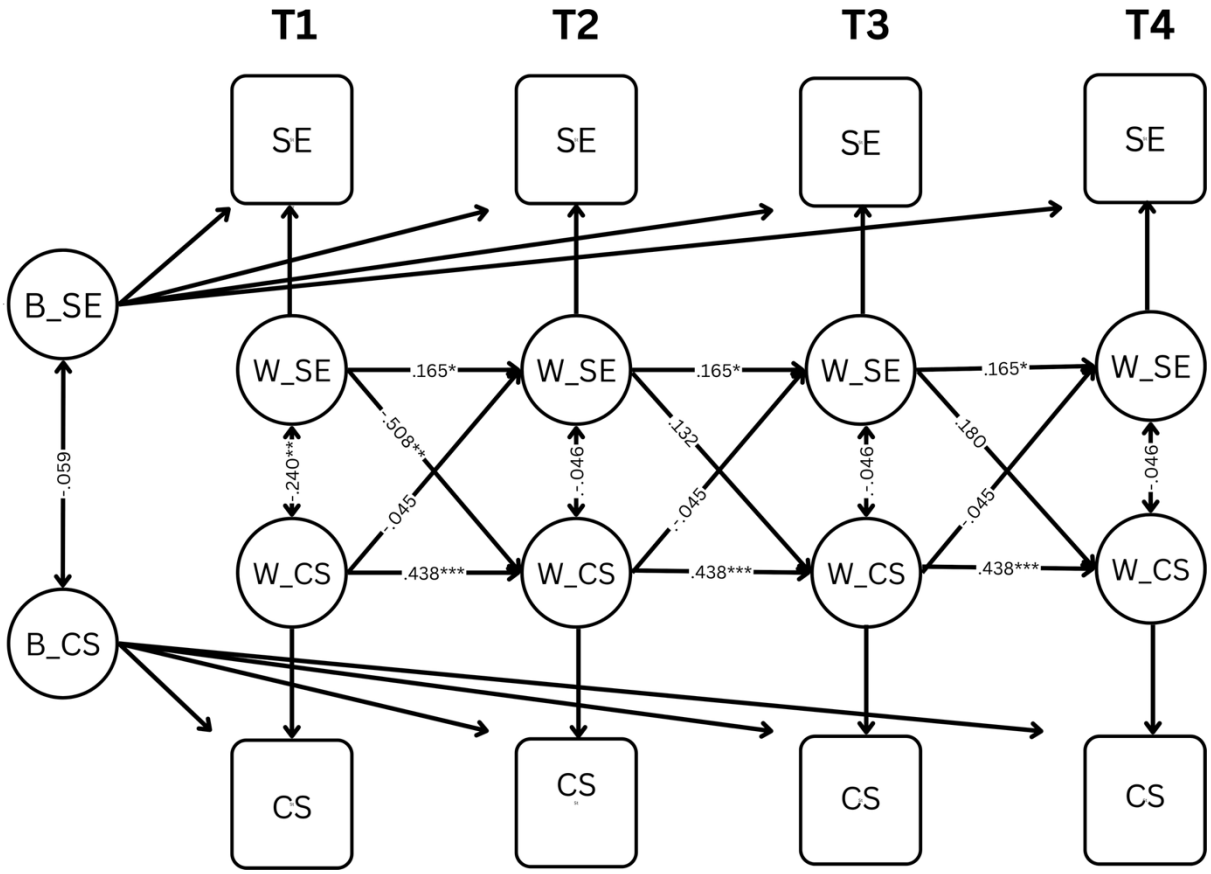
For costly sharing and non-costly giving, the fixed RI-CLPM model showed a difference in fit from the free model ($W(8) = 24.083$, $p = .002$). A partially restricted model indicated only the path between values and later costly sharing behavior differed across time. This model did not differ from the free model in fit ($W(6) = 9.668$, $p = .139$) and is presented here. The fixed model of non-costly giving did not show a difference from the free model ($W(8) = 14.773$, $p = .064$; see Table S4 in the Supplemental Material for full model results).

Thus, we present the more parsimonious model, fixing parameters to equality over time. Figures 4 and 5 depict the relations between the latent variables in the fixed RI-CLPM model for costly sharing and non-costly giving, respectively.

Results showed significant continuity for both self-enhancement values and prosocial sharing behavior across time in both sharing conditions (costly sharing, non-costly giving). However, cross-lagged effects were observed between self-enhancement values and costly sharing behavior only at the first time point. Specifically, the path from self-enhancement values at T1 to costly sharing behavior was negative and significant at T1 (b = -.508, p = .007), but not at any later time (b = .132, p = .558, and b = .180, p = .379). The reverse direction, the path from costly sharing behavior to self-enhancement values, was not significant (b = -.045, p = .225). In the non-costly giving model, neither the path from self-enhancement values to behavior (b = .041, p = .646) nor the path from behavior to self-enhancement values (b = .010, p = .871) reached statistical significance. Similarly, we found significant concurrent relations between self-enhancement values and costly sharing only at T1 (r = -.240, p = .007). Associations at later time points (r = -.046, p = .167) and associations with non-costly giving (r_{t1} = -.045, p = .302; $r_{t2\text{-}4}$ = -.015, p = .439) were not significant.

Figure 4

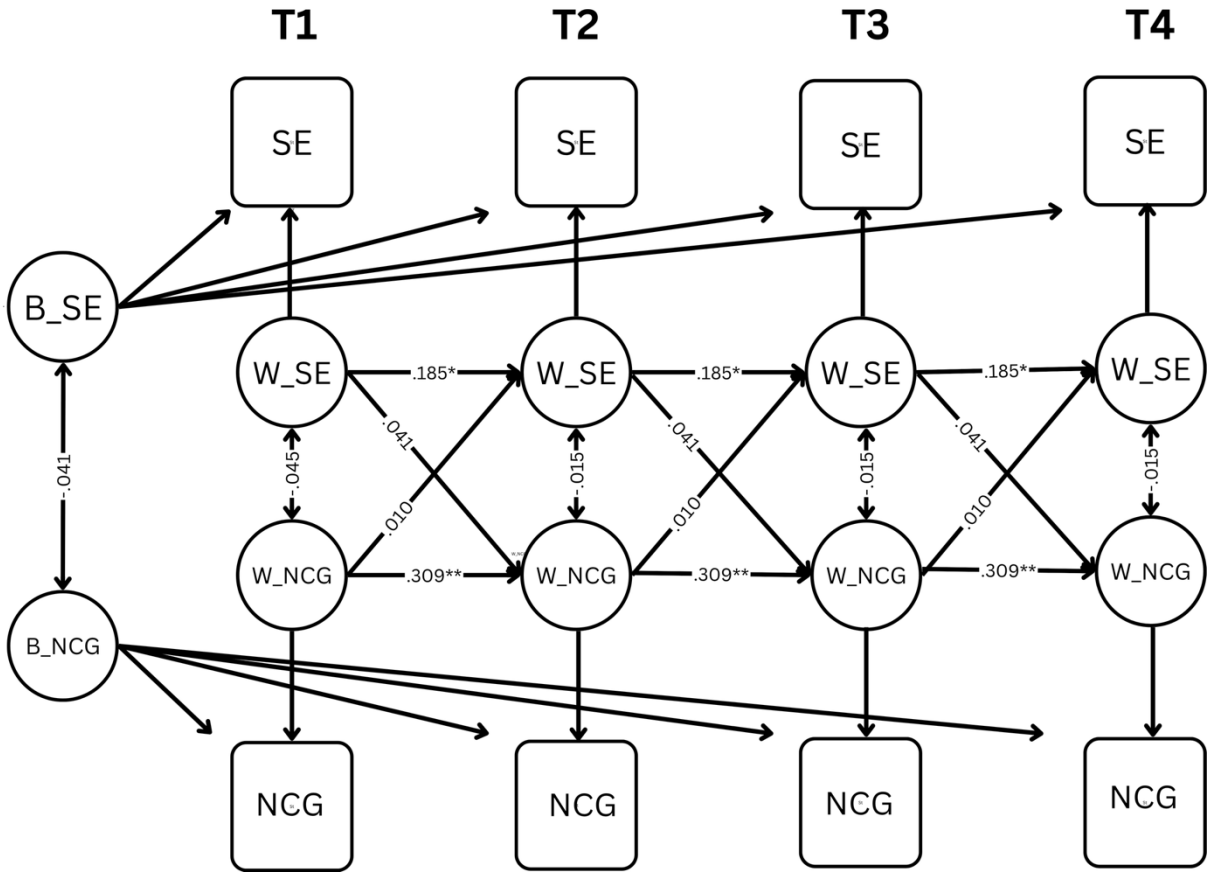
Fixed RI-CLPM Model for Self-Enhancement Values and Costly Sharing Behavior



Note. *p < . 05, **p < .01, ***p < .001; SE = self-enhancement values; CS = costly sharing behavior; B = between individuals; W = within individuals; *CFI* = .97, *RMSEA* = .04.

Figure 5

Fixed RI-CLPM Model for Self-Enhancement Values and Non-Costly Giving Behavior



Note. *p < . 05, **p < .01, ***p < .001; SE = self-enhancement values; NCG = non-costly giving behavior; B = between individuals; W = within individuals; *CFI* = .86, *RMSEA* = .06.

Discussion

We investigated the reciprocal relations between self-transcendence and self-enhancement values and prosocial sharing behavior in middle childhood, using costly sharing and non-costly giving as examples of prosocial behavior. We employed RI-CLPM across four time points to disentangle within-person and between-person effects over time and gain insight into the direction of relations.

Directional Relations Between Values and Behavior

The most salient findings were the relations between self-transcendence values and costly sharing behavior. In line with our hypothesis, the findings confirmed a reciprocal relationship between self-transcendence values and costly sharing. Higher self-transcendence values at one time point were associated with engaging in more costly sharing at the subsequent time point. Similarly, engaging in costly sharing was associated with a subsequent increase in the importance of self-transcendence values. Importantly, a restricted model test suggested that the path from values-to-behavior was significantly stronger than the path from behavior-to-values. We found some isolated negative associations between self-enhancement values and costly sharing behavior at T1.

In line with previous research among adolescents and adults, self-transcendence values were associated with more prosocial behavior (Benish-Weisman et al., 2019; Daniel et al., 2015; Sagiv et al., 2017). We join the small number of studies demonstrating the same association in early childhood and the beginning of middle childhood (Abramson et al., 2018; Benish-Weisman et al., 2019; Daniel et al., 2020; Scholz-Kuhn., 2023). Values appear to be consistently associated with social behavior, not only in adults and adolescents, but also in children as young as six years of age. This finding raises a key theoretical question: Given the conceptual proximity between self-transcendence and prosociality, is the link we found merely circular? We argue it is not, for two main reasons. First, following Schwartz's (2012) theory, values are broad, trans-situational goals, whereas prosocial sharing in our task is a concrete action. Second, as Schwartz (2005) notes, behavior is often guided by trade-offs among competing values. Costly sharing creates a motivational conflict between benefiting another (an expression of self-transcendence) and the immediate self-interest of keeping a desirable resource. Our finding that the priority of self-transcendence values is associated with this behavioral outcome is therefore not tautological; it demonstrates children's

developing capacity to resolve a motivational conflict in line with their abstract value system. We must note, however, that we did not find similar, conflicting relations between prosocial behavior and self-enhancement values. This asymmetry suggests that despite the motivational contradiction between the values, self enhancement and self-transcendence values may focus on different content matters. Self-transcendence values refer specifically to the aspiration to care for others and make them happy. The aspiration for achievement or power does not directly ascribe lack of care for others. Those values may be fulfilled by supporting others, if this support promotes one's interests, for example places them in a leadership position. In other cases, self-enhancement values can be fulfilled by disregarding others' needs to gain favourable status and recognition. In our study, these general and abstract motivations were associated with a very concrete behavior: an instance of sharing resources with an unknown child. Research has indicated an increase in the coherence and stability of the moral self-concept in middle childhood, with children of this age more likely to view themselves as moral across contexts and behaviors (Söldner et al., 2024). Self-transcendence values may be an aspect of the moral self-concept, as they define the extent to which individuals see themselves as trying to do good to others. Increased coherence can allow children to apply these values across multiple concrete contexts and behaviors.

The results suggest there is a stable association between self-transcendence values and prosocial sharing behavior over time. Others have argued values will become stronger motivators of behavior as children mature (Knafo-Noam et al., 2024). Because values become more stable and consistent with age (Daniel et al., 2024; Daniel et al., 2020), children will understand their own values better and use them to make decisions more easily. Ours was the first study to empirically test this theory, and we did not find evidence supporting it. It is possible that the crystallization of values-behavior association occurs at even earlier ages than the ages investigated here. Initial cross-sectional studies show an association between

values and behavior already in early childhood (Elizarov et al., 2024). However, longitudinal studies of values and behaviors in early childhood are required to test this hypothesis. Alternatively, values-behavior associations may develop gradually, across different behaviors. Prosocial behavior takes shape during early childhood, with some aspects solidifying at earlier ages than others (Malti & Dys, 2018; Svetlova et al., 2010). It is possible that values-behavior associations follow a similar developmental gradient, with the association reaching stability in middle childhood.

Another explanation for the lack of increasing strength in value-behavior associations may lie in the non-linear nature of cognitive and social development during middle childhood. While linear models of development would predict steadily increasing coherence between values and behaviors, recent research suggests value development may be non-linear. For example, some studies found the importance of values to follow curvilinear trends (Daniel et al. 2024, Ceiciuch et al., 2016). Similarly, the coherence of the value system followed a non-linear trend during middle childhood (Daniel et al., 2024). As values become less coherent, the relations between values and behavior might temporarily weaken (Daniel et al., 2024). Additionally, the growing influence of peer relationships and social comparison during middle childhood (Giletta et al., 2021; Lam et al., 2014; Simpkins et al., 2024) may introduce competing motivations that temporarily disrupt the values-behavior link. The stability we observed might therefore represent a developmental achievement, maintaining consistency despite these competing influences.

Contrary to our hypothesis, we found very little evidence of a negative association between self-enhancement values and prosocial sharing behavior over time. Bivariate correlations suggested a weak negative association. In addition, we found a cross-lagged association at the first time point, although this association did not extend over the study period. Past studies found negative associations between prosocial behavior and self-

enhancement values (Benish-Weisman et al., 2019; Scholtz-Kuhn, 2023). However, these associations were not consistent, and some studies found null relations (e.g. Danioni & Barni, 2017 among adolescnts; Caprara et al., 2012, among adults). Some have suggested values profiles, rather than specific and isolated values, are associated with behavior (Daniel et al., 2020). For example, individuals who value self-enhancement and conservation values may behave prosocially, as a socially approved path to gain influence and status. In contrast, those who value self-enhancement and openness to change may avoid prosocial behavior as they may prefer to focus on their own desires and needs. We did not test these patterns of association, but they may account for inconsistencies in the associations.

The developmental trajectory of the relations between self-enhancement values and prosocial behavior might explain these findings. While these values are typically negatively associated with prosociality in adolescents and adults (Benish-Weisman et al., 2019), this relationship may still be forming during middle childhood. Children in this developmental period might not yet have fully internalized the potential conflict between self-enhancement and prosociality (Daniel et al., 2024).

Direction of Relations

In our sample, prosocial sharing behavior was associated with self-transcendence values, but to a lesser extent than the reverse association. This finding was somewhat unexpected, and should be replicated in future studies. As prosocial behaviors develop earlier in life than values (Daniel et al., 2024b; Malti & Dys, 2018), we anticipated these behaviors would play a significant role in shaping children's values (Knafo Noam et al., 2024). While our study confirmed a link between behavior on value development, this association was weaker than hypothesized.

This stronger association of values on behavior compared to the reverse relations might be explained by the consolidation of cognitive structures during middle childhood (Del

Giudice, 2014). As children develop more abstract reasoning capabilities, they may increasingly rely on internalized value systems to guide behavior. This reliance does not always require conscious deliberation; values can also function through more automatic, intuitive pathways. For example, in line with theories that highlight intuitive moral systems (Narvaez, 2008), values may function as a 'perceptual lens' that automatically directs a child's attention to value-relevant cues in a situation, such as another's need (Sagiv & Roccas, 2021). Additionally, the heightened self-awareness that emerges during this stage (Harter, 2008) may enable children to more consciously align their behaviors with their values. The weaker association of behavior with values might also reflect the fact that values, once formed, are relatively resistant to change (Bardi & Goodwin, 2011), requiring repeated or emotionally significant behavioral experiences to shift meaningfully.

The bidirectional, yet unbalanced, nature of the association we found between values and behavior mirrors findings from longitudinal research in adolescents demonstrating the reinforcing nature of values and social behaviors (Aquilar et al., 2018; Benish-Weisman, 2015; Vecchione, Döring et al., 2016). The early emergence of this reciprocal relation in middle childhood suggests fostering self-transcendence values in young children can have long-term benefits for prosocial development. Educational interventions that encourage prosocial behavior may therefore contribute to the development of a stable, prosocial disposition over time (Russo et al., 2022).

Values and Motivation: Costly versus Non-Costly Prosociality

We found values were related with costly sharing but not non-costly giving. This finding replicates a previous cross-sectional study (Abramson et al., 2018). Together, the results suggest the association between self-transcendence values and prosocial sharing behavior in middle childhood may be context-dependent, emerging more strongly when personal sacrifice is involved. The personal sacrifice required in costly sharing may require a

stronger motivation than the one required in non-costly giving. Similarly, contextual factors, such as closeness of the recipient, the recipient's need, etc., may determine the likelihood of children behaving prosocially during middle childhood (Malti & Dys, 2018). It appears that during this developmental period, children learn to be discerning in their generosity.

One potential explanation for the differences in sharing behaviors may be the influence of social norms. Children learn both implicit and explicit normative rules by observing and imitating others, and they understand that the same behavior, such as sharing, is subject to different norms depending on the context (Abramson et al., 2018; Rakoczy & Schmidt, 2013). In contexts of non-costly giving, the avoidance of prosociality may be considered selfish and is less acceptable. In these cases, social expectations may overshadow the influence of personal values on behavior (Sagiv & Roccas, 2021), leading to weak associations between self-transcendence values and non-costly giving behavior. However, in contexts of costly sharing, which involve personal sacrifice, it is more acceptable to keep resources to oneself (Grusec et al., 2011). In these cases, the norm will be looser, allowing individuals to behave in line with their values (Sagiv & Roccas, 2021).

This interpretation aligns with House et al.'s (2012) findings that costly sharing shows greater cultural variability than non-costly giving, suggesting stronger normative influences on costly sharing behaviors across diverse contexts. Furthermore, children's increasing sensitivity to fairness norms through middle childhood (Shaw et al., 2016; Wörle & Paulus, 2018) may create a ceiling effect for non-costly giving, as most children comply with the strong social expectation to share when there is no personal cost, regardless of their individual value orientations. The stronger values-behavior link in costly sharing may therefore reflect the greater role of individual decision-making when norms permit multiple socially acceptable choices, allowing for the expression of personal values (Rakoczy & Schmidt, 2013; Sagiv & Roccas, 2021).

Alternatively, the difference in associations may reflect the conflicting motivations inherent in costly sharing dilemmas. In these situations, children face a motivation to benefit others, but also a motivation to prioritize their own self-interest. The self-interest increases when there is a cost to sharing. In these situations, the motivation to benefit others should be substantial to balance the conflict and allow sharing to take place.

Strengths and Limitations

The study advances scientific understanding of the complex relations between values and prosocial behavior in middle childhood. An important strength of this research was its longitudinal design, as it allowed us to measure values and behavior across four years in middle childhood, a pivotal time in values development (Knafo Noam et al., 2024). The design enabled us to investigate stability and change in values and their relations over time. Furthermore, we used the RI-CLPM, a state-of-the-art statistical technique that allowed us to disentangle within-person and between-person effects, providing a nuanced and detailed understanding of how values and behavior interact over time. Moreover, our focus on both costly sharing and non-costly giving permitted a differentiated analysis of prosocial behavior, revealing distinct patterns of association with self-transcendence values.

The study also had several limitations. First, our sample consisted primarily of children from schools with high-medium to high socioeconomic status. This homogeneity limits the generalizability of our findings to more diverse populations. Future research should aim to replicate and extend our findings with samples representing a wider range of socioeconomic backgrounds. In addition, cultures differ in their conceptions of prosocial behavior and the types of prosocial behavior they emphasize (Davidov et al., 2016). It is important to replicate our findings across cultures, as the socialization of prosocial behavior can differ as a function of the sociocultural context.

Second, our use of a resource allocation task assesses only one facet, sharing, of the broader prosocial domain. While behavior in this task is a widely used indicator of prosocial tendencies, future research should therefore examine various types of prosocial behavior, such as comforting and cooperation, using diverse measures to gain a more comprehensive understanding of the values-behavior relation.

Moreover, the resource allocation task may be subject to issues of external validity. Lab games can be artificial and are subject to observation effects (Jackson, 2012). Indeed, research (especially among adults) has debated whether resource-allocation games measure stable altruistic traits or sensitivity to observation and social norms, and they often show only qualitative correspondence with behavior outside of lab contexts (Galizzi & Navarro-Martinez, 2019). Nevertheless, these measures also have the potential to reveal the preferences of participants beyond the capacity of other measures (Pissor et al., 2020). In a test of convergent validity, T4 costly sharing was associated with concurrent helping an experimenter pick up scattered items (r = .24, p = .003), whereas non-costly giving was not (r = .08, p = .291). Nevertheless, future studies should employ more diverse, observational measures of sharing in everyday contexts to confirm these findings.

Third, the current study is correlational, and thus cannot find causal relations between values and behaiovr. Intervention studies that increase the importance of values (e.g., Arieli et al., 2014; Russo-Netzer & Atad, 2024) or prosocial behavior (Gaspar et al., 2024) can address this limitation and add information regarding the direction of relations between the variables.

Fourth, our task was designed as a behavioral measure of sharing, not an intervention intended to evoke value change. Research shows that interventions powerful enough to alter values are typically complex, multi-step processes (e.g., Arieli et al., 2014; Russo-Netzer & Atad, 2024). The brief and anonymous nature of our task is therefore a limitation when

interpreting the weaker path from behavior to values; this question may be better suited for future intervention studies.

Last, the study was conducted during the COVID-19 pandemic. The pandemic accounted for some attrition and also changed the social context of the study between the second and third time points. We accounted for the missing values using multiple imputation, but future research should replicate our work to unveil possible effects of the pandemic. For instance, the widespread shift to remote learning and the reduction in face-to-face peer interactions resulting from social distancing during the pandemic (Kaimara et al., 2022) may have limited the opportunities for children to engage in and learn from prosocial dilemmas in everyday life. Indeed, research from this period suggests that the lack of peer contact had a negative impact on young children's socio-emotional skills (Egan et al., 2021) and altered the contexts in which prosociality could be expressed (van de Groep et al., 2020). Such disruption could slow the development of skills like interpreting social cues, potentially altering the typical developmental trajectory of the values-behavior link we examined.

Conclusion

Our study offers valuable insights into the dynamic relations between values and prosocial behavior in middle childhood. The reciprocal association we found between self-transcendence values and costly sharing behavior underscores the importance of fostering self-transcendence values in young children to promote prosocial development. By understanding the complex interplay between values and behavior, scientists and practitioners can design interventions that target both values and actions to cultivate prosocial tendencies and create a more compassionate and cooperative society.

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Supplemental Material

Supplemental Material Section 1

Bivariate Associations

Figure S1 presents four heatmaps illustrating the correlations between values and prosocial sharing behavior across four time points, differentiating between costly sharing (CS) and non-costly giving (NCG) conditions. Significance levels are indicated by asterisks (* $p<0.05$, ** $p<0.01$, *** $p<0.001$).

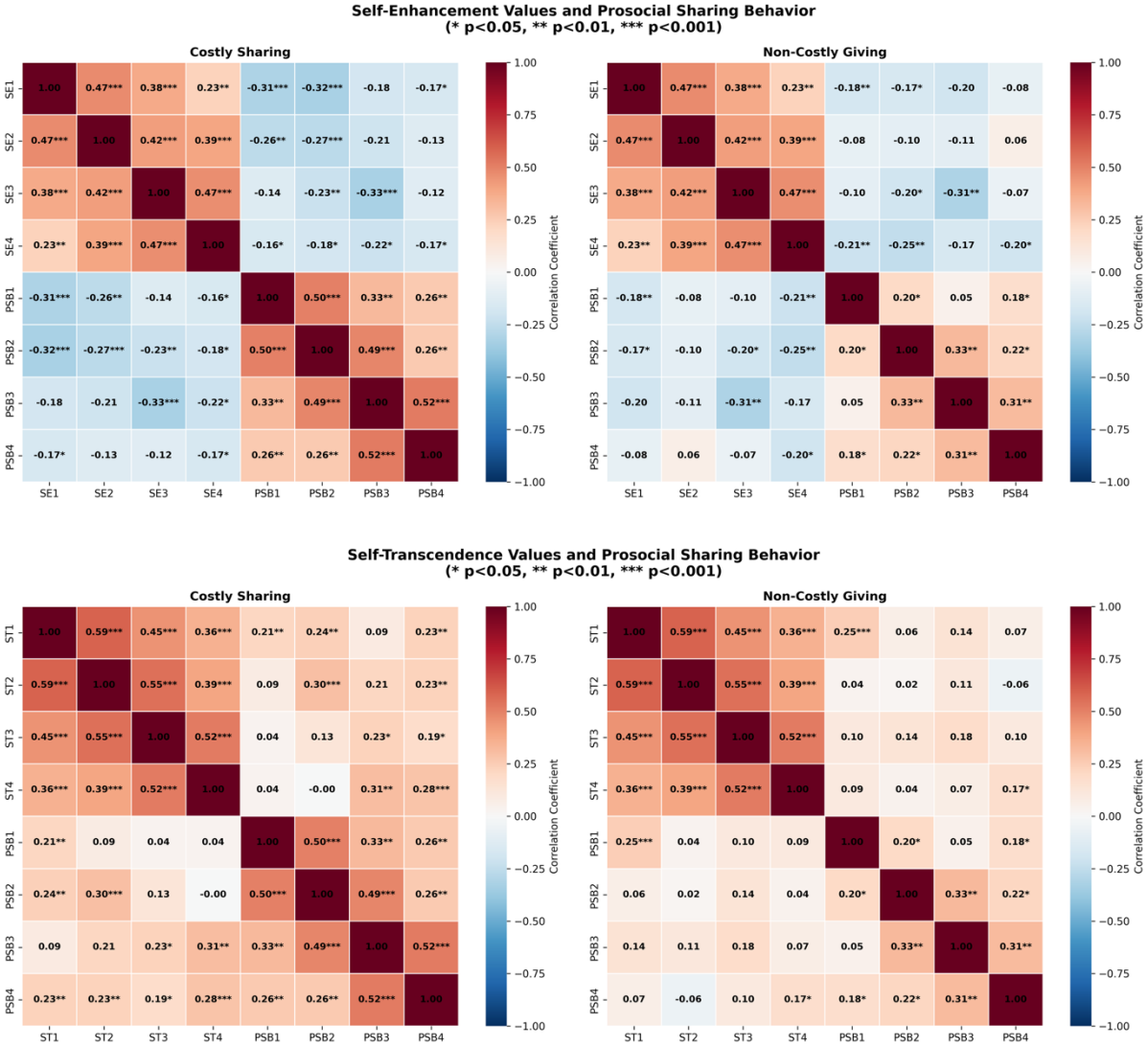
Self-Transcendence Values: The heatmaps reveal strong temporal stability across both CS and NCG contexts, with highly significant correlations between adjacent time points (r = 0.52*** to 0.59***) and moderate to strong correlations for more distant time points (r = 0.36*** to 0.45***). The association between self-transcendence values and prosocial sharing behavior shows a mixed pattern: for costly sharing, significant positive associations are observed primarily at early time points (T1-T2: r = 0.21** to 0.30***), with some significant cross-time associations (e.g., T4 with T1 and T2: r = 0.23**). For non-costly giving, associations are generally weaker, with only the T1 association reaching significance (r = 0.25***) and one cross-time association (T4: r = 0.17*).

Self-Enhancement Values: Self-enhancement values also demonstrate significant temporal stability, with moderate to strong correlations for adjacent time points (r = 0.39*** to 0.47***) and weaker but significant correlations for distant time points (r = 0.23** to 0.38***). In contrast to self-transcendence, consistent negative associations are observed between self-enhancement values and prosocial sharing behavior. For costly sharing, significant negative correlations are evident primarily at early time points (T1-T2: r = -0.26** to -0.32***), with additional significant associations at later time points (T3-T4: r = -0.17* to -0.33***). For non-costly giving, negative associations are somewhat weaker but still significant in several instances (T1: r = -0.17* to -0.18**; T3-T4: r = -0.20* to -0.31**).

Prosocial Sharing Behavior Stability: Both costly and non-costly giving demonstrate strong temporal stability, with particularly robust correlations between adjacent time points (r = 0.49*** to 0.52***) and moderate correlations for more distant time points (r = 0.20* to 0.33**).

Supplemental Material Figure S1

Heatmaps of Correlations Between Study Variables for Costly Sharing and Non-Costly Giving Conditions.



Supplemental Material Section 2

The Roles of Age and Gender

A. Main Effects Analyses

Main effects for gender and age were assessed using t-tests and Pearson correlations, respectively.

Gender: As shown in Table S1, girls consistently scored higher on Self-Transcendence values and boys scored higher on Self-Enhancement values.

Age: As shown in Table S2, age was a significant and positive correlate of costly prosocial behavior at Times 1, 2, and 3.

Supplemental Material Table S1.

Significant Gender Differences in Key Study Variables

Timepoint	Variable	Mean (Boys)	Mean (Girls)	t-statistic(df)	p-value
Time 1	Self-Transcendence	3.46	3.62	-2.08(263)	0.038
Time 1	Self-Enhancement	2.53	2.34	2.23(263)	0.026
Time 2	Self-Transcendence	3.54	3.82	-3.57(174)	<.001
Time 2	Self-Enhancement	2.4	2.18	2.40(174)	0.018
Time 3	Self-Transcendence	3.56	3.84	-3.90(192)	<.001

Time 3	Self-Enhancement	2.33	2.17	2.01(192)	0.045
Time 4	Self-Transcendence	3.56	3.79	-2.96(170)	0.004
Time 4	Self-Enhancement	2.38	2.09	3.32(170)	0.001
Time 4	Costly Sharing	2.13	2.59	-2.83(162)	0.005
Time 4	Prosocial Behavior (All)	3.64	4.18	-2.74(162)	0.007

Supplemental Material Table S2.

Pearson Correlations Between Age and Costly Prosocial Behavior

Timepoint	r	p-value	N
Time 1	0.32	<.001	209
Time 2	0.29	<.001	166
Time 3	0.28	0.017	74

B. Moderation and Control Variable Analyses

To test for moderation, we conducted a series of 42 multiple regression models (testing for interactions between values and demographics on prosocial sharing behavior at each time point) and a multi-group RI-CLPM (testing for moderation of longitudinal paths by gender). These analyses revealed no systematic pattern of moderation. Furthermore, when age and gender were added to the primary RI-CLPMs as control variables, the pattern, magnitude, and significance of the key cross-lagged paths reported in the main manuscript remained unchanged.

Supplemental Material Table S3

Models for self-transcendence and pro-social sharing behavior

	Costly			Non-costly		
	Estimate	Std.Err	z-value	Estimate	Std.Err	z-value
Auto-regressive paths						
Values T1 -> Values T2	0.312**	0.08	3.83	0.312**	0.07	4.12
Values T2 -> Values T3	0.312**	0.08	3.83	0.312**	0.07	4.12
Values T3 -> Values T4	0.312**	0.08	3.83	0.312**	0.07	4.12
Behavior T1 -> Behavior T2	0.398***	0.05	7.55	0.135	0.09	1.56
Behavior T2 -> Behavior T3	0.398***	0.05	7.55	0.135	0.09	1.56
Behavior T3 -> Behavior T4	0.398***	0.05	7.55	0.135	0.09	1.56
Cross-lagged relations						
Values T1 -> Behavior T2				-0.023	0.09	-0.26
Values T2 -> Behavior T3	0.414**	0.16	2.57	-0.023	0.09	-0.26
Values T3 -> Behavior T4	0.414**	0.16	2.57	-0.023	0.09	-0.26
Behavior T1 -> Values T2	0.414**	0.16	2.57	0.013	0.05	0.29
Behavior T2 -> Values T3	0.053*	0.03	2.02	0.013	0.05	0.29
Behavior T3 -> Values T4	0.053*	0.03	2.02	0.013	0.05	0.29
Concurrent relations	0.053*	0.03	2.02			
Values T1 <-> Behavior T1				0.092**	0.03	2.65
Values T2 <-> Behavior T2	0.279*	0.08	3.47	0.011	0.02	0.70
Values T3 <-> Behavior T3	0.098*	0.02	4.05	0.011	0.02	0.70
Values T4 <-> Behavior T4	0.098*	0.02	4.05	0.011	0.02	0.70
	0.098*	0.02	4.05			

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Supplemental Material Table S4

Models for self-enhancement and pro-social sharing behavior

	Costly			Non-costly		
	Estimate	Std.Err	z-value	Estimate	Std.Err	z-value
Auto-regressive paths						
Values T1 -> Values T2	0.167*	0.07	2.26	0.185*	0.08	2.36
Values T2 -> Values T3	0.167*	0.07	2.26	0.185*	0.08	2.36
Values T3 -> Values T4	0.167*	0.07	2.26	0.185*	0.08	2.36
Behavior T1 -> Behavior T2	0.432***	0.04	10.67	0.309**	0.04	7.46
Behavior T2 -> Behavior T3	0.432***	0.04	10.67	0.309**	0.04	7.46
Behavior T3 -> Behavior T4	0.432***	0.04	10.67	0.309**	0.04	7.46
Cross-lagged relations						
Values T1 -> Behavior T2	-0.198	0.15	-1.28	0.041	0.09	0.46
Values T2 -> Behavior T3	-0.198	0.15	-1.28	0.041	0.09	0.46
Values T3 -> Behavior T4	-0.198	0.15	-1.28	0.041	0.09	0.46
Behavior T1 -> Values T2	-0.056	0.04	-1.55	0.010	0.06	0.16
Behavior T2 -> Values T3	-0.056	0.04	-1.55	0.010	0.06	0.16
Behavior T3 -> Values T4	-0.056	0.04	-1.55	0.010	0.06	0.16
Concurrent relations						
Values T1 <-> Behavior T1	-0.275**	0.09	-2.98	-0.045	0.04	-1.03
Values T2 <-> Behavior T2	-0.064	0.03	-1.91	-0.015	0.02	-0.77
Values T3 <-> Behavior T3	-0.064	0.03	-1.91	-0.015	0.02	-0.77
Values T4 <-> Behavior T4	-0.064	0.03	-1.91	-0.015	0.02	-0.77

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$