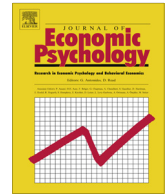




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## Greed and adolescent financial behavior

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## ABSTRACT

Financial problems in adolescents have increased over the last decades. We investigated if individual differences in greed relate to financial behavior. Greed is an important motive for economic behavior and refers to the tendency to never be satisfied and to always want more. We developed a short version of the Dispositional Greed Scale (Seuntjens, Zeelenberg, Van de Ven, & Breugelmans, 2015), which we then used in a large survey with adolescents ( $N = 3899$ ). Dispositional greed is associated with them having more income, spending more, saving less often, and having debt more often. Identifying what personality characteristics influence financial behavior at a young age is important, as the financial habits that people learn during adolescence persist in adulthood. We find that greed has both positive effects (having a higher income), but also negative effects with the greedy being less likely to save and being more likely to have a debt.

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## 1. Introduction

Financial problems in adolescents and young adults are common in Western countries. It has been argued that these problems have increased substantially over the last decades (Dwyer, McCloud, & Hodson, 2011; Hovee et al., 2014). For example, credit card debt among young American adults increased with 104% in the period of 1992–2001 (Draut & Silva, 2004); 27% of the Dutch adolescents have debts other than study debts (Nibud, 2015); 32% of young Europeans indicate they have trouble making ends meet (Intrum Justitia, 2014); and 39% of Dutch high school students indicate that they are sometimes or often short of money (Nibud, 2014). This development is worrisome, as previous research has found an association between being in problematic debt and the existence of mental problems and withdrawal of social interaction (Jenkins et al., 2008). In addition, financial problems are associated with lower academic performance (Scott, Lewis, & Lea, 2001). Arguably, engaging in social contact and academic performance are most important early in one's career and setbacks in those domains in adolescence are likely to have long term effects on personal development and employability.

Although demographic and standard economic variables explain a substantial amount of variance in financial problems, more factors account for differences in financial troubles (Lea, Webley, & Levine, 1993). Other research confirms these findings, factors such as financial attitudes and skills are good predictors for financial problems (Nibud, 2012). Research also suggests that some people are better in handling their financial situation than others. For example, students who are bad at delaying gratification are more likely to have credit card debts (Norvilitis & Merwin, 2006), people with self-control

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problems take greater financial risks and have more income shocks and unforeseen expenses (Gathergood, 2012), impulsive people have more expensive consumer credits and other types of debts (Gathergood & Weber, 2014; Nibud, 2015), and emotional stability, introversion, materialism, and the need for arousal are all positively associated with more credit card misuse (Pirog & Roberts, 2007; Watson, 2003). More recently, Xu, Beller, Roberts, and Brown (2015) found that conscientiousness and neuroticism are associated with more financial distress in young adults. There are thus quite some psychological processes that play an important role in financial behavior. In the current research we aim to contribute to the understanding of psychological factors in financial behavior. Specifically, we focus on the psychology of greed. We investigate if individual differences in greed are predictive of financial behavior in adolescents.

### 1.1. Greed

Greed is an important topic. Early scholars such as the Greek antiquity already wrote about greed, and also today greed is often discussed and debated (Robertson, 2001). Although greed is a popular topic and much is written about its causes and consequences, there is little empirical research actually investigating greed. Only in the last five years researchers have started to gain more interest in this topic and investigate what greed is and what greed does. This is visible from recent publications in various fields related to economic psychology, such as management (Gilliland & Anderson, 2011, 2014; Haynes, Campbell, & Hitt, 2014; Haynes, Hitt, & Campbell, 2015; Wang, Malhotra, & Murnighan, 2011; Wang & Murnighan, 2011), marketing (Krekels, 2015), and neuroscience (Mussel, Reiter, Osinsky, & Hewig, 2015).

One reason for the neglect of greed in empirical research is that there was no consensus on how to define greed (Wang & Murnighan, 2011). In order to deal with this problem, a prototype analysis was conducted to gain more insight into how people define greed (Seuntjens, Zeelenberg, Breugelmans, & Van de Ven, 2015). Prototype analysis uses laypeople's conceptualizations of a construct to get a better idea of how to define and thus use that construct. The prototype analysis of greed revealed that greed is best defined as the "experience of desiring to acquire more and the dissatisfaction of never having enough" (p. 518), which thus is an insatiable desire for more of something.

This prototype analysis also found that people often associate greed with related constructs, such as maximization, materialism, and self-interest (Seuntjens, Zeelenberg, Breugelmans, et al., 2015). However, theoretically one can argue that they are distinct constructs. In the case of materialism, this distinction lies in the types of things one wants to acquire. Materialism is typically defined as the extent to which people value worldly possessions (Belk, 1984). Materialistic people thus find the acquisition of material goods important. Although greed also involves the acquisition of goods, it is less restricted towards the object one wants to acquire. Materialism centers on actual products that signal status or success (Richins & Dawson, 1992). Greed can also be felt towards nonmaterialistic desires, such as food, sex, or power (Seuntjens, Zeelenberg, Breugelmans, et al., 2015).

The difference between greed and maximization lies in its end goal. Although both maximization and greed motivate people to attain their goal, the outcomes are not always the same. For a maximizer, the ultimate goal is to get the best outcome (Schwartz et al., 2002). For a greedy person the ultimate goal is to get the most of a certain outcome. Thus, although greed and maximization might both motivate people's decisions, they do not necessarily lead to the same outcomes.

Lastly, greed is often confused and confounded with self-interest (Balot, 2001). In economic theory, self-interest pertains the idea that rational man should only care about his own outcomes and be indifferent about the outcomes of others (Miller, 1999). Indeed greed and self-interest might often disregard the consequences of others. However, the difference between the two is that self-interest should lead to rational outcomes, whereas this is not always the case for the outcomes of greed.

Greed is thus related, but different, from other motivations. Until recently, there was no means to assess individual differences in greed. However, recently the Dispositional Greed Scale by Seuntjens, Zeelenberg, Van de Ven, and Breugelmans (2015) has been developed that measures greed as a stable personality trait. This scale is reliable, valid, stable over time, and scores on this scale have been demonstrated to predict behavior at a later moment (see also Seuntjens, Zeelenberg, Van de Ven, & Breugelmans, 2016a). In the current research, we relate individual differences on the DGS to financial outcomes in adolescents.

Independently from the DGS three related scales have been developed to measure individual differences in greed (Krekels & Pandelaere, 2015; Mussel et al., 2015; Veselka, Giammarco, & Vernon, 2014). All these authors argue for stable individual differences in greediness and thus see greed as a disposition or trait. There are two main reasons why we selected to use the DGS. First and foremost, we were not aware of these other scales at the time we collected our data. Second, the DGS is firmly grounded in empirical work and its predictive validity is tested elaborately. This we will explain below.

The DGS (Seuntjens, Zeelenberg, Van de Ven, et al., 2015) builds upon earlier findings from the prototype analysis (Seuntjens, Zeelenberg, Breugelmans, et al., 2015), and sees dispositional greed as individual differences in the tendency to always want more and to never be satisfied. This scale with seven items about always wanting more and never having enough was constructed and validated by using over 7500 participants. The DGS has good internal consistency and is highly reliable. In addition, it has good face and construct validity. For example, dispositional greed correlates with related constructs such as maximization, dispositional envy, materialism, and self-interest. Importantly, it is also different from these constructs. For example, whereas materialism is focused on the acquisition of status goods, dispositional greed is a more general desire for more. Lastly, greed has good predictive validity. Dispositional greed predicts behavior in a variety of economic games. For example, it predicts how much people keep in a dictator game, how much they offer in an ultimatum game, and how much people take in a harvesting game. Even if self-interest is included, greed predicts how much people

take above and beyond self-interest. In sum, greed is a stable trait that can be measured in a valid and reliable way by the DGS.

Dispositional differences in greed are also able to predict other types of behavior. For example, greed is often thought to lead to unethical behavior. And indeed people scoring high on dispositional greed tend to behave more unethically and find a variety of transgressions more acceptable (Seuntjens, Zeelenberg, Van de Ven, & Breugelmans, 2016b). Greedy people are more easily lured into these unethical behaviors, because they have lower self-control as they find the possible rewards so tempting. To summarize, dispositional greed is a stable personality variable that has been shown to predict various types of behavior.

## 1.2. Greed and financial behavior

In the current research we relate greed to another type of behavior with which it is often associated. We look at how greed influences adolescents' financial outcomes. Greed is a universal motive in economic theorizing. One of the assumptions in economic theory is the axiom of maximization, also called the axiom of greed, which holds that "if A contains more of one good than B, and at least as much as B of all other goods, A will be preferred over B" (Lea, Tarpy, & Webley, 1987, p. 109). In other words, from a rational viewpoint, people should be greedy and take as much as possible (Smith, 1776/1994). This will eventually not only benefit the actor, but is also thought to benefit society as a whole as it fuels economic growth (Greenfeld, 2001). On the other hand, greed is also often related to negative financial outcomes. People see greed as a cause of the financial crisis (Zandi, 2008) and see it as a potential cause of financial problems and debt (Livingstone & Lunt, 1992; Lunt & Livingstone, 1991). To the best of our knowledge, these assumptions have however not been tested directly, which is what we will do in the current study.

### 1.2.1. Greed and income

Although there is a lot of theorizing about greed and its financial consequences, the empirical research on how greed affects people's financial outcomes is scarce and inconclusive. As greed is characterized by an insatiable desire for more, one would expect that greedy people at least want a higher income. Mussel et al. (2015) did indeed find that greedy people would like to have a higher income. However, this does of course not mean that they also are able to secure more income. Seuntjens, Zeelenberg, Van de Ven, et al. (2015) did not find a relationship between greed and income. Van Muijen and Melse (2015) on the other hand, found that the relationship between greed and income is complex. Sometimes they found a positive relationship between greed and income, sometimes a negative relationship, and sometimes no relationship at all. They found no relationship between greed and income for people under the age of 36 and a negative relationship for people older than 35. However, if they look at specific occupations they find that for some occupations greed pays off while for others it does not. For example, for sales managers they do find that greed is associated with more income. It thus seems that there has to be a fit between one's greed and occupation. For some types of occupations it might help to be greedy, whereas for others it seems to backfire.

Other research that suggests that there might be a link between greed and financial behavior has investigated the link between greed and overearning. Overearning is the tendency to give up on leisure and work and earn more than one can spend (Hsee, Zhang, Cai, & Zhang, 2013). Research suggests that greedy people are more likely to overearn (Seuntjens et al., 2016a). In this research, participants first had five minutes to earn chocolates, and then had five minutes to eat the chocolates that they earned. All left over chocolates were taken away by the experimenter. The more left over chocolates a participant had to return, the more they overearned. Greedy participants worked harder, and as a result earned more. But they earned more than they could actually consume, resulting in more overearning. Even when participants had the opportunity to learn from overearning, and participated in the same study 3 weeks later (and thus knew how much they could or wanted to consume), greed at Time 1 predicted how much they would overearn at Time 2. This thus further illustrates the point that greed is a stable individual difference and shows that greedy people are more focused on the acquisition of resources. Related to this is research by Krekels (2015) who found that greedy people are more productivity oriented, which means that they are more focused on achievements and try to use their time more efficiently. Combined, these studies suggest that there likely is a link between greed and the motivation to acquire more income.

### 1.2.2. Greed and spending

In the current research we are not only interested in how greed influences generating income, but also in how greed influences spending. Seuntjens, Zeelenberg, Van de Ven, et al. (2015) related greed to a variety of individual measures during the scale validation of the DGS. One of these measures was the Tightwads-Spendthrifts scale (Rick, Cryder, & Loewenstein, 2008). This scale measures the extent to which people find it painful to spend money. Tightwads experience high pain of paying, and ideally should spend more money. Spendthrifts experience little pain, and typically should spend less money. Greedy people typically tend more to the spendthrift side and thus often spend too much money. Moreover, greed was also positively related to the Buying Impulsiveness Scale (Rook & Fisher, 1995). This scale measures the extent to which people think and plan before they buy something. Based on these findings it is likely that greedy people spend more as they experience less pain of paying and are more impulsive.

### 1.2.3. Greed, savings, and debt

If greedy people are more focused on generating income, but also more easily spend money, this raises the question if they have money left to save or if they typically fall short on money. Greed is both seen as a potential cause of wealth accumulation (Seuntjens et al., 2016a) and financial problems (Livingstone & Lunt, 1992; Lunt & Livingstone, 1991). Previous research found that greedy people are less satisfied with their financial situations and that they more often have problems making ends meet. This suggests that although people might generate more income, they likely spend even more, leading to more financial problems.

In sum, greed seems to be an important motive for economic behavior. On the one hand, greed is associated with generating more resources, which could lead to a higher income. On the other hand greed is expected to be related to spending more, which can cause financial problems such as saving less and having higher debt. Although the link between greed and financial problems is often assumed, it is, to the best of our knowledge, not been tested before with financial outcomes. Based on the reasoning above, we expected that dispositional greed would be associated with more income, but also with more expenses, less savings, and more debt.

### 1.3. Greed and adolescent financial behavior

In addition to greed being a core economic construct, we think there is another important reason to focus on greed when studying the financial behavior of adolescents. Younger people tend to be greedier than older individuals (Seuntjens, Zeelenberg, Van de Ven, et al., 2015). Research shows that children usually start to develop financial skills (e.g., saving) between the ages of six and twelve (Sonuga-Barke & Webley, 1993). Personality traits and financial behaviors acquired during adolescence and young adulthood are usually maintained during adulthood and thus influence financial decisions in the rest of life (Eccles, Ward, Goldsmith, & Arsal, 2013). For example, Ashby, Schoon, and Webley (2011) find that saving behavior at age 16 predicts saving behavior at age 34. Studying the relationship between greed and financial behavior in adolescents can thus give us insight in how greed is associated with positive financial outcomes such as generating more income, but also how greed is associated with negative financial outcomes in adolescents (spending too much, saving too little, and debts). Especially when the negative consequences of greed outweigh the positive consequences, having these insights is important and can help develop interventions that deal with the underlying causes of the undesired behavior.

Taken together, we expected that greed influences financial behavior, and would lead to a higher income, but also to more troublesome financial outcomes. The relationship with these negative financial outcomes would especially be problematic for adolescents, because they tend to be greedier than older people and because early adopted behavior usually persists in adulthood. We report on a large scale survey with almost 4000 adolescents concerning their financial behaviors. We expected that dispositional greed would be associated with more income, more expenses, less savings, and more debt.

## 2. Method

### 2.1. Sample

These data were collected by Nibud, the Dutch National Institute for Family Finance Information. They conducted a large survey study amongst high school students to assess their financial situation. The Nibud provided us the opportunity to include items in this questionnaire in order to examine how individual differences in greed relate to the financial outcomes of these adolescents.

A total of 3899 high school students from different levels of education (ranging from preparatory lower-level vocational education to pre-university secondary education) completed the survey.<sup>1</sup> Mean age of the participants was 15.15 years<sup>2</sup> ( $SD = 1.64$ ) and 65.2% of the participants was female. In return for their cooperation, 5 gift certificates of €50 were allotted.

Before we analyzed the data we inspected the data of the 3899 participants for extreme values, which are not uncommon in such large datasets. We removed scores of adolescents that indicated that they earned, spend, or saved more than €10,000 a month or said that they currently had more than €10,000 in debts.<sup>3</sup> We did this as these are very unlikely numbers for these adolescents and are therefore likely unreliable. This resulted in the exclusion of 16 cases for expenses and 2 cases for debts. Because there were still several extreme values, we did an outlier analysis and excluded cases that scored more than 3  $SD$  above the mean (income: 39 cases; expenses: 37 cases; savings: 7 cases; debts: 12 cases).

<sup>1</sup> In total there were 7888 high school students that started the questionnaire. A total of 3986 did not complete the survey and were removed from the analyses. In addition, we removed 3 other students that clearly did not fill out the questionnaire seriously (based on their responses to open-ended questions). This left us with the final sample of 3899 students. The completion rate is 49.4%, which is typical for surveys including adolescents (see for example Caskey, Lindau, & Alexander, 2009).

<sup>2</sup> Participants indicated their age, with those under 12 years old choosing the option "under 12" and those older than 18 years choosing "older than 18". For ease of analysis, responses were recoded to a continuous scale ranging from 11 (participants that indicated that they were younger than 12; 0.3%) to 19 (participants that indicated that they were older than 18; 2.0%).

<sup>3</sup> Note that participants are high school students and cannot have study debt yet.

**Table 1**  
Properties of the 3-item dispositional greed scale.

	Loading	M	SD	ITC
1. I always want more.	0.86	2.50	1.12	0.68
2. Actually, I'm kind of greedy.	0.90	2.48	1.15	0.75
3. As soon as I have acquired something, I start to think about the next thing I want.	0.83	2.25	1.16	0.64
Total		2.40	0.99	

Note. Participants ( $N = 3899$ ) were asked to indicate the extent to which they agreed that these items were descriptive of themselves. Responses are measured on 5-point Likert-scales ranging from 1 = *strongly disagree* to 5 = *strongly agree*. A factor analysis produces a one factor solution that explains 74.67% of the variance (Eigenvalue is 2.24). The 3-item scale is reliable ( $\alpha = 0.83$ ).

## 2.2. The Dispositional Greed Scale

Individual differences in greed were assessed using the Dispositional Greed Scale (DGS) (Seuntjens, Zeelenberg, Van de Ven, et al., 2015). The original scale consists of seven items. Because of a constraint on the number of items in the survey, we could only include three items of the DGS. On the basis of theoretical considerations and statistical analyses we created a 3-item version that comprises of the following items: “Actually, I’m kind of greedy”, “I always want more”, and “As soon as I have acquired something I start to think about the next thing I want”. In Appendix A we present a reanalysis of the data of Seuntjens, Zeelenberg, Van de Ven, et al. (2015) for the 3-item version of the DGS. We perform the same tests as we did with the original seven items, but now with only the 3-item version. The 3-item Dispositional Greed Scale produces similar results and has good reliability, temporal stability, and validity.

The 3-item scale also turns out to perform well in the dataset used for the analyses in this research. It is unidimensional and Principal Components Analysis shows that it explains 74.67% of the variance (Eigenvalue = 2.24). On average, participants score 2.41 ( $SD = 0.99$ ) on this scale that ranges from 1 to 5. Internal consistency and reliability of the scale were good ( $ITC > 0.60$ ;  $\alpha = 0.83$ ). See Table 1 for an overview of the scale properties.

## 2.3. Financial indicators

We use four indicators for the financial behavior of the adolescents. Both the income and expenses measure consisted of multiple types of income or expenses. We chose to combine the different types of income or expenses, as previous research suggests that broad constructs (such as dispositional greed) are better at predicting comprehensive behavior than single types of behavior (Weigel & Newman, 1976).

*Income per month.* The income measure consisted of the sum of how much money participants received from their parents (pocket money and clothing allowance), the income they earned with jobs, and other monthly income. Mean monthly income was €81.62 ( $SD = €83.43$ ).

*Expenses per month.* The expenses measure consisted of the sum of a variety of expenses on several categories (food and drinks, clothing and shoes, personal hygiene, jewelry and accessories, recreation, going out, alcohol, smoking, online games, paid apps, computer and computer accessories, books and magazines, subscription for magazines, music and movies, mobile phone, insurance, contribution for sports/instruments, other hobbies, bicycle/moped/car, public transport, presents, school supplies and books, accessories for room, charity, pets, and other expenses). Mean expenses were €97.68 ( $SD = €101.67$ ).<sup>4</sup>

*Savings per month.* The savings measure consisted of the question how much participants saved per month. Mean savings were €37.39 ( $SD = €52.74$ ). A substantial amount of participants indicated that they did not save any money each month (17.7%). For participants that did save money each month, the average was €45.45 ( $SD = €54.91$ ).

*Total debt.* The debts measure consisted of the question how much debt participants had at the moment. Because these high school students are not allowed to take out loans yet, debt was measured as the amount of money they had borrowed from family or friends. On average, participants had outstanding debts of €3.66 ( $SD = 31.48$ ). Most participants indicated that they did not have debts (89.9%). For participants that indicated they had borrowed money the mean debt was €36.32 ( $SD = €93.15$ ).

## 2.4. Statistical analyses

There are several ways to model the data in this study. One could make one joint model in which greed predicts all four financial indicators or one could do separate analyses for all financial indicators. We chose the latter approach for two reasons. First, not all financial indicators are measured in the same magnitude. Income, expenses, and savings are measured per month, whereas debt is the total outstanding debt. Second, we are interested in whether greed relates to these financial outcomes, not in the exact estimate of the effect of for example scoring a scale point higher on greed on how much additional

<sup>4</sup> Note that expenses are in general higher than income. In the analyses we focus on the effects of greed on income and expenses separately from each other and given that we are mainly interested in whether changes in greed would predict changes in income or expenses, we do not think it is problematic. However, it does signal that the actual estimates of financial behavior are unlikely to be completely accurate.

**Table 2**  
Descriptive statistics and bivariate correlations in Study 1.

	<i>N</i>	% yes	<i>Mdn</i>	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.
1. Dispositional Greed	3899	–	2.33	2.40	0.99	–					
2. Income per Month	3716	–	60.82	81.62	83.43	0.12***	–				
3. Expenses per Month	3707	–	69.40	97.68	101.67	0.19***	0.51***	–			
4. Savings <sup>a</sup>	2568	82.3%	25.00	45.45	54.91	–0.11***	0.14***	0.11***	–		
5. Debts <sup>b</sup>	3575	10.1%	6.40	36.32	93.15	0.12***	0.03*	0.10***	–0.05	–	
6. Age	3899	–	15.00	15.15	1.64	0.04*	0.42***	0.38***	0.27***	0.01	–
7. Gender	3899	–	0.00	0.35	0.48	0.02	–0.04*	–0.01	0.04**	0.01	–0.05**

Note. Correlation is significant at the (\*\*\*) 0.001 level, (\*\*) 0.01 level, or (\*) 0.05 level. Gender was coded as a dummy variable with 0 = female and 1 = male. Correlations are computed with log-transformed variables. If we run the analyses on the untransformed data we find a similar pattern.

<sup>a</sup> If we include participants who do not save each month average savings are *Mdn* = 20.00, *M* = 37.39, *SD* = 52.74.

<sup>b</sup> If we include participants who do not have debts average debts are *Mdn* = 0.00, *M* = 3.66, *SD* = 31.48.

euro of income that would generate. Note that expenses are higher than income in the current data, which suggests that the estimates are not completely accurate. It is possible that adolescents forget to report some of the income they receive, or report expenses that are actually paid by their parents (for example, they might not have reported money received to buy food at school as income, but did report those expenses). Third, there are large differences in the distributions between the four indicators, which leads to different tests being more appropriate for different financial indicators (as we explain below).

To investigate the relationship between greed and income and expenses we conducted linear regression analyses. As is often the case with monetary data, the data for income and expenses was positively skewed. In order to deal with the skewness, we conducted log-transformations to normalize the data.<sup>5</sup> Because the data of savings and debt was strongly censored (with many respondents indicating to either not to save or not to have debts) a Tobit regression was most appropriate. Tobit is useful in these cases, as linear regression analysis will lead to biased coefficients. To further investigate the relationship between greed and monthly savings and total debt, we conducted logistic regression analyses to see whether greed predicted if people saved or had debt at all (yes or no), and if this was the case, we investigated if greed predicted the amount of savings and debt using linear regression analyses.<sup>6</sup> Based on these considerations we chose to analyze the effects of greed on each of the four indicators separately.

Because we used multiple univariate tests, the reader might worry about the risk of inflated Type I error. In order to counteract this inflation, we use a Bonferroni correction on all analyses, and interpret effects as significant when alpha is lower than 0.0125.

### 3. Results

Table 2 provides an overview of the descriptive statistics and zero-order correlations between dispositional greed, the financial indicators, age, and gender. Linear regression analyses tested the relationship between dispositional greed and income and expenses per month. As Table 3 shows, dispositional greed was significantly related to having more income ( $\beta = 0.10$ ) and to spending more money ( $\beta = 0.18$ ).<sup>7</sup> Because the data for savings per month and total debt was censored (17.7% of the participants indicated that they saved €0 per month; 89.9% of the participants indicated they had €0 debt), we analyzed these variables with Tobit regression analyses. Participants scoring high on dispositional greed had significantly less savings per month ( $\beta = -0.09$ ), and a higher total debt ( $\beta = 0.20$ ).<sup>8</sup>

To further explore the relationship between dispositional greed and savings per month and total debt we conducted binary logistic regression analyses to see if greed predicts whether adolescents are more likely to save and have debts and subsequent linear regression analyses to investigate how high their savings per month and total debt are (given that they save and have debts in the first place). Dispositional greed predicted if people saved money each month, odds ratio = 0.68, *Wald* = 55.33,  $p < 0.001$ . As an indication of the effect size, this implies that an increase of 1 point on the Dispositional Greed Scale (which is also approximately +1 SD) results in a 47% decrease in the odds that someone saves money each month. However, for those who save, dispositional greed did not predict how much people saved per month,  $b = 0.01$ ,  $\beta = 0.01$ ,  $t = 0.53$ ,  $p = 0.597$ .

The second binary logistic regression analysis found that dispositional greed also predicted if people had a debt or not, odds ratio = 1.47, *Wald* = 48.39,  $p < 0.001$ . Thus, an increase of 1 point on the Dispositional Greed Scale resulted in a 47% increase in the odds of having debts. For people who did have a debt, there was no significant effect of greed on how high that debt was,  $b = 0.16$ ,  $\beta = 0.11$ ,  $t = 2.14$ ,  $p = 0.033$ .

<sup>5</sup> We find similar patterns if we do not transform the data.

<sup>6</sup> Again, we conducted log transformations to normalize the data.

<sup>7</sup> If we also include income as a covariate, we find similar results.

<sup>8</sup> If we also include income and expenses as covariates, we find similar results.

**Table 3**

Linear regression analyses of income per month and expenses per month on dispositional greed and Tobit regression analyses of savings per month, and total debt on dispositional greed (controlled for age and gender).

	Income per month					Expenses per month					Savings per month					Total debt				
	<i>b</i>	s.e.	$\beta$	<i>t</i>	<i>p</i>	<i>b</i>	s.e.	$\beta$	<i>t</i>	<i>p</i>	<i>b</i>	s.e.	$\beta$	<i>t</i>	<i>p</i>	<i>b</i>	s.e.	$\beta$	<i>t</i>	<i>p</i>
Greed	0.10	0.01	0.11	7.42	<0.001	0.21	0.02	0.18	11.80	<0.001	−4.97	1.17	−0.09	−4.25	<0.001	24.87	3.70	0.20	6.72	<0.001
Age	0.23	0.01	0.41	27.83	<0.001	0.27	0.01	0.38	25.16	<0.001	12.01	0.69	0.21	17.45	<0.001	−0.72	2.23	−0.01	−0.32	0.746
Gender	−0.03	0.03	−0.02	−1.13	0.260	0.01	0.04	0.00	0.20	0.842	9.58	2.39	0.17	4.00	<0.001	2.97	7.56	0.02	0.39	0.694

Linear regression analyses are conducted on the transformed variables. *b*'s are the unstandardized coefficients.  $\beta$  are the standardized coefficients.

## 4. General discussion

The aim of the current research was to investigate the relationship between adolescents' financial behavior and dispositional greed. In order to investigate this, we first constructed a shortened, 3-item version of the dispositional greed scale. Then we related this 3-item dispositional greed scale to four financial indicators. We found that adolescents who scored higher on dispositional greed had more expenses, were less likely to save, and more likely to have a debt. On the bright side, dispositional greedy adolescents also had a higher income.

### 4.1. Implications for understanding adolescent financial behavior

Understanding adolescent financial behavior is important. The personality traits and behaviors that people acquire during adolescence often persist in adulthood and thus have important consequences for the rest of life (Eccles et al., 2013). Although previous research suggests a relationship between greed and financial behavior (Lunt & Livingstone, 1991; Seuntjens, Zeelenberg, Van de Ven, et al., 2015; Seuntjens et al., 2016a), this is, to our knowledge, the first study that actually investigated the relationship between greed and actual financial outcomes in adolescents.

In the current research we found that greed was associated with positive financial outcomes on the one hand (more income), and negative financial outcomes on the other hand (more expenses, less likely to save, more likely to have a debt). Although the data is cross-sectional, which makes drawing strong conclusions about causality difficult, past research suggests that dispositional greed is a relatively stable personality trait (Seuntjens, Zeelenberg, Van de Ven, et al., 2015; Seuntjens et al., 2016a). Although we acknowledge that more research is needed to investigate the extent to which greed is stable over the lifespan, we believe that based on the current data, previous research, and theoretical considerations, it makes more sense to argue that the dispositional tendency to be greedy predicts behavior than to expect that adolescents' behavior influenced their greedy personality.

We found that greedy adolescents had a higher income than less greedy adolescents. The income measure consisted of pocket money, clothing allowance, and their own generated outcome from side jobs. One could argue that adolescents that people that are greedy also share this priority with their children, and as a result their children likely become greedier. However, previous studies have consistently found that people that are brought up in low socioeconomic environments are actually greedier than people that grew up in families with high socioeconomic status (SES) (Krekels, 2015; Poluektova, Efremova, & Breugelmans, 2015). It is argued that people develop the dispositional tendency to be greedy to deal with the resource scarcity and uncertainty that is associated with low SES. Based on this reasoning one would predict that if adolescents' greed is formed based on their family situation, adolescents with high income (who are more likely from wealthy families) would be less greedy. However we do not find this. We believe this suggests that greedy adolescents might receive more pocket money and clothing allowance because they ask for more, and hence adolescents that are greedy generate more income in this way. These findings corroborate earlier findings that have found that greedy people work harder and are more focused on acquisition of resources (Seuntjens et al., 2016a).

Despite dispositional greed being associated with more income, the other three financial indicators show the more problematic effects of greed. People often associate greed with negative financial outcomes (Lunt & Livingstone, 1991). In line with this reasoning and our expectations, we found that greed was indeed associated with spending more per month, being less likely to save, and being more likely to have a debt. Previous research (Seuntjens, Zeelenberg, Van de Ven, et al., 2015) suggests that greedy people have more problems making ends meet, and that greedy individuals are more impulsive and have lower self-control (characteristics that have previously been related to all types of financial problems; Gathergood, 2012; Gathergood & Weber, 2014). It seems that greedy adolescents' tendencies to choose short term pleasure over beneficial long term consequences makes them more likely to get into financial troubles.

Individuals' financial situation is thus both positively and negatively influenced by their disposition to be greedy. Although the effects of greed on financial behavior might be small, they can have large consequences over a life time. Although we should interpret the exact numbers with care, as they are based on self-report data that does not seem fully accurate, we do see that dispositional greed has effects that are quite serious. For example, if we look at expenses, we see that, in our sample, a 15 year old male scoring  $-1$  SD on the DGS spends an estimated average of €85.29 euros a month, whereas adolescents with the same age and gender who score  $+1$  SD on the DGS spend an estimated average of €116.27

per month. Assuming that the same trend persists in adulthood, and individuals earn more as adults, this means that greedy individuals will spend thousands of euros more per year than less greedy individuals. Especially for the negative consequences of greed, in this case spending more, being less likely to save, and being more likely to have a debt, it is thus important to identify which people are at risk.

Previous research suggests that the disposition to be greedy is formed at an early age (Krekels, 2015). According to Krekels, a possible explanation for the development of greed is that it helps people deal with resource uncertainty. In addition, younger people tend to be greedier than older people (Seuntjens, Zeelenberg, Van de Ven, et al., 2015). Thus, younger people seem more likely to get into trouble because of their greediness. Knowing that especially greedy people are more likely to get into financial trouble can help with the prevention of financial problems, as it gives the opportunity to target those people for intervention programs.

#### 4.2. Implications for greed research

Our research thus shows a duality in the consequences of greed. On the one hand we find that greed is associated with positive outcomes (generating more income), while on the other hand we find that greed is associated with negative outcomes (having more expenses, being less likely to save, being more likely to have a debt). The idea that greed is ambivalent is common. Early scholars such as Thucydides (460–395 BCE, see Zagorin, 2009) argued that greed can be both positive and negative. Furthermore, Hume (1739/2001) called greed a double-edged sword, as it can motivate people to attain their goals, but also can have destructive consequences for society. Typically the duality in consequences of greed is depicted as positive consequences for the individual and negative consequences for others surrounding the greedy individual. An interesting finding of the present research is that the duality in greed also exists at the intra-individual level, meaning that greed can have positive and negative consequences for the same individual.

Despite dispositional greed being associated with more income, the other three financial indicators show the more problematic effects of greed. People often associate greed with negative financial outcomes (Lunt & Livingstone, 1991). In line with this reasoning and our expectations, we found that greed was indeed associated with spending more per month, being less likely to save, and being more likely to have a debt. Previous research (Seuntjens, Zeelenberg, Van de Ven, et al., 2015) suggests that greedy people have more problems making ends meet, and that greedy individuals are more impulsive and have lower self-control (characteristics that have previously been related to all types of financial problems; Gathergood, 2012; Gathergood & Weber, 2014). It seems that greedy adolescents' tendencies to choose short term pleasure over beneficial long term consequences makes them more likely to get into financial troubles.

For the current research we constructed a reliable and valid shortened version of the DGS. Having a 3-item version of the DGS can be useful in situations where there are time limits, restraints on the number of questions, or when greed is not the main focus of the research. We refer again to Appendix A for the re-analysis of the original data to demonstrate the validity and reliability of this short version of the Dispositional Greed Scale.

#### 4.3. Directions for further research

As we discussed before, the data in this study was cross-sectional, which makes it hard to draw conclusions about causality. Although we believe that it is more likely that greed (as a personality trait) influences financial behavior than the other way around, subsequent research on the relation between greed and financial behavior is welcome. For example, a longitudinal study that would follow people over several years could shed more light on the dynamic effects between greed and financial behavior. Such a study would not only be informative with regard to the causality of this relationship, it would also give more information about how the relationship between greed and financial outcomes develops over time. For example, such a study would also provide information about whether income grows faster over the years for greedy people compared to less greedy people. Alternatively, such a study could examine whether people who acquire money become greedier or less greedy over time.

Moreover, further research also look at the relationship between greed and financial behavior in adults. In this research we revealed that adolescents' individual differences in greed were related to having more income, more expenses, being less likely to save, and being more likely to have debts. For further research it would be interesting to see if similar associations exist in adults. For example, income of high school students is highly depended on the amount of money they receive from their parents. For adults, income mostly comes from salary or social welfare. It would be both interesting and important to see if greed is associated with financial outcomes in adults as well.

## 5. Conclusion

Greed is often seen as an important motive for economic behavior. In this research we found that individual differences in greed predicted adolescents' financial behavior. Dispositional greed was associated with generating more income and having more expenses, saving less often, and having debt more often. In line with common conceptions about greed, this research thus found that greed can have positive as well as negative consequences for financial behavior.



## Authors' note

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## Appendix A: The development of the 3-item Dispositional Greed Scale

In this appendix we describe how we came from our 7-item Dispositional Greed Scale—DGS (Seuntjens, Zeelenberg, Van de Ven, et al., 2015) to the 3-item version that we used in this research. The reason for this shortening was that the NIBUD (the organization that allowed us to include questions in their survey) only allowed us to include 3 additional questions. We came to the three items on the basis of theoretical reasons (in our view these items capture the core of greed best, cf. Seuntjens, Zeelenberg, Breugelmans, et al., 2015), and statistical reasons. These latter are reported below.

To investigate if the shortened 3-item version of the DGS worked correctly we reanalyzed all the data in our original scale construction paper (Seuntjens, Zeelenberg, Van de Ven, et al., 2015). As is apparent from Tables A1 and A2 in this Appendix, the three items together form a unidimensional scale with good reliability, internal consistency, and temporal stability (see Tables A1 and A2). In Tables A3 and A4 we find that the 3-item version of the DGS has similar construct validity than the original scale. Table A5 shows that, as the 7-item DGS, the 3-item version of the DGS is different from materialism. Lastly, in Table A6 we find that the 3-item DGS predicted behavior in a similar way than the 7-item version. The 3-item DGS predicted how much money people kept for themselves in a dictator game and an ultimatum game. We also found a marginal significant trend for greedy people rejecting lower offers more. Lastly, we found that greed predicted how much forest participants harvested in a harvesting game.

**Table A1**

Re-analysis: The three items of the dispositional greed scale, including factor loadings and reliability for samples 1–4 in Study 1 (Seuntjens, Zeelenberg, Van de Ven, et al., 2015).

Items	Samples			
	1 N = 167 Dutch Students	2 N = 236 Dutch Students	3 N = 345 American MTurk	4 N = 5344 Dutch Representative
1. I always want more.	0.78	0.82	0.90	0.88
2. Actually, I'm kind of greedy.	0.72	0.83	0.87	0.89
3. As soon as I have acquired something. I start to think about the next thing I want.	0.81	0.83	0.85	0.85
Eigenvalue	1.78	2.04	2.23	2.28
Explained variance	59.40%	68.11%	76.26%	76.06%
Cronbach's $\alpha$	0.65	0.77	0.84	0.84
Temporal stability	0.72	0.79	–	–

Note. Participants are asked to indicate the extent to which they agreed that these items were descriptive of themselves. Responses were measured on 5-point Likert-scales ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

**Table A2**

Re-analysis: Means, standard deviations, and corrected item-total correlations of the items of the 3-item dispositional greed scale for samples 1–4 in Study 1 (Seuntjens, Zeelenberg, Van de Ven, et al., 2015).

Item	Samples											
	1			2			3			4		
	N = 167			N = 236			N = 345			N = 5344		
	M	SD	ITC	M	SD	ITC	M	SD	ITC	M	SD	ITC
1. I always want more.	2.35	0.98	0.51	2.90	1.09	0.60	3.03	1.11	0.76	2.29	1.05	0.72
2. Actually, I'm kind of greedy.	2.92	1.02	0.47	2.66	1.04	0.60	2.62	1.16	0.69	2.06	0.99	0.74
3. As soon as I have acquired something. I start to think about the next thing I want.	2.66	1.11	0.42	2.37	1.06	0.60	2.76	1.20	0.68	1.90	0.95	0.67
Total	2.65	0.80		2.64	0.88		2.80	1.01		2.08	0.87	

Note. Participants are asked to indicate the extent to which they agreed that these items were descriptive of themselves. Responses were measured on a 5-point Likert-scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

**Table A3**

Re-analysis: Correlations of the 3-item dispositional greed scale with other measures for samples 1–4 in Study 1 (Seuntjens, Zeelenberg, Van de Ven, et al., 2015).

Construct	Samples			
	1 N = 167	2 N = 236	3 N = 345	4 N = 5344
Maximization Scale	0.22**	0.22**	0.34***	
Social Value Orientation	0.23**	0.13*		
Dispositional Envy Scale	0.35***	0.25**		
Material Values Scale	0.55***	0.56***	0.69***	0.63***
Tightwads-spendthrifts Scale			0.36***	
Self-Control Scale	−0.31***	−0.20**		
Impulsiveness <sup>7</sup>	0.23**		0.33***	
Buying Impulsiveness Scale			0.45***	
Temporal preferences		−0.07		
Risk aversion		−0.01		
Psychological Entitlement Scale	0.29***			
Self-Report Psychopathy Scale	0.30***	0.21**		
Perspective taking	−0.30***			
Emphatic Concern	−0.21**			
Rosenberg Self-Esteem Scale		−0.13		−0.20***
Satisfaction With Life Scale		−0.07		−0.07***
Beck Depression Inventory		0.02		
Iowa-Netherlands Comparison Orientation Measure	0.13		0.39***	
Social desirability				−0.26***
Extraversion	−0.03	0.08		−0.02
Agreeableness	−0.09	−0.13*		−0.21***
Conscientiousness	−0.115	−0.04		−0.21***
Emotional Stability	−0.19*	−0.06		−0.25***
Openness	−0.17*	0.00		0.03

Note. Correlations are only reported if the measure was in the sample.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

**Table A4**

Re-analysis: Regression analyses of demographics on the 3-item dispositional greed scale in sample 4 of Study 1 (Seuntjens, Zeelenberg, Van de Ven, et al., 2015).

Variable	<i>b</i>	<i>s.e.</i>	$\beta$	<i>t</i>	<i>p</i>
<i>Step 1</i>					
Age	−0.02	0.00	−0.37	−24.09	<0.001
Gender (0 = female; 1 = male)	0.18	0.02	0.13	8.33	<0.001
<i>Step 2</i>					
Income (net income per month in €'s)	0.00	0.00	0.10	0.65	0.516
Education (ranging from 1 = elementary education; 6 = university)	0.01	0.01	0.02	1.03	0.304
Political orientation (0 = left; 10 = right)	0.03	0.01	0.09	5.77	<0.001
Religiosity (0 = not religious; 1 = religious)	−0.04	0.03	−0.02	−1.41	0.159

**Table A5**

Re-analysis: (Partial) Correlations of the 3-item dispositional greed scale and materialistic value orientation with non-materialistic and materialistic desires in Study 2 (Seuntjens, Zeelenberg, Van de Ven, et al., 2015).

	Descriptives		Correlations		Partial correlations	
	<i>M</i>	<i>SD</i>	Greed (DGS)	Materialism (MVS)	Greed (DGS)	Materialism (MVS)
When I am eating a bag of chips, I don't want to stop until the bag is finished.	2.89	1.21	0.12***	0.06	0.24***	−0.11
When I am single, I like to have casual sex with as many people as possible.	2.21	1.26	0.24***	0.15*	0.18**	−0.00
When I am using social networking sites (e.g. Facebook, LinkedIn), I want to have as many friends as possible.	2.24	1.03	0.25***	0.25***	0.12*	0.12*
When I see a newer model of my phone I immediately want to have it.	2.49	1.21	0.36***	0.44***	0.11	0.30***

Note. Dispositional greed was measured on a 5-point Likert-scales, ranging from 1 = strongly disagree to 5 = strongly agree ( $M = 2.70$ ,  $SD = 0.96$ ). Reliability of the scale was good ( $\alpha = 0.80$ ). Partial correlations are the correlations between desires with greed (controlled for materialism) and desire with materialism (controlled for greed).

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

\*\*\*  $p < 0.001$ .

**Table A6**

Re-analysis: The 3-item dispositional greed scale as a predictor of behavior in a dictator game, ultimatum game, and harvesting dilemma (Studies 3, 4, and 5; Seuntjens, Zeelenberg, Van de Ven, et al., 2015).

DV	Greed			Relationship with DV		
	M	SD	$\alpha$	$\beta$	t	p
Study 3: Dictator Game: Keeping Money	2.87	0.93	0.81	0.20	3.48	0.001
Study 4: Ultimatum Game – Proposers: Keeping Money	2.95	0.89	0.79	0.15	2.60	0.010
Study 4: Ultimatum Game – Responders: Rejecting Offers	2.99	0.89	0.75	0.12	1.85	0.066
Study 5: Harvesting Game: Harvesting Trees	2.84	0.99	0.83	0.20	3.47	0.001

Note. Responses were measured on a 5-point Likert-scales, ranging from 1 = strongly disagree to 5 = strongly agree ( $M = 2.70$ ,  $SD = 0.96$ ).

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