



I Want More! The Role of Child, Family and Maternal Characteristics on Child Dispositional Greed and Sharing Behavior

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Abstract

Greed is often regarded as a negative trait that impedes prosocial behavior in adults. Yet, relatively little is known about the development of greed and its effects on children. We examine the effect of dispositional greed on sharing behavior in 4-to-6-year-olds. In addition, we identified potential factors associated with child greed, including child, family, and maternal characteristics. This study with 63 mother–child dyads ($Age_{child} = 5.11$, $SD = 0.88$, 50.8% female) revealed that child greed was associated with less prosocial behavior in an observational sharing task. More specifically, children who were reported as greedier by their mothers shared less than less greedy children. Having fewer siblings, less mindful maternal parenting style, and high maternal trait anxiety was associated with higher dispositional greed in children. Additionally, their mother rated greedier children as having higher negative affectivity. These findings suggest that child greed is an important developmental trait that warrants further investigation.

Highlights

- 63 mother–child dyads revealed that child greed was associated with less pro-social behavior in an observational sharing task
- Child greed was associated with higher rates of child negative affectivity.
- Having fewer siblings, less mindful parenting style, high maternal trait anxiety predicted dispositional greed in 4-to-6-year-old children

Keywords Dispositional Greed · Prosocial behavior · Sharing · Childhood · Development

Greed—"a desire to acquire more and the dissatisfaction of never having enough" is often regarded as an antisocial trait (Seuntjes et al., 2015a, p. 518). Widely condemned in most religions (Nath, 1998; Tickle, 2004), greed is related to

selfish behaviors that are often detrimental to others. While prior research suggests that dispositional greed impedes prosocial behavior in adults (e.g., Bao et al., 2020; Mussel et al., 2018; Seuntjes et al., 2015b), little is known about how this trait presents itself in children. Accumulating research has shown that prosocial behaviors (e.g., sharing, helping, and comforting) are associated with beneficial developmental outcomes, such as lower negative affectivity and better physiological regulation in childhood (Eisenberg et al., 1996) and less aggression and emotional problems in adolescence (Memmott-Elison et al., 2020). Hence, greed in young children may be an essential avenue for developmental research on prosocial behavior and emotional problems. By studying greed in childhood, we may be able to prevent the development of antisocial behavior and emotional problems associated with greed. Our research examines the effects of dispositional greed on prosocial behavior and negative emotionality amongst 4 to 6-year-olds and child and family factors associated with its development.

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Child Dispositional Greed

Despite being commonly denigrated in popular media and religious texts, greed may be beneficial (Zeelenberg, & Breugelmans, 2022). From an evolutionary perspective, greed could be advantageous for individuals' survival and reproductive fitness (Axelrod & Hamilton, 1981; Cassill & Watkins, 2005). Greedy individuals are motivated to acquire as much as possible, increasing access to resources, and minimizing the risks associated with scarcity and uncertainty (Rothbart et al., 2001). Thus, greed may have evolved as an adaptive life history strategy to environmental challenges. Indeed, childhood environmental unpredictability is positively associated with greed in university students (Chen, 2018). While previous work has highlighted potential predictors for greed *retrospectively*, our work adds to the evolutionary origins of greed by identifying others factors for its development *during childhood*. Moreover, we examine greed's effects on resource acquisition (i.e., sharing behavior) which underlies its role as an adaptive life history strategy.

Economic theories also allude to greed's advantages, arguing that it is a driver of economic growth and development (Greenfeld, 2001). Since greedy people tend to maximize their outcomes (Lambie & Haugen, 2019), greed is associated with positive economic consequences such as higher employment and wealth (Melleuish, 2009). Greedy adolescents generated more income than their less greedy counterparts (Seuntjens et al., 2016). Similarly, greedy adults (vs. less greedy adults) also earned more as they found the pursuit of wealth more important and valued money more than time (Zeelenberg et al., 2020).

Greed is, however, also associated with adverse consequences in later life, such as bankruptcy (Zandi, 2008) and lower life satisfaction (Seuntjens et al., 2015b; Zeelenberg et al., 2020). For instance, the excessive focus on acquiring more causes greedy individuals to focus on immediate benefits rather than long-term interests, resulting in higher debts (Lunt & Livingstone, 1991). Greed is also positively associated with psychopathy (Vrabel et al., 2019; Sekhar et al., 2020). Given that greed is a universal facet of human life with both positive and negative consequences, it is vital to examine its effects in childhood and its early determinants. Nevertheless, whether dispositional greed is associated with prosocial behavior and negative emotionality in children is still unknown. Investigating this is important since more attention should be paid to prevent the development of greed early in life if the trait risks worse life outcomes.

Child Prosocial Behavior

In general, prosocial behaviors are other-oriented actions where one acts to benefit others (Dovidio et al., 2017). Since greedy individuals possess an insatiable hunger to

acquire more, they are usually self-interested, sometimes at the cost of others (Balot, 2001; Seuntjens et al., 2015a). For instance, greedy people found a variety of ethical transgressions more acceptable and justifiable (Seuntjens et al., 2019). Even when their behavior negatively affected others, greedy people felt that bribes were more desirable, increasing their likelihood of accepting these bribes. While such unethical behaviors were driven by acquisition motivations rather than a desire to hurt others (Seuntjens et al., 2015a), these findings suggest that greedy individuals are less likely to act prosocially.

While a growing body of research highlights the effects of greed on prosocial behavior in adults, more research is warranted to investigate its impact on children. Just like adults, children behave prosocially when they respond to another's needs to benefit others (Dovidio et al., 2017). Given that greed "is often associated and even equated with materialistic desire" (Mussel et al., 2018, p.249), our study focused on sharing behavior – a prosocial action intended to alleviate another's material need (Dunfield et al., 2011). Typically, prosocial behaviors like sharing with others emerge early in life, typically within the first two years (e.g., Brownell et al., 2009; Dunfield et al., 2011). Children as young as 25 months old voluntarily shared valued resources with others when explicit communicative cues about another's needs were present (Brownell et al., 2009). Even infants (18- and 24-month-olds) showed sharing behavior when they understood the concept of ownership (Brownell et al., 2013) and when the other is clearly in need (Dunfield et al., 2011). Nevertheless, since greed and prosocial behavior emerge early in life, it is unlikely that these behaviors are driven by economic principles, of which children are arguably not aware yet. Instead, evolutionary processes may play a more prominent role at an early age.

Moreover, when clear cues of others' needs were absent, most 3 to 4-year-olds behaved selfishly, with only 8.7% of the children willing to share (Fehr et al., 2008). Similarly, 3 to 5-year-olds shared only one piece of food with their peers, keeping ten pieces for themselves (Birch & Billman, 1986). When sharing stickers with an adult, preschool children were less likely to share when it resulted in lesser stickers for themselves than when there were no costs to sharing (Thompson et al., 1997). These findings indicate that sharing is challenging for young children unless situational cues are present (e.g., the experimenter communicating a need). Our research goes beyond cues. Instead, we examine how individual differences would affect such prosocial behaviors. As sharing requires people to overcome the desire to keep all resources for oneself (e.g., Brownell et al., 2009), we hypothesize that greedy children would exhibit less sharing behavior than their less-greedy counterparts.

Child Temperament and Greed

Adult research has shown that greed is associated with several negative personality traits, such as higher negative affectivity, lower emotional stability, higher neuroticism, and lower life satisfaction (Krekels & Pandelaere, 2015; Vrabel et al., 2019). According to these findings, greed seems to be either part of a less well-adjusted personality type (i.e., co-occurring with these traits) or the cause or consequence of such personality traits. However, one study reported that greed was associated with more positive personality traits in adults, such as extraversion (Krekels & Pandelaere, 2015). Yet, another report failed to find such an association (Seuntjens et al., 2015b).

In children, personality is still developing. A precursor of personality traits is the temperament of children, often reported by the parents or teacher (Rothbart et al., 2001). Developmental researchers often study three different temperamental characteristics: negative affectivity, surgency, and effortful control (Gartstein & Rothbart, 2003). Child negative affectivity is comparable to adult negativity and neuroticism, while child surgency corresponds to adult extraversion. Child effortful control is a trait that is not easily comparable to adult personality – it measures impulsivity and inhibitory control, concepts that are more often measured in children than in adults (Gartstein & Rothbart, 2003). In the current study, we focused on child negative affectivity, since this has clear associations with adult negative affectivity. We also report an association between child surgency and effortful control and child greed. To date, it is unclear whether child temperamental characteristics are associated with adult dispositional traits, such as greed, in early childhood. Information on the association between childhood temperament and dispositional greed could give us some clues as to whether these traits develop together or affect each other later in life when greed becomes more recognized as non-social behavior. These findings could inform the development of interventions that target prosocial behavior and greed on the timing of such intervention – if personality traits (i.e., temperament) is already associated with greed in childhood, the intervention could target these temperamental characteristics early on.

Family Factors Associated with Greed

Accumulating research has shown a bidirectional relationship between parenting and children's personality and traits (e.g., Wittig & Rodriguez, 2019). Furthermore, maternal psychological wellbeing early in life also has a major impact on children's outcomes (for a recent review, see Rees et al., 2019). In two recent studies in adolescents,

Liu et al. (2019a, b) found that mindful parenting of the mother was associated with less greed in the adolescents. However, the effect of maternal factors, such as maternal anxiety and maternal (mindful) parenting on dispositional greed in early childhood is still unknown. In this study, we will explore the effect of both on child dispositional greed. Insights into parental factors of greed in childhood could provide potential markers for early interventions. By encouraging mindful parenting and minimizing maternal anxiety, we might prevent the development of negative personality traits.

Research in adults has shown that family factors from childhood, such as childhood resource insecurity is associated with adult greed (Krekels, 2015). Specifically, childhood socioeconomic status (CSES), support systems, and harsh environments were related to greed. Similarly, Chen (2018) revealed that childhood environmental unpredictability was positively associated with greed amongst adults. At the same time, a study by Liu et al., (2019a, b) found in a large sample of Chinese adolescents that childhood SES was positively correlated with dispositional greed amongst only children (the so-called “luxury hypothesis”), but not for adolescents with siblings. Hoyer et al. (2021) replicated the findings of Liu et al. with large American and Dutch adult samples. Together, these results suggest that greed may develop in childhood and that individual differences in greed may be related to the early environment. Yet, the available data stem from adults or adolescents reporting on their childhood. No data directly from children is available to date. Recall bias may skew the results of previous studies, especially in adults reporting back on experiences from over 30–40 years ago, underscoring the need for prospective data from early childhood. In line with the above research, the current study will examine the association between family SES and number of siblings in the household.

The Current Study

In sum, this study investigated (1) the association between dispositional greed and prosocial behavior, (2) the association between dispositional greed and negative affectivity, and (3) explored its potential determinants in 4–6-year-old children. We expected that children whose mothers indicated were greedier would share less with a stuffed animal than less greedy children. Additionally, based on adult studies (Krekels & Pandelaere, 2015; Vrabel et al., 2019), we expect that greedier children are rated as having higher negative affectivity. Moreover, based on previous research in adults (Krekels, 2015; Chen, 2018; Hoyer et al., 2021;

Lui et al., 2019a, b), we explored the following factors associated with child greed: number of siblings, social-economic status (SES), maternal trait anxiety, maternal mindful parenting style, and age of the child.

Method

Participants and Procedure

Sixty-three 4-to-6-year-olds ($M_{age} = 5.11$ years, $SD = 0.88$, 50.8% girls) participated in this study together with their mother ($M_{age} = 35.5$ years, $SD = 4.4$). The present investigation was part of a larger project investigating decision-making, sharing, and regret in children. For this project, mother–child dyads were invited to the lab. Mothers filled out questionnaires regarding their own and their child's behavior and children participated in several behavioral tasks. The full procedure lasted for about 1 h. In the current research, we focussed on the relationship between mother-reported child greed and the child's behavior on the sharing task. Other findings from this study have been presented in Wong et al. (2019).

The study was approved by the Ethical Review Board of Tilburg University, The Netherlands, approval number EC-2015.52. Mothers (and fathers) provided written informed consent for participation of themselves and their child.

Measures

Sharing Task (Child)

We adapted the task from Chernyak and Kushnir (2013) and Paulus and Moore (2014). First, the experimenter introduced the child to a stuffed animal ("Konijn", Dutch for Bunny). The experimenter then took two small trays and gave one of the trays to Konijn and the other to the child. Participants were told that Konijn was a sweet bunny that wanted to be friends with the child and who had five stickers that they wanted to share. Next, the child was given the five stickers and asked to divide these five stickers as they liked by placing them on their respective trays. We used five stickers to force children to create an unequal distribution (i.e., either giving themselves or Konijn more stickers). Based on their allocation, the children were categorized as "high-sharing" (where the majority of the stickers, three or more stickers were given to Konijn) or "low-sharing" (i.e., the majority of the stickers were kept for themselves). Before the experiment started, children were asked to point to their own tray and to Konijn's tray as a final check. See Fig. 1 for a snapshot of this task.



Fig. 1 Snapshot of Sharing Task setup. *Note.* The child was first introduced to a stuffed animal ("Konijn"). Konijn has 5 stickers that he wants to share with the child. Subsequently, the child is asked to share the stickers between him/herself and Konijn. Two small trays were placed in front of the child, one for Konijn and one for the child. Written informed consent was obtained from the parents of the depicted child and from the depicted adult for the publication of this image

Dispositional Greed (Child)

We adapted the 7-item Dispositional Greed Scale (DGS, Seuntjens et al., 2015b) to measure dispositional greed in young children: the Dispositional Greed Scale for Young Children. We rephrased the original items so that mothers could answer these questions about their child (e.g., original: "I always want more", adapted: "My child always wants more"). We adapted some items to fit our context (e.g., original: "One can never have enough money", adapted: "My child always wants the biggest present"). Items were rated on 1 = *completely disagree*, to 5 = *completely agree*. A Principal Component Analysis revealed a unidimensional solution with an Eigenvalue of 3.94, explaining 56.32% of the variance. The scale was reliable, $\alpha = 0.85$. The Dispositional Greed Scale for Young Children can be found in the Appendix in both Dutch and English.

Temperament (Child)

We used the Dutch version of the very short form of the Children's Behavior Questionnaire (CBQ-VSF; Putnam & Rothbart, 2006) to measure the child's temperament. The CBQ-VSF consists of 36 items and looks at three broad dimensions of temperament: surgency/extraversion (e.g., "Seems always in a big hurry to get from one place to another"), negative affectivity (e.g., "Gets quite frustrated when prevented from doing something s/he wants to do"), and effortful control (e.g., "When drawing or coloring in a book, shows strong concentration"). Items were rated on

1 = *completely disagree*, to 5 = *completely agree*. Reliability of the sub-scales was $\alpha_{\text{surgency}} = 0.56$, $\alpha_{\text{negativeaffectivity}} = 0.58$, and $\alpha_{\text{effortfulcontrol}} = 0.76$.

Mindful Parenting Style (Mother)

We used the Dutch version of the Interpersonal Mindfulness in Parenting Scale (IM-P; Bruine de Bruin et al., 2012) to measure parenting style. The IMP consists of 29 items about mindful parenting, such as "I find myself listening to my child with one ear because I am busy doing or thinking about something else at the same time" and "I notice how changes in my child's mood affect my mood". Items were rated on 1 = *never true* to 5 = *always true*. We used the overall subscale based on our previous research (Wong et al., 2019) we used the overall subscale ($\alpha = 0.85$).

Trait Anxiety (Mother)

We used 20 items of the trait anxiety subscale (e.g., "I feel nervous") of the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983). Items were rated on 1 = *almost never* to 4 = *almost always*. The scale was reliable, $\alpha = 0.81$.

Demographic Information

We also asked for age and sex of the child, and the number of siblings. The socioeconomic status (SES) of the family was measured as the financial situation of the family, which was assessed with three items that were averaged: "In the past year, did you have problems at the end of the month paying your fixed costs (for example, rent, groceries, and utilities)?", "In the past year, did you worry about your financial situation?", and "In the past year, did you have to borrow money from friends or family?". Questions were rated on 1 = *never*, to 3 = *always*.

Statistical Approach

Before our main analyses, we checked our data in SPSS (version 24) for outliers with the Explore function (± 3 SDs from the mean) and normality was tested with the Shapiro–Wilk test. Additionally, we checked the assumptions for multiple regression, including multicollinearity with VIF values (should be close to 1).

Then, we ran a binary logistic regression to test whether greed predicted sharing behavior in children with sharing behavior as a binary variable (high-sharing versus low-sharing; aim 1). We subsequently checked whether the effect remained significant when controlling for demographic variables (age, sex, number of siblings, financial situation) by

adding these variables to the model. Next, we ran a multiple regression to test whether child greed predicted child temperament (aim 2), with a focus on negative affectivity, when controlling for above mentioned demographic variables. Finally, we ran Pearson's correlations between all variables (aim 3): dispositional greed, sharing behavior (how many stickers were shared), mindful parenting of the mother, maternal trait anxiety, family size, financial problems (SES), age and sex of the child. Whenever correlation patterns indicated a significant associations, effects were controlled for the above mentioned covariates by running multiple regression models. All analyses were performed with SPSS version 24.

As determined with G*Power (Faul et al., 2007), we have a power of > 0.86 to detect medium effects ($f^2 = 0.15$) in a multiple regression analysis with 6 or less predictors, given a sample size of $N = 63$. However, we lack the power to detect smaller effects ($f^2 = 0.10$) with a multiple regression analysis (< 0.69) in our sample. A total of 9 multiple regression models were run. Effect sizes of the multiple regression are reported both in explained variance (R^2) and in f^2 .

Results

Descriptive Statistics

See Table 1 for a summary of all descriptive statistics, correlations, and reliability coefficients. The size of the families varied, with 6 children (9.5%) that were only child. Majority of the children having one sibling (63.5%). The largest family had 5 children in total. All mothers were partnered and were on average highly educated (56.9% completed higher vocational training and 27.6% a university degree). Additionally, we checked child dispositional greed for outliers and normality. No extreme values were detected (more than ± 3 SDs from the mean) and the Shapiro–Wilk test for normality showed no significant deviations from normality. Finally, all VIF values were close to 1, indicating no issues with multicollinearity.

Dispositional Greed and Sharing Behavior

As most children gave two or three stickers with the stuffed animal (only one child gave one sticker, none of the children gave four or more stickers), we computed a binary variable for sharing. Children that shared less than half their stickers were coded as 'low-sharing' (60.3%), children who shared three or more stickers were coded as 'high-sharing' (39.7%). A binary logistic regression was conducted to examine whether greed scores (DV) could predict whether a child was in the low-sharing or high-sharing group (IV). The greed scores were found to be a significant contributor to the

Table 1 Means, Standard Deviations, Correlations, and Reliability Coefficients of the Multi-Item Scales on the Diagonal (in Italics)

Measures	1	2	3	4	5	6	7	8	9	10	11
1. Greed	<i>.85</i>										
2. Sharing	<i>-.35**</i>	<i>–</i>									
3. Surgency/Extraversion	<i>.16</i>	<i>-.11</i>	<i>.56</i>								
4. Negative affectivity	<i>.37**</i>	<i>-.17</i>	<i>-.15</i>	<i>.58</i>							
5. Effortful control	<i>-.22†</i>	<i>.07</i>	<i>-.11</i>	<i>.01</i>	<i>.76</i>						
6. Mindful parenting	<i>-.42***</i>	<i>.34**</i>	<i>-.13</i>	<i>-.17</i>	<i>.27*</i>	<i>.83</i>					
7. Maternal anxiety	<i>.32*</i>	<i>-.24†</i>	<i>-.12</i>	<i>.18</i>	<i>-.15</i>	<i>-.38**</i>	<i>.81</i>				
8. Family size	<i>-.25*</i>	<i>.24†</i>	<i>-.14</i>	<i>-.20</i>	<i>-.05</i>	<i>.00</i>	<i>.04</i>	<i>–</i>			
9. Financial problems	<i>.20†</i>	<i>-.05</i>	<i>-.01</i>	<i>.11</i>	<i>-.05</i>	<i>-.10</i>	<i>.13</i>	<i>.10</i>	<i>.41</i>		
10. Child Age	<i>.08</i>	<i>.20</i>	<i>.07</i>	<i>-.06</i>	<i>.17</i>	<i>.09</i>	<i>-.16</i>	<i>.20</i>	<i>-.03</i>	<i>–</i>	
11. Sex (0 = girls; 1 = boys)	<i>.18</i>	<i>.05</i>	<i>-.16</i>	<i>.11</i>	<i>-.08</i>	<i>.03</i>	<i>.17</i>	<i>.26*</i>	<i>-.05</i>	<i>.11</i>	<i>–</i>
<i>M</i>	<i>1.99</i>	<i>2.38</i>	<i>4.33</i>	<i>3.48</i>	<i>5.28</i>	<i>3.80</i>	<i>1.53</i>	<i>1.25</i>	<i>0.17</i>	<i>5.11</i>	<i>0.49</i>
<i>SD</i>	<i>0.65</i>	<i>0.52</i>	<i>0.66</i>	<i>0.70</i>	<i>0.78</i>	<i>0.32</i>	<i>0.27</i>	<i>0.76</i>	<i>0.25</i>	<i>0.88</i>	<i>0.50</i>

† $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

model, $\chi^2(1) = 7.506$, $p = 0.006$ (full model). The unstandardized regression weight for greed was: $B_{greed} = -0.180$, $SE = 0.073$, $Wald = 6.19$, $p = 0.013$, indicating that greedy children were less likely to share than less greedy children. The effect of greed remained significant when we controlled for demographic variables (child age, child sex, number of siblings, financial situation), $B_{greed} = -0.194$, $SE = 0.086$, $Wald = 5.11$, $p = 0.023$. The final model explained 28.1% of the variance (Nagelkerke R^2), corresponding to a large effect size ($f^2 = 0.39$). See Table 2 for an overview of the final regression model including covariates.

Child Characteristics and Dispositional Greed

Regarding temperament, the analyses reveal that there was no association between greed and surgency ($r = 0.16$, $p = 0.201$), a significant association between greed and negative affectivity ($r = 0.37$, $p = 0.003$), and a marginally significant association between greed and effortful control ($r = -0.22$, $p = 0.081$). Thus, as predicted, greedier children tended to be less able to self-regulate and to experience more negative emotions. The effects remained similar when controlling for demographic variables (child age, child sex, number of siblings, financial situation) in a multiple regression model (negative affectivity: F (full model) = 3.724; $df = 5$, $p = 0.006$ with $B = 2.18$, $t = 2.72$, $p = 0.009$; effortful control: F (full model) = 2.810; $df = 5$, $p = 0.025$ with $B = -1.46$, $t = -1.88$, $p = 0.066$). The model with negative affectivity explained 26% of the variance in **child dispositional greed**, corresponding to a large effect size ($f^2 = 0.35$). There were no significant correlations between greed and child age ($r = 0.08$, $p = 0.514$) or greed and child sex ($r = 0.18$, $p = 0.158$). See Tables S1 and S2 for an overview of the final regression models for child negative affectivity and effortful control, including covariates.

Family Characteristics and Dispositional Greed

We found that children with more siblings were less greedy ($r = -0.25$, $p = 0.045$). There was no significant correlation between financial problems reported by the mother and child dispositional greed ($r = 0.20$, $p = 0.125$). The association between number of siblings and child greed remain significant when controlling for age and sex ($B = -2.04$, $t = -2.64$, $p = 0.011$). The full model was (marginally) significant, $F = 2.508$; $df = 4$, $p = 0.053$, and explained 15.9% of variance in greed, corresponding to a medium effect size ($f^2 = 0.19$). See Table S3 for an overview of the final regression model including covariates.

Maternal Characteristics and Dispositional Greed

Mothers with a less mindful parenting style had greedier children ($r = -0.42$, $p < 0.001$). We also found that mothers that reported more anxiety symptoms had children with higher dispositional greediness ($r = 0.31$, $p = 0.011$). The significant association between maternal mindfulness and child greed remained significant after controlling for

Table 2 Final (logistic) Regression Model Predicting Sharing by the child

Variables in model	<i>B</i>	Beta	Wald	<i>p</i> -value	Exp(<i>B</i>)
Child greed	-0.194	0.086	5.113	.024	0.823
Child sex (0 = girls)	0.464	0.675	0.473	.492	1.591
Age of child	0.370	0.374	0.978	.323	1.448
Number of siblings	0.349	0.430	0.657	.418	1.417
Education level of mother	0.774	0.508	2.321	.128	2.169

Non-sharing group is the reference

Note: Bold entries indicate $p < .05$

demographic variables (child age, child sex, number of siblings, financial situation) in a multiple regression model ($B = -0.20$, $t = -2.96$, $p < 0.001$). The full model of maternal mindfulness was significant, $F = 6.642$; $df = 5$, $p < 0.001$, and explained almost 40% (39.4%) of the variance in **child dispositional greed**, corresponding to a large effect size ($f^2 = 0.65$).

However, the association between maternal trait anxiety and child dispositional greed became insignificant ($B = 0.25$, $t = 1.915$, $p = 0.061$). Still, the full model of maternal trait anxiety was significant, $F = 2.841$; $df = 5$, $p = 0.024$, and explained more than 20% (21.5%) of the variance in **child dispositional greed**, corresponding to a large effect size ($f^2 = 0.27$). See Table S5 for an overview of the final regression model, including covariates.

Discussion

The current study examined the effect of dispositional greed on sharing behavior in a sample of 63 4-to-6-year-olds. The core finding is that children that were rated as greedier by their mothers, showed less sharing behavior in a behavioral experiment. Additionally, higher greed in children was associated with higher scores on negative affectivity, indicating that greedier children more often experience negative emotions. Finally, this study identified potential determinants of child greed, namely, having a less mindful, anxious mother,¹ and living in a household with less siblings. Taken together, these findings suggest that child greed is an important developmental construct that may have implications for later prosocial behavior and mental health.

To the best of our knowledge, this is the first investigation into the development of greed in childhood, and our findings make several contributions. While prior research has developed several individual differences measures for adults (Zeelenberg et al., 2022), the current study adapted the Dispositional Greed Scale (Seuntjens et al., 2015b) to measure child greed. This scale was reliable and we replicated a variety of associations between greed and other constructs that were previously only found in adults. Specifically, we found that dispositional greed reduces the likelihood of sharing behavior in children. Thus, while extant research has established the link between greed and prosocial behavior among adults, we found similar effects emerge in 4-to-6-year-olds. This finding could have implications for early interventions focusing on improving prosocial behavior in children, suggesting that these interventions could consider targeting child dispositional greed as well.

Next, we examined the relationship between dispositional greed and the child's negative affectivity and other temperamental characteristics. As expected, we found an association between greed and negative affectivity in young children. Greedy children experienced more negative affect than less greedy children did. This is in line with previous findings in adults. Greedy adults scored higher on negative affectivity, lower on emotional stability, higher on neuroticism, and lower life satisfaction (e.g., Krekels & Pandelaere, 2015; Vrabel et al., 2019). Not surprisingly, the desire to always want more and never being satisfied is associated with more negative feelings. In terms of other temperamental characteristics, we did not find a correlation between greed and surgency/extraversion, similar to Seuntjens et al. (2015b). However, our results are inconsistent with Krekels and Pandelaere (2015) who found that greedy adults were more extraverted (higher surgency).

Furthermore, our findings also corroborate previous research speculating that the disposition to be greedy develops during childhood. Consistent with Chen (2018) who found an association between childhood insecure attachment and greedy disposition in adults, we found that children from less anxious mothers with a more mindful parenting style were less greedy. Previous research has found that mindfulness was associated with more healthy attachment, whereas maternal anxiety is associated with less healthy attachment (Snyder et al., 2012; Walsh et al., 2009). In turn, experimental research has shown that positive parenting, including secure attachment, is associated with more prosocial decisions making in children (Bakermans-Kranenburg & van Ijzendoorn, 2011; Knafo et al., 2011). Importantly, in our previous work on the same sample (Wong et al., 2019), we did find that children from mothers that scored higher on mindful parenting showed more prosocial behavior (i.e., shared more). Taken together, we purport that children from more mindful and less anxious mothers are less greedy and more prosocial.

In addition, our findings suggest that family size was related to greed and sharing behavior. Children from families with more children scored lower on greed and were (marginally) more likely to share with the stuffed animal. We replicate previous findings that show that children with siblings tend to be more prosocial than children with less or no siblings (Van Lange et al., 1997). It could be that children with siblings are more used to sharing their toys and other resources (with their siblings), whereas children without siblings do not have to compete for toys and other resources. Since most skills and traits develop in the context of experiences (experience-based learning, e.g., Mustard, 2006), only children may therefore have less experience with sharing and, in turn, become less inclined to share and become greedier.

¹ In our study only mother–child dyads participated. We have no reason to believe that these results would be different in cases where the father would be the primary care-taker.

Nonetheless, our findings also open new avenues for research. Research on the association between childhood social-economic status and dispositional greed appears equivocal. While some studies associated harsh childhood environments, such as low socioeconomic status and insecure attachment to greed in adults and adolescents (e.g., Chen, 2018; Krekels, 2015), others found higher living standards to be associated with adolescent greed (Hoyer et al., 2021; Liu et al., 2019a, b). We contribute to these inconclusive findings, by not finding a relationship between greed and financial problems. Nevertheless, the small number of mothers experiencing financial difficulty in our sample and our modest sample size in general could have lowered our power to detect any effects. Thus, further research examining the effects of childhood SES and greed across diverse backgrounds is warranted.

Moreover, it would be interesting to further investigate the relationship between greed and prosocial behavior. We found that greedy children were less likely to share with the bunny in the sharing task. In the future, it would be interesting to extend this research and investigate how greed is associated with prosocial behavior towards their peers instead of a plush animal. We also consider it interesting to investigate how greed affects children's relationship with their peers, and if, for example, greedy children have more difficulty sustaining friendships.

In addition, future research could investigate what causes greedy inclinations at an early age. From an evolutionary perspective, greed is often seen as a coping mechanism for self-preservation in situations of scarcity and uncertainty (Cassill & Watkins, 2005). Indeed, studies by Chen (2018) and Krekels (2015) indicate that people who grew up with more childhood uncertainty and instability are greedier as adults. However, only adult participants were investigated in a retrospective study in these studies. Moreover, twin studies have shown that prosocial behavior is hard-wired into genes, indicating that a large proportion of variance (between 30–50%) in prosocial behavior can be explained by genes (Knafo et al., 2011). To provide conclusive evidence on the development of greed and its determinants (including genetics), a large longitudinal (twin) study with children from different socioeconomic backgrounds should be leveraged.

Finally, the association between child greed and negative affectivity warrants further investigation. This is especially vital since negative affectivity is a predictor for poor mental health in later life (Kozlova et al., 2019; Sayal et al., 2014). Longitudinal designs could examine the causality of this relation; do greedy children develop more negative emotions because they are greedy, or vice versa? Building on research in adults, it seems likely that greedy children become less prosocial adults with more negative affectivity, putting them at risk for loneliness,

social exclusion, and mood disorders. Our research shows that (mindful) parenting could be a potential intervention preventing negative affectivity and promoting prosocial behavior. However, more (longitudinal) research into child greed is necessary before successful interventions can be developed.

Our study has several limitations. First of all, our relatively small, homogeneous sample decreases the generalizability and power of our study. Post hoc power analyses showed that we do have enough power to detect medium and large effects. However, our sample size is too small to detect small effects. This is also observable in our results – only effects with large and medium effect sizes were found. It could therefore be that genuine, small effect were missed in our study. Additionally, since most of our families are financially healthy, it is impossible to make implications about poverty/low SES and greedy behavior in children in our study. Future research should therefore replicate our study in a larger, more diverse sample. Secondly, the cross-sectional design of our study makes it impossible to make inferences on causality. It is unclear from our study, for instance, whether family characteristics are *causing* greedy behaviors in children. Finally, several limitations are related to the questionnaires that were used in our study. The temperament subscales suffered from low reliability and our child dispositional greed scale is not yet validated. Additionally, all concepts were reported by the mother, which can introduce reporter bias. Mothers may project their own characteristics or feelings, such as anxiety/depression, onto their child's behavior and feelings (Maoz et al., 2014). Nevertheless, the correlation between maternal trait anxiety and mother-reported child negative affectivity was low in our study. Still, observations of child temperament and/or a standardized experiment to test greed would therefore be a good addition for future research.

Conclusion

Here, we investigated the association between child greed and sharing behavior in 4-to-6-year-olds and child greed and negative affectivity. Previous research in adults found that greedy individuals are less prosocial and share less with others. We found a similar pattern—greedy children shared less in an observational sharing game. Moreover, similar to adult research, we found that greedy children showed more negative affectivity. Exploratory analyses also showed that higher dispositional greed was associated with having fewer siblings, less mindful parenting style of the mother, and higher maternal trait anxiety. Child greed seems to be a crucial developmental trait with potential clinical applications warranting further investigation.

Data availability statement

The dataset generated and analyzed during the current study is not publicly available due privacy constraints (of the participants), but are available from the corresponding author on reasonable request. The questionnaire developed for this study is available in Dutch and English in our Supplemental files.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-022-03348-9>.

Declarations

Conflict of interest The authors have nothing to declare.

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