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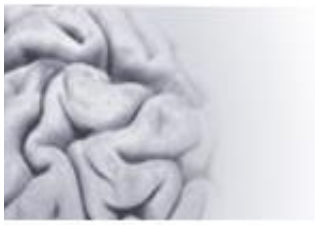

On the Effect of Plausible Deniability, Gender, and Anxiety on Altruism

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Contents

Abstract

Previous research has demonstrated that social preferences drive social decision-making however, social preferences are often crowded out by incentives. The current study examines how probabilistic incentives affect the willingness to help to counter the crowding out effect. Willingness was measured through a vignette. The results show that regardless of condition, participants scored similarly on willingness to help. Anxiety was positively associated with willingness to help, suggesting that a more anxious person would be more likely to help a stranger. In addition, compared to male participants female participants showed less willingness to help another person. In conclusion, these findings show that probabilistic incentives do not affect willingness to help. Willingness to help can be influenced by anxiety and gender.

Layman's Abstract

Crowding out of social preferences happens when a person receives a reward for completing an activity but afterward loses intrinsic motivation to do the action. In the current study, probabilistic incentives were used to relieve the crowding out effect. A raffle was introduced, in a hypothetical scenario, to gain an incentive designed to counter the crowding out effect of social preferences, such as altruism. The results showed that everyone seemed similarly willing to help a stranger, regardless of the type of incentive. Furthermore, those who were more anxious were somewhat more willing to help. It was also discovered that women were less likely than men to help a stranger. In conclusion, anxiety and gender seem to influence the willingness to help, and probabilistic incentives do not influence the willingness to help.

On The Effect of Plausible Deniability, Gender, and Anxiety on Altruism

Understanding social preferences is essential for decision-making that involves others. Particularly, this understanding can aid policies of incentives within organisations, governments, and personal interactions (e.g., Gneezy & Rustichini, 2000, Fehr & Fischbacher, 2002). In an example by Teraji (2021), a local government wants to ensure that all residents recycle. The local government thinks that giving residents monetary rewards for recycling will resolve this issue. Contrary to what the local government anticipates, past research suggests that over time residents will start to flout the laws because the monetary incentive no longer serves as a motivator to recycle (Teraji, 2021). An explanation for what occurs in this example is that the incentive might have pushed out pre-existing tendencies regarding recycling, such as compassion for the environment, prosocial behaviour, and altruism (Bowles & Polana-Reyes, 2012). This refers to the crowding out of social preferences, which occurs when a person receives a reward for completing an activity but afterward loses an intrinsic motivation to do that action (Heyman & Ariely, 2004; Gneezy, Meier, & Rey-Biel, 2011; Bowles & Polana-Reyes, 2012).

Social preferences are a strong driver of human behaviour (e.g., Bowles & Hwang, 2008; Bowles & Polanía-Reyes, 2012; Everett et al., 2015). For instance, Fehr and Fischbacher (2002) examined social preferences in the light of competition, cooperation, and incentives within organisations. They explored what motivates employees to elicit effort in a company. The authors suggest that incentives work depending on the context. They state that when distrust is present incentives might create a hostile environment in the workplace, which results in less effort from employees. However, in the absence of distrust, incentives did not create a hostile environment. Rather, employees appeared more effortful

based on their social preferences. Thus, incentive systems that consider social preferences increase effort from employees (Fehr & Fischbacher, 2002).

Similarly, the effect of incentives on altruism depends on the context. In a study by Heyman and Ariely (2004), participants were either given a monetary incentive or not given any incentive to help someone with a task. Participants showed equal effort regardless of the incentive, which shows that social preferences influenced their effort to help when they did not receive an incentive compared to the monetary incentivized effort. Furthermore, Bowles and Polanía-Reyes (2012) conclude that using incentives alone might backfire in terms of crowding out social preferences, but that combining incentives with social preferences may lessen the crowding out effect. However, why does this crowding out happen to begin with?

One of the drivers for the crowding out of social preferences lies in the framing of incentives (Bowles & Hwang, 2008). That is, context matters when it comes to the crowding out of social preferences. For example, when a task involves prosocial activities, a context is created where an individual is perceived as selfless. Still, when the individual is monetarily rewarded for this prosocial task, the individual might be perceived as being self-interested rather than selfless (Bowles & Hwang, 2008).

In “The Gift of Blood”, Richard Titmuss (1998) explains this phenomenon in the setting of blood donation. The act of donating blood is usually seen as altruistic. When people voluntarily donated blood, without receiving a monetary reward, the blood supply system was more efficient and altruistically driven. However, when monetary rewards were given for blood donation the opposite occurred, cooperation toward donating blood decreased. In this case, the context turned into a reward-driven setting in which decisions

are driven by self-interest rather than appropriate ethical behaviour. Thus, the crowding out of altruistic social preferences resulted in less cooperation. Mellström and Johannesson (2008) empirically tested the influence of rewards in the setting of blood donation. They replicated the effects described by Titmuss (1998), the crowding out of social preferences seems to be driven by the meaning tied to receiving a monetary incentive, which is being perceived as a self-interested individual, whereas a person would be more likely to cooperate if there were no incentives involved since this would be perceived as acting out of one's altruistic tendencies.

Accordingly, context plays a role in the way incentives are perceived by others and individuals. For incentives to work it is important that the incentive does not harm an individual's social preferences when an individual performs a task in the context of altruism (e.g., Bowles & Hwang, 2008; Mellström & Johannesson, 2008). Therefore, an intervention to counter the crowding out of social preferences could be the use of plausible deniability. According to Watson (1965) and Hodges (2020), the phenomenon of plausible deniability happens when a fact's qualities may be easily refuted, negating any attempt to transmit them. This can create uncertainty about the consequences and effects of the outcome of a decision.

Previous work has demonstrated that uncertainty can enhance altruism (Kappes et al., 2018; Bolton et al., 2020). When an individual is uncertain about the impact of their choices on others, they will be more likely to consider the welfare of others compared to when they are certain about their impact. This highlights the importance of impact uncertainty, meaning that when the consequences of decisions are uncertain people will be more likely to act prosocial than when there is no uncertainty.

Bolton et al. (2020) illustrated this effect of uncertainty in a similar way. Instead of using monetary incentives to promote prosocial behaviour, the authors used social observation. In their study participants were uncertain about being socially observed when performing a prosocial act. The researchers found that when this uncertainty was present participants were more likely to act out of their social preferences and were more willing to perform the act.

Uncertainty regarding receiving monetary incentives can be explained similarly; when monetary incentives are uncertain people are more likely to be perceived as acting out of altruism. Silver and Silverman (2022) suggest that an observer will view an individual who volunteers at a charity event in exchange for a raffle ticket as more purely motivated and praiseworthy than one who volunteers in exchange for a gift card of equal value. They reason that individuals who volunteer at charity, for either a raffle ticket or gift card, will be judged by observers based on the ulterior motive they might have, and the observer may consider what the individual would have done if no rewards had been offered. They state that individuals who volunteer in turn for a raffle ticket are seen as individuals who act out of prosocial tendencies since they are uncertain about receiving the reward in a raffle. They were rated as more willing to act based on prosocial motives compared to individuals who volunteered in turn for a gift card.

Following the same logic, in the current study plausible deniability will be used to create a probabilistic incentive to promote altruism. I will examine how incentives affect social preferences and whether employing plausible deniability can prevent social preferences from being crowded out. Based on preliminary research regarding using uncertainty to promote prosocial behaviour, I hypothesize that participants will be more

willing to help a stranger when presented with a plausibly deniable incentive, compared to being presented with a certain incentive.

While not the main emphasis of this study, gender, and anxiety are expected to modulate willingness to help based on past work. For instance, when a financial incentive was provided, Mellström and Johannesson (2008) discovered that the number of blood donors decreased. This crowding out effect was found to be stronger in women. The opportunity to donate to charity also helped women avoid the crowding out effect. This occurrence can be explained by certain stereotypes; compared to men, women's gender roles often promote women being selfless and some themes have been identified that women orientate towards caring and responsibility for others (Eagly & Crowley, 1986). This indicates that women would be more willing to help another person because they have more regard for others compared to men. Furthermore, Eagly and Crowley (1986) found that when so-called masculine skills are involved in a situation where women could potentially be harmed, men help considerably more. Therefore, in the current study, it is unclear if women will help more because they care more about others or if men will help more because they feel more competent since the task involves intense physical activity (see Methods).

Second, Grecucci et al. (2013) state that having anxiety significantly lowers one's motivation to make decisions. Particularly worried people are less prone to engage in social confrontation. The researchers discovered that individuals with suboptimal levels of serotonin—a neurotransmitter that affects mood and is connected to one's level of anxiety—are less likely to engage in prosocial behaviour. Furthermore, concerning gender it has been widely known that women are more risk aversive (Croson & Gneezy, 2009).

One reason related to social interaction is that women are more risk averse to avoiding negative social consequences, e.g., helping a stranger (Sarin & Wieland, 2016). When deciding under uncertainty, Sarin and Wieland (2016) found that men and women make similar decisions when betting in uncertain circumstances (Nelson, 2015). That being the case, differences in gender and anxiety might have different outcomes under plausible deniable conditions. On one hand, women are more likely to help a stranger than men due to higher regard, and on the other hand women are less likely to help a stranger due to risk aversion. Therefore, I examine how anxiety and gender affect willingness to help. I hypothesize that those with high levels of anxiety will be less willing to help someone else and that women will be less likely to help than men.

In conclusion, understanding how incentives, social preferences, and individual characteristics interact will be essential in developing future interventions that promote and even sustain cooperative behaviour. By exploring how plausible deniability will affect the willingness to help another, this study will be able to advance the existing literature on how to promote social preferences.

Method

Participants

Initially, 487 respondents were recruited through Prolific (Prolific, 2023). Participants gave their consent for the use of the data collected during this study. Twenty-eight respondents who did not provide their consent for the use of their data did not participate. Second, due to an error in the coding of the design, data loss occurred, and sixty-four data points of the dependent variable (willingness to help) were not obtained. Finally, a total of 396 participants completed the study. This sample consisted of

participants between the ages of 19 and 49 (M = 30.01, SD = 5.66). Among these respondents, 49% reported to be female, 49% reported to be male, and 2% identified as non-binary.

Furthermore, participation was anonymous in this study and participants were monetarily compensated with 2 pounds upon completion of the study. Participants completed the study in an average of 8.18 minutes. The method for performing this study was approved by the ethical committee of Leiden University.

Materials

The primary objective of this study was to test the willingness to help a stranger, a crucial variable for drawing inferences about individuals' social preferences. Based on previous work (Heyman & Ariely, 2004), a vignette was created as the measurement tool for willingness to help (Heffner et al., 2021).

The vignettes were designed to prompt participants to envision themselves in specific situations (Atzmüller & Steiner, 2010). By doing so, I sought to elicit social preference regarding helping others under different incentive conditions. The participants were presented with one of the vignettes below, including a slider to rate their willingness to help (text in italics was common to all conditions):

> Imagine you are taking a stroll around your neighbourhood one day and from far you see a person loading their belongings into a van. When you are nearing the van, the person approaches you and asks if you are willing to help load a heavy sofa into the van.
>
> **[Control]** The person needs extra help from two people to help load a heavy sofa into the van. Rate on a scale of 1 to 11 how willing you are to

help. One (1) being “I will for sure not help”, and eleven (11) being “I will help for sure”.

[Incentive] The person needs extra help from two people to help load a heavy sofa into the van. The person offers $5 to each individual who helped. Rate on a scale of 1 to 11 how willing you are to help. One (1) being “I will for sure not help”, and eleven (11) being “I will help for sure”.

[Low probability] The person needs extra help from four people to help load a heavy sofa into the van. The person has only $5 in cash and offers to do a raffle to give the $5 to one out of the four individuals who helped. Rate on a scale of 1 to 11 how willing you are to help. One (1) being “I will for sure not help”, and eleven (11) being “I will help for sure”.

[High probability] The person needs extra help from two people to help load a heavy sofa into the van. The person has only $5 in cash and offers to do a raffle to give the $5 to one out of the two individuals who helped. Rate on a scale of 1 to 11 how willing you are to help. One (1) being “I will for sure not help”, and eleven (11) being “I will help for sure”.

Procedure

Participants were first asked to provide their consent to use their answers as data in this study. After giving their consent, participants were then randomly assigned to one of the four conditions. In the assigned condition participants were asked to rate their willingness to help on a scale of 1 to 11. Subsequently, they answered the attentional check and went to the second part of the study independently from the current study, thus this will not be discussed and analysed here. Additionally, participants reported demographics

(gender and age) and anxious scale [range 0 to 21 scores, of which 5, 10, and 15 represent cut-off points for mild, moderate, and severe anxiety, respectively] (Spitzer et al., 2006; Williams, 2014). Finally, they were thanked for their participation and were debriefed.

Data preparation and analysis

To assess potential variations in the willingness to help across the different scenarios, an Analysis of Variance (ANOVA) was conducted. This statistical technique enables the examination of the difference in means of individuals who participated in the distinct scenarios (considered as an independent categorical variable) concerning their levels of willingness to help (dependent quantitative variable).

Data preparation was performed using Microsoft Excel. Subsequently, the Excel file was saved in CVS (comma separate values) format and transferred to JASP for analysis. JASP is an open-source project supported by the University of Amsterdam. JASP was chosen due to its user-friendly and intuitive interface. JASP offers standard analysis procedures in both their classical and Bayesian form and ensures both reproducible and interactive data by saving the full data and analysis to a .jasp file (JASP Team, 2023).

In addition to the main ANOVA, exploratory analyses were conducted to get insights into the connection between gender and willingness to help, and anxiety score and willingness to help. A t-test was conducted to assess the relationship between gender (male and female) willingness to help. For gender only female and male were used to simplify interpretation, since previous research used these categorizations as well (e.g., Espinosa & Kovářík, 2015; Croson & Gneezy, 2009). Lastly, a correlational analysis was performed to assess the relationship between anxiety and willingness to help.

Results

The effect of plausible deniability on willingness to help

Participants were similarly willing to help across all conditions. Looking at the willingness to help, the average mean across participants was 6.75 (*SD* = 3.20), the incentive group reported a mean of 7.30 (*SD* = 3.36), the low probability group reported a mean of 6.36 (*SD* = 3.41), and the high probability group reported a mean of 6.65 (*SD* = 3.45) (Table 1).

Several assumptions needed to be checked in order to run the analysis to test the main hypothesis.

First, the one-way ANOVA test assumptions were checked. Levene's test was non-significant ($F(3) = .235$, $p = .872$), indicating that the assumption of homogeneity of variance was not violated. Normality was first checked with a Q-Q Plot and deviations were noted at both ends of the graph. Subsequently, I tested for normality with a Kolmogorov-Smirnov test. The test results were significant meaning, that willingness to help was not distributed normally ($D(396) = .138$, $p < .001$).

The one-way ANOVA revealed that there was not a statistically significant difference in willingness to help (Table 1) ($F(3) = 1.479$, $p = .220$, $\eta^2 = .011$). In addition, a nonparametric test was conducted to account for the nonnormality in the distribution of willingness to help. The Kruskal-Wallis test revealed that there is no difference between the conditions ($H(3) = 4.845$, $p = .183$).

In conclusion, there was no evidence found supporting the main hypothesis stating that willingness to help will be higher in the plausibly deniable conditions compared to the control and incentive conditions.

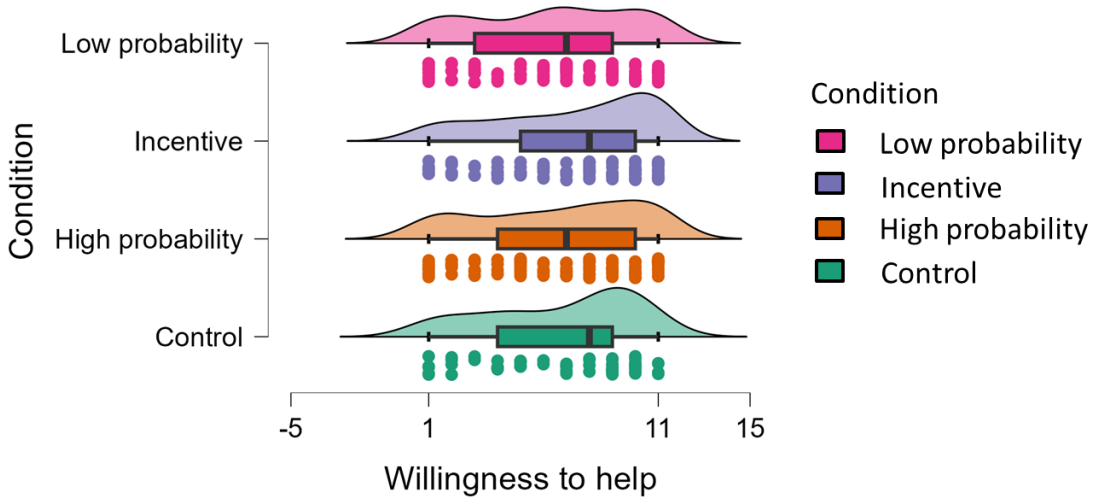
Table 1

Descriptives of Willingness to Help Broken by Conditions

Condition	N	Mean (SD)	Coefficient of variation
Control	57	6.75 (3.20)	.47
Incentive	111	7.30 (3.36)	.46
Low probability	114	6.36 (3.41)	.54
High probability	114	6.65 (3.45)	.52

Figure 1

Plot "Willingness to Help" Distribution Within Each Condition



Note. This figure shows the distribution of willingness to help depicted on a scale of 1 to 11 (points -5 & 15 added to simplify reading of the density plot pattern). The dots represent the data points of each participant, while the boxplot and density plot show the pattern of distribution in each condition.

Gender and Anxiety

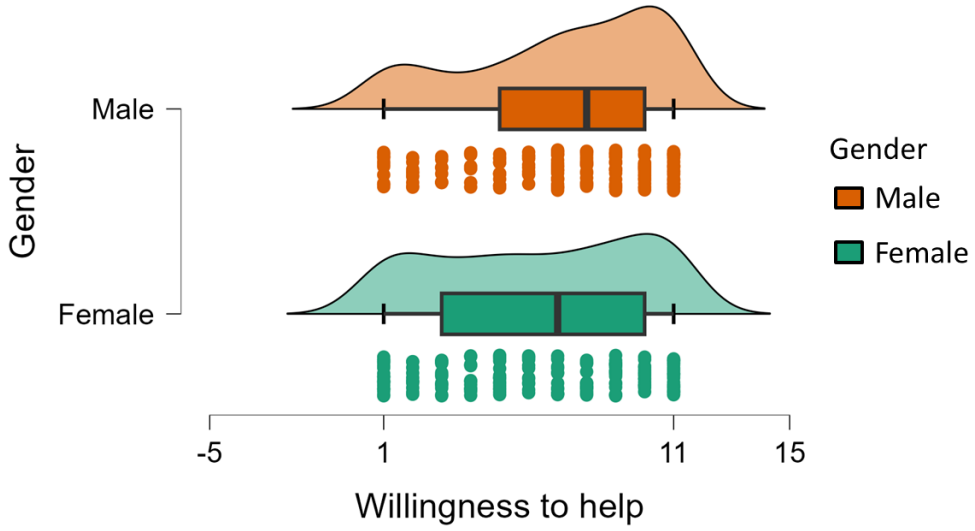
A correlation analysis was performed between willingness to help and anxiety score. Among the participants, the anxiety score and willingness to help were found to be significantly correlated positively, albeit the correlation is relatively small $r(395) = .11$, $p = .036$. This indicates that an increase in anxiety should increase the willingness to help.

Next, willingness was assessed based on gender. First, the test assumptions for gender were checked. Levene's test was non-significant ($F(359) = 2.23$, $p = .094$), indicating that the assumption of homogeneity of variance was not violated. Normality was checked with a Shapira-Wilk test of normality (female: $W(359) = .91$, $p < .001$; male: $W(359) = .89$, $p < .001$). This indicated that the assumption of normality was not met, thus I used a Mann-Whitney U test that states that the location parameter of the gender groups is the same regardless of the underlying distribution. The U test indicated that there was a significant difference between the willingness to help of females and males ($U(359) = 14094.00$, $p = .026$), see Figure 2.

To further investigate the relationship between gender and willingness to help a Two-way ANOVA was performed to identify a possible interaction between gender and the conditions. The test revealed that there was not a statistically significant interaction between the effects of condition and gender ($F(3, 353) = .328$, $p = .805$). Simple main effects analysis showed that being in different incentive conditions, and being a male or female did not have a statistically significant effect on the willingness to help another ($p = .244$). Simple main effects analysis showed that being a male or female did have a statistically significant effect on the willingness to help another ($p = .015$).

Figure 2

Effect of Gender on Willingness to Help



Note. This figure demonstrates the distribution of willingness to help depicted on a scale of 1 to 11 (points -5 & 15 added to simplify reading of the density plot pattern). The dots represent the data points of each participant, while the boxplot and density plot aid in the understanding of the distribution by showing the pattern of distribution between genders.

Overall, the level of anxiety seems to increase the willingness to help, and gender seems to play a noteworthy role in the sense that women are less willing to help a stranger than men (Figure 2).

Discussion

In this study, the aim was to use probabilistic incentives to influence the willingness to help. It was hypothesized that participants would rate their willingness to help as high when presented with a plausible deniable incentive, compared to being presented with a certain incentive. The results revealed that there were no differences between the

conditions (control, incentive, high probability, low probability). Contrary to the hypothesis, willingness to help does not increase when participants receive a probabilistic incentive. The results contradict the expectation that when a reward is uncertain the willingness to help should increase (Bolton et al., 2020; Silver & Silverman, 2022). Therefore, this result cannot build on existing evidence of the use of plausible deniability. It might have been the case that participants felt that being surely compensated for the task was not an act of self-interest but rather a fair compensation for their effort. This could explain the fact that there was no difference detected between the conditions (Titmuss 1998; Mellström & Johannesson, 2008).

Second, the study explored the influence of anxiety levels and gender on willingness to help. I examined how anxiety and gender affect willingness to help. It was hypothesized that participants with high levels of anxiety would be less willing to help someone else and that women would be less likely to help than men. Results revealed that the level of anxiety influences willingness to help. A relatively small positive correlation was found between anxiety and willingness to help which depicts increased levels of motivation to engage in prosocial behaviour when anxiety is present, this contradicts the findings that anxious people are less likely to engage in prosocial behaviour (Grecucci et al., 2013). Grecucci et al., suggest that anxious people are less likely to engage in social confrontation, so in the vignette used to measure willingness to help it might have been the case that anxious people respond differently to hypothetical scenarios compared to real-life social confrontation. For example, based on the current result regarding anxiety, residents who are dispositionally anxious individuals might consider recycling because their anxiety endorses them to act prosaically, thus it would be possible for the government

to induce anxiety, but if this is ethical is beyond the scope of this study. Although the correlation is small, anxiety might have some effect on decision-making.

Third, results revealed that men and women had different scores on willingness to help; females had a lower willingness to help another person than males. In line with the hypothesis, women were indeed less likely to help than men. This result is not in line with the theory stating that women are more caring and orientate to responsibility towards others (Eagly & Crowley, 1986). An explanation for this could be that the vignette used to measure willingness to help consisted of a story in which a person needs to help another move a sofa. This might seem like a task that involves stereotypically masculine skills and a task that could be seen as risky (Eagly & Crowley, 1986; Sarin & Wieland, 2016). Thus, it could be the case that women refrain from helping because of the notion that women are risk averse and they would rather not engage in tasks that are risky and seen as more masculine (Sarin & Wieland, 2016). In the case of the government, recycling should be framed as a task that anyone could do regardless of gender. The local government could for example depict a diverse set of people doing their recycling in an advertisement.

Overall, the effect of incentives depends on the context. When individual differences, such as anxiety, are present altruism can increase. Gender also plays a role in how willing a person is to perform a task, regardless of a certain or probabilistic incentive. Institutions such as governments should take these factors into account when deciding whether policies could increase cooperation between individuals. I suggest that an interesting factor for further research could be to delve into the topic of gender and categorizing effortful tasks as masculine or more feminine to see whether individuals of different genders are more willing to help another person doing an effortful task.

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