

## Signaling benefits of partner choice decisions

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### **Abstract**

When deciding whom to choose for a cooperative interaction, two features of prospective partners are especially relevant: Ability to provide benefits, and willingness to provide those benefits. Often, these traits are correlated. But, when ability and willingness are in conflict, people often value willingness over ability, even when doing so results in immediate losses. Across 11 studies (9 pre-registered) we explore one way of explaining this seemingly irrational choice, demonstrating that those who choose willing over able partners gain reputational and cooperative benefits themselves. We demonstrate that choosing a willing over an able partner affords one a moral reputation, makes one more likely to be chosen as a cooperation partner, and adheres to expectations for how a moral person will behave. In fact, even people who choose an able over a willing partner for themselves prefer others who choose a willing over an able partner. Crucial to our conceptual model, we find that valuing willingness over ability is an honest signal of both higher levels of generosity in economic games and lower levels of trait Machiavellianism. We also demonstrate that people's judgments of choosers are influenced by a host of important moderating factors. These findings provide the first extensive exploration of the signaling benefits of partner choice decisions. Furthermore, this work provides one explanation for why we choose those who are willing over those who are able, even at a cost to ourselves: By doing so, we in turn look like good potential partners.

*Keywords:* signaling; partner choice; cooperation; morality; evolution

## Introduction

Humans are a remarkably cooperative species, interacting with distant others and non-kin. The success of these cooperative interactions is an area of active interest (Boyd & Richerson, 1992, 2005; Henrich, 2015; Henrich & Henrich, 2007; Richerson & Boyd, 1998; 2005). One mechanism for building and maintaining cooperative interactions is partner choice: We choose the best partners and avoid those who are bad (Bull & Rice, 1991; Baumard, Andre, Sperber, 2013; Barclay, 2016; Barclay & Willer, 2007; Fu, Hauert, Nowak, & Wang, 2008; Noë & Hammerstein, 1994; for a review see Martin, Young, & McAuliffe, 2019). Often, the best partner is someone who is *able* to deliver resources or benefits. However, individuals sometimes choose to forgo partnering with able individuals and instead partner with those who are most *willing* to provide benefits, even when this choice carries an immediate cost (Barclay, 2016; Eisenbruch & Roney, 2017; Hackel, Doll, & Amodio, 2015; Macfarlan & Lyle, 2015; Raihani & Barclay, 2016). What explains this seemingly irrational choice? We provide one explanation: Such decisions carry signaling benefits.

Preferences for *able* partners (i.e. a partner who possesses valued personal traits—such as wealth, health, or high status in other forms—which grant the ability to benefit others) are found across both large- and small-scale societies, where people who exhibit the ability to deliver benefits receive both social and material benefits in return (Eisenbruch & Roney, 2017; Eisenbruch, Grillot, Maestriperi, & Roney, 2016; Gurven, Allen-Arave, Hill, & Hurtado, 2000; Macfarlan & Lyle, 2015). For example, those who signal their wealth through conspicuous consumption are more likely to be hired and obeyed (Nelissen & Meijers, 2011), and men with higher earning capacity are more likely to be chosen as a romantic partner by women (Buss, 1989). Those who appear healthy are more likely to be trusted (Krupp, DeBruine, & Jones,

2011), and those who are skilled are more likely to receive deference (Henrich & Gil-White, 2001). Preferences for ability extend to other species as well, with both rats and fish preferring to cooperate with able others (Vail, Manica, & Bshary, 2014; Dolivo & Taborsky, 2015).

At the same time, exhibiting a *willingness* to cooperate (i.e. actual or expressed willingness to reciprocate or participate in mutually beneficial endeavors) also affords many social and material benefits. In hunter-gatherer populations, generous hunters are favoured as hunting partners, often over the most skillful hunters (Bird & Power, 2015; Bird, Scelza, Bird, & Smith, 2012). In agriculturalist societies, those who are seen as more cooperative also tend to have a greater number of social connections (Lyle & Smith, 2014; Macfarlan, Quinlan, & Remiker, 2013; Macfarlan, Remiker, & Quinlan, 2012). In online markets, sellers with a reputation of being honest are more likely to be patronized over those who lack such a moral reputation (Diekmann, Jann, & Przepiorka, 2014). In economic games, many people prefer to partner with those who previously behaved fairly over those who have the most money (Hackel, Doll, & Amodio, 2015; Raihani & Barclay, 2016). And, comparing preferences for friends (Vigil, 2007), employment opportunities and work teams (van Prooijen & Ellemers, 2014), roommates, business partners, and romantic partners (Kafashan, 2017), reveals that a high level of willingness is valued more than a high level of ability. This valuing of willingness also extends to other species, with both chimpanzees and certain bird species showing a preference to cooperate with those who are altruistic (Russell & Dunbar, 2005; Zahavi & Zahavi, 1997; but see Wright, 1997).

It is perhaps not surprising that people value both ability (e.g. wealth, popularity) and willingness (e.g. generosity, kindness) when choosing a cooperation partner. What may be more surprising is that, when forced to make a choice between ability and willingness, some people

forgo the opportunity to partner with an able partner in favor of a partner who appears more willing, even when they know they will likely benefit more, in material terms, from partnering with the able partner (Barclay, 2016; Eisenbruch & Roney, 2017; Hackel, Doll, & Amodio, 2015; Macfarlan & Lyle, 2015; Raihani & Barclay, 2016). For example, across such research, a sizable proportion (sometimes the majority and sometimes a large minority) of participants choose to partner with those who give a larger share of what they have rather than those who give more in absolute terms (but a smaller share of what they have). Why would people choose willing partners when the expected economic payoff of choosing able partners is greater? This behavior is even more puzzling given that generosity appears to be an unstable trait within an individual (although perhaps more stable than ability; Eisenbruch & Krasnow, 2019) that varies greatly depending upon the social context (Smith, Larroucau, Mabulla, & Apicella, 2018; but see, Peysakhovich, Nowak, & Rand, 2014). Thus, not only is the expected payoff less if one chooses a willing partner, but one cannot even be certain that a willing partner will continue to act willingly in future interactions.

### **Costly Signaling Theory**

In attempting to provide an account of why people make the costly decision to value willing over able partners, we consider an ultimate explanation for such preferences while also exploring proximate influences. Ultimate explanations can be distinguished from proximate explanations in that they attempt to answer the ultimate question of why certain behaviors exist rather than explaining the immediate mechanism driving such behavior (Tinbergen, 1963). In particular, we investigate what is being signalled when one chooses a particular partner. We posit that the costly decision to partner with a willing partner signals that the chooser is of sufficient moral quality to bear the cost of not partnering with the able partner (Barclay & Reeve, 2012;

Getty, 2006; Gintis, Smith, & Bowles, 2001; Grafen, 1990; Spence, 1973; Zahavi, 1975).

Because of this reputation, short-term costs are partly recouped when such choosers are themselves chosen more often by others (especially by others who are also more generous) as a cooperation partner, thereby affording the various fitness benefits of social connection. In the long run, these social (and associated material) benefits could help offset the cost of not partnering with the able partner. But why should choosing a willing over an able partner signal moral goodness? In other words, what are the strategic costs of out-of-equilibrium play that make it beneficial for moral types, but not immoral types, to choose willing over able partners? Costly signaling theory posits that the action producing the signal has to be differentially costly/beneficial for different types of individuals; the variance in costliness is what allows for it to serve as a signal (Gintis, Smith, & Bowles, 2001; Grafen, 1990; Roberts, 1998; Spence, 1973; Zahavi, 1975). More recent research has argued that a critical feature is that the cost of cheating or faking the signal needs to outweigh the benefits (Higham 2014; Szamado, 2012). Thus, in our framework immoral types should find it too costly to fake the signal of choosing a willing partner, while moral types should find it beneficial to engage in the costly act of choosing the willing partner. Why might this be the case?

We posit that immoral choosers are more likely to experience mutual defection in the long run with any partner they choose, and, as a result, a partner's ability to provide immediate benefits becomes far more relevant than their willingness to cooperate. In other words, it is not worthwhile for immoral choosers to gain a moral reputation by partnering with a willing partner because any partnership or reputation that an immoral chooser obtains will soon dissolve due to the immoral person's uncooperative behavior. The quick dissolution of a partnership with a willing partner, and the corresponding loss of reputation, coupled with the large opportunity cost

of not partnering with an able partner makes the payoff structure such that it is optimal for immoral choosers to choose able partners. Consequently, immoral choosers should opt to reveal their character through their partner choice.

On the other hand, for moral choosers, mutual defection is far less likely to occur and therefore willingness becomes more relevant due to their relationship being more likely to persist into the long run. Thus, the benefits for moral types of i) a long-term relationship with a willing partner and ii) being seen as moral and being chosen more often by others should outweigh the benefits of partnering with an able partner. The payoff structure is such that it is optimal for moral choosers to choose willing partners, and consequently moral choosers will opt to reveal their character through their partner choice. Hence, we posit that a separating equilibrium may exist where moral types value willingness over ability in their partners, and immoral types value ability over willingness in their partners.

To provide support for this conceptual model, in the following studies, we experimentally examine whether those who choose willing partners actually behave more generously in economic games (specifically the Dictator Game) and score lower on psychometric measures of immoral personality traits (i.e., Machiavellianism, narcissism, and psychopathy; Paulhus & Williams, 2002). We focus particularly on trait Machiavellianism because it is characterized by strategic manipulateness (Jones & Paulhus, 2014). Machiavellian individuals may initially appear to be attractive cooperation partners (Wilson, Near, & Miller, 1996), but over time their manipulative nature should lead to the deterioration of relationships (Lyons & Aitken, 2010). Indeed, previous research has shown that people who score high on trait Machiavellianism report having lower quality friendships (Lyons & Aitken, 2010) and also report that a person's level of intelligence, physical attractiveness, or high social status (i.e. ability traits) are good reasons to

choose someone as a friend (Jonason & Schmitt, 2012). Furthermore, previous research has also shown that partnerships between a person low on trait Machiavellianism and a person high on trait Machiavellianism tend to lead to particularly poor outcomes on a cooperation task (Fry, 1985).

If costly signaling theory accounts for the tendency to value willingness over ability when selecting partners, a tendency to choose willing partners should be linked to one's own generosity and moral personality. Furthermore, if such individuals are more likely to be generous and less likely to be immoral, this would support the idea that these individuals' relationships may be more likely to persist into the future, creating greater incentives for moral types to choose willing over able partners. To further substantiate this point, we also examine whether there is an increased preference for willing partners when people are considering long-term versus short-term relationships. Furthermore, costly signalling theory would also suggest that people should use partner choice to signal certain traits. Thus, we also examine i) whether people are aware of what is being signaled via their partner choice decisions, ii) whether people experience signaling concerns after choosing certain partners, and iii) whether people are sensitive to varying reputational incentives when making partner choice decisions.

Finally, we argue that our results cannot simply be explained by homophily—that people partner with those who are like them. We provide evidence that people use partner choice to signal certain traits, experience different reputational concerns after choosing different partners, anticipate reputational costs for choosing certain partners, and gain reputational and partner choice benefits for choosing willing partners even from those who prefer able partners. Although it is undoubtedly true that similarity between partners tends to increase the likelihood of a relationship lasting (Antal et al., 2009; Hammond & Axelrod, 2006; McElreath, Boyd, &

Richerson, 2003; McPherson, Smith-Lovin, & Cook, 2001; Riolo, Cohen, & Axelrod, 2001) the evidence we provide in the following studies suggests that signaling contributes to people's partner choice decisions.

### **Ability and Willingness**

We follow previous research (e.g., Kafashan, 2017) by defining ability as having the resources to benefit others (e.g., athleticism, appearance, creativity, intelligence, popularity, wealth) and willingness as showing an inclination to benefit others (e.g., cooperativeness, friendliness, generosity, helpfulness, kindness, trustworthiness). Across most of our studies, we operationalized a willing partner as one who is relatively poor yet relatively generous and an able partner as one who is relatively rich yet relatively selfish (Raihani & Barclay, 2016). But we also operationalized a willing partner as one who is kind yet unpopular and as one who generous yet less skilled, and we operationalized an able partner as one who is popular yet unkind and skilled but not generous. This comparison between willingness and ability follows previous research across various contexts that contrasts these two dimensions (Barclay, 2013, 2016; Cosmides, Guzman, & Tooby, 2019; Gangestad & Simpson, 2000; Macfarlane & Lyle, 2015; Martin, Seta, & Crelia, 1990; Raihani & Barclay, 2016; Smith & Apicella, 2019; Smith & Apicella, 2020; Vigil, 2007; Zabatany, Conley, & Pepper, 2004). With that said, this comparison does relate to other distinctions in social and personality psychology between agency/competence and communion/warmth (Abele, Cuddy, Judd, & Yzerbyt, 2008; Abele & Wojciszke, 2007; Digman, 1997; Fiske, 2012; Fiske, Cuddy, & Glick, 2007; Judd, James-Hawkins, Yzerbyt, & Kashima, 2005; Wiggins, 1991). We view such terms as relating to the same fundamental concepts: having a disposition to either help or harm versus having the ability to either help or harm (Brambilla,

Rusconi, Sacchi, & Cherubini, 2011; Brambilla, Sacchi, Rusconi, Cherubini, & Yzerbyt, 2012; Goodwin, Piazza, & Rozin, 2014; Leach, Ellemers, & Barreto, 2007).

## **General Methods**

### *Ethics Statement*

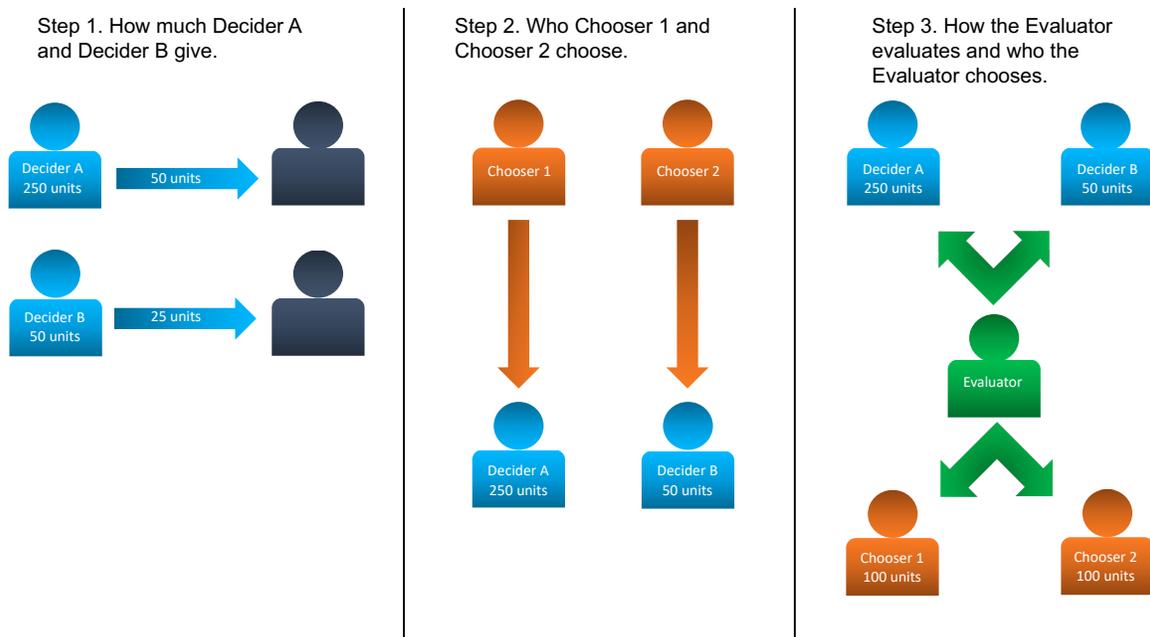
All studies were approved by the Ethics Committee of XXXX (blinded for review) with the IRB protocol number: 12.064.

### *Procedure*

We investigated the roles of willingness and ability principally in the Dictator Game (DG). In Studies 2, 4, and 5 participants played an incentivized DG, in which participants earned a bonus payment depending upon their choice. In Studies 1, 3, 6, 8, 9, and 10 participants read about the behavior of other people in the DG and were asked to make evaluations of such people. Additionally, in Studies 7, 9, and 11 we extrapolated the general features of the DG to real-world vignettes, namely when choosing business partners and social partners.

The specific steps of the DG were as follows. Note that only Study 2 entailed participants performing all of these steps in a fully incentivized experiment. In the majority of our studies we only had participants play the role of Evaluator while imagining the behavior of the other players (Deciders and Choosers) and making judgments of them based on their decisions in the game. Participants began by reading instructions for the DG, consisting of a single decision: The Decider has a sum of money and can choose how much of that money to share with the Receiver. Participants were then introduced to two Deciders and told that in a previous game one of these Deciders (able) had 250 monetary units and chose to share 50 monetary units with the Receiver, while the other Decider (willing) had 50 monetary units and chose to share 25 monetary units with the Receiver (see Step 1 in Figure 1). This ratio of monetary units follows previous research

comparing ability and willingness (Raihani & Barclay, 2016). It is important to note that the willing partner is only relatively less able, not completely incapable. These two Deciders were then presented to participants with the able Decider again having 250 monetary units and the willing Decider having 50 monetary units (see Step 2 in Figure 1). Choosers were then asked to choose which Decider they would like to have as their Decider in a one-shot interaction. Other participants (Evaluator in the Figure 1) were asked to choose and evaluate both the original Deciders from Step 1 as well as the Choosers who chose one of the Deciders in Step 2 (see Step 3 in Figure 1). In Study 1, the monetary units were dollars, and in all subsequent studies the monetary units were cents.



*Figure 1.* Graphical depiction of the three primary steps across studies.

To reiterate our conceptual model, we posit that the benefits for Chooser 2 of i) a long-term relationship with a willing partner (Decider B) and ii) the reputational and partner choice benefits from observers (Evaluator) outweigh the benefits of partnering with an able partner

(Decider A), thus making it optimal for Chooser 2 to value willingness over ability. On the other hand, due to Chooser 1's immoral character, a relationship with a willing partner (Decider B) and the resulting positive evaluations from observers (Evaluator) would rapidly dissolve, thus making the immediate attainment of maximum utility from an able partner (Decider A) the optimal choice.

#### *Exclusion criteria*

Studies 3 through 11 included preregistered exclusion criteria (links provided in *Methods* section of each study). Excluded from data analysis were non-native English speakers, participants who reported paying low attention to the study (rating below 6 on a 7-point scale), participants who reported providing little or no thought to more than one question on the survey, participants who failed the comprehension check, and participants whose average response times fell below three SD's of the log-transformed overall mean.

#### *Data availability*

All data and study materials are available at Open Science Framework: xxxx (masked for review).

### **Study 1**

We began by asking whether participants prefer to partner with those who choose willing versus able partners, and whether this pattern is moderated by participants' own preferences for willing versus able partners. The decisions of which partners to choose in this study were hypothetical.

#### *Methods*

A total of 87 participants (45% Male; Mean age = 20.11,  $SD = 1.16$ ) from a large North American university were recruited to participate. Participants were told about two Deciders:

One Decider (able) who had \$250 and chose to transfer \$50 in a previous interaction, and another Decider (willing) who had \$50 and chose to transfer \$25 in a previous interaction. Participants were then asked 1) to choose which Decider they would like to have as their Decider in a new DG (in which the participant would be the Recipient), and 2) to rate both Deciders on how trustworthy and moral, how emotional and logical, and how warm and competent they seemed. The order in which the decider choice and ratings were made was randomized. Next, participants were told about two other participants who were given the same choice they were just given. One participant (i.e. Chooser) chose the able Decider (who transferred \$50 out of \$250), and the other participant (i.e. Chooser) chose the willing Decider (who transferred \$25 out of \$50). Participants were then asked 1) to choose which of these two Choosers they would like to have as their Decider in a new DG where each of the two Choosers would have \$100 (and the participant would be the Recipient), and 2) to rate both Choosers on a 7-point scale (1 = “not at all” to 7 = “extremely”) on how trustworthy, moral, emotional, logical, warm, and competent they seemed.

### *Results*

We first examined participants' own preferences for Decider in the DG. Participants were more likely to choose to partner with an able Decider (66%) over a willing Decider (34%),  $\chi^2(1) = 8.38, p = .004, w = .31$ . At the same time, participants rated the able Decider as less trustworthy, moral, emotional, and warm, but more logical and competent, suggesting that moral character ratings and partner choice decisions can sometimes diverge (see Supplementary Table 1a for statistical details; see Figure 2 for graphical depiction).

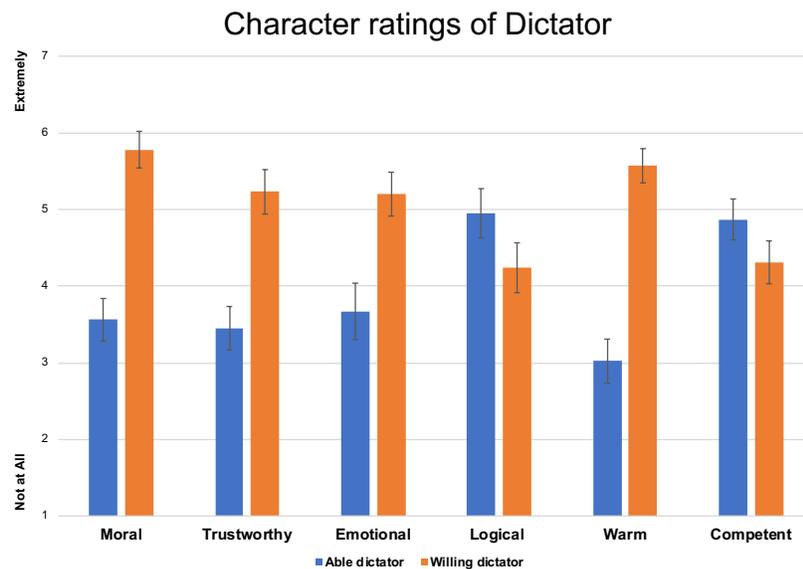
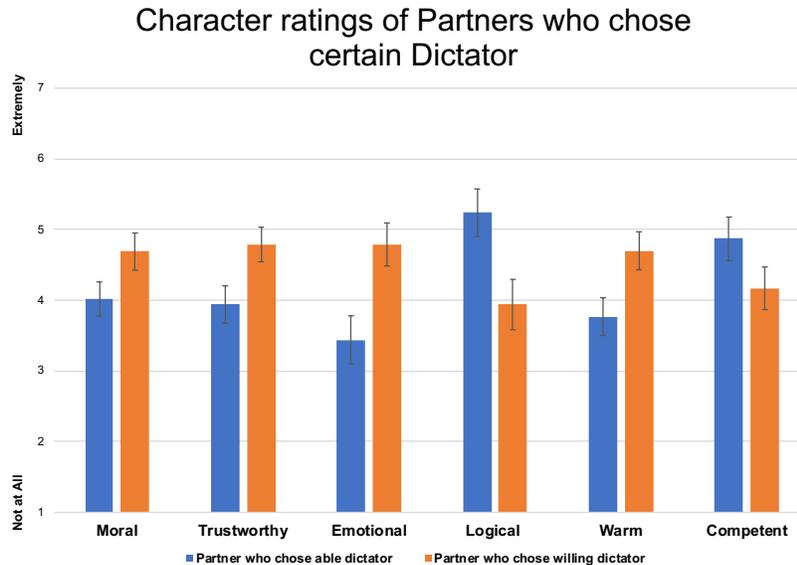


Figure 2. Inferences about character traits of able and willing dictator.

Next, we examined participants' second-order decisions: their decision of which Chooser they want to be the Decider for a DG after learning who that individual previously chose as a partner. Here, opposite to their first-order decisions, participants were more likely to choose someone who chose a willing Decider (68%) over an able Decider (32%),  $\chi^2(1) = 11.05$ ,  $p = .001$ ,  $w = .36$ . Participants also rated those who chose a willing Decider as more trustworthy, moral, emotional, and warm, but less logical and competent (see Supplementary Table 1b for statistical details; see Figure 3 for graphical depiction).

Among the participants who chose the willing Decider for themselves, they preferred to partner with the Chooser who also chose willing Deciders (70% to 30%),  $\chi^2(1) = 4.80$ ,  $p = .03$ ,  $w = .40$ . These participants also rated Choosers who chose willing Deciders as more moral, trustworthy, emotional, and warm, but less logical and competent (see Supplementary Table 1c for statistical details). The participants who chose the able Decider for themselves also preferred to partner with Choosers who instead chose the willing Decider (67% to 33%),  $\chi^2(1) = 6.33$ ,  $p =$

.01,  $w = .33$ . Those who chose able Deciders for themselves also evaluated Choosers who chose the willing Decider as being more emotional and warm and also marginally more moral but less logical than Choosers who chose the able Decider (see Supplementary Table 1d for statistical details).



*Figure 3.* Inferences about character traits of those who chose either the able or willing dictator.

### *Discussion*

Study 1 provides the first evidence, to our knowledge, of a signaling effect of partner choice decisions: Those who choose to partner with a willing partner over an able, selfish partner are in turn more likely to be selected as interaction partners. Furthermore, choosing a willing partner can signal superior character traits, such as trustworthiness, warmth and moral character. This result is not merely due to a homophily, whereby people value those who make similar decisions as theirs. To the contrary, we find that the majority of people choose to partner with an able Decider but prefer others who choose to partner with a willing Decider. And, this preference

for those who choose to partner with a willing Decider holds among individuals who themselves chose to partner with an able Decider.

This is not to say that choosing to partner with a willing Decider has only positive signaling value. We find that, while those who chose willing over able partners are rated as more trustworthy, moral, emotional, and warm, they are also rated as less logical and competent, which aligns with the fact that choosing the able partner is the utility maximizing choice. This pattern of results held regardless of participants' own partner choices, although the effects were statistically larger when the participant also chose a willing partner.

## **Study 2**

In Study 1, we find that those who choose to partner with willing Deciders over able Deciders are themselves more likely to be picked for cooperative interactions. While this study has the advantage of being conducted in-lab, it has the disadvantage of being hypothetical, and so actual money for participants was not at stake. In Study 2, we address this concern by examining the second-order partner choice selection effect with an incentivised online experiment without deception, in which participants are asked to make real partner choice decisions with real money at stake.

### *Methods*

A total of 199 participants took part in this study. First, 100 workers (59% Male; Mean age = 36.20,  $SD = 10.60$ ) from Amazon Mechanical Turk were recruited to play the role of one of the Deciders in this study. These Deciders were asked to choose between an able or a willing Decider for themselves. Next, they were asked out of \$1.00 how much they would share if they were the Decider. Then, half were endowed with \$2.50 and asked whether they want to share 50 cents or 0 cents, and the other half were endowed with \$0.50 cents and asked whether they want

to share 25 cents or 0 cents. After this process was complete, a total of 99 workers (59% Male; Mean age = 36.20,  $SD = 11.13$ ) from Amazon Mechanical Turk were recruited to participate. Participants were informed that they could earn bonus money depending upon their decision in the experiment. After reading about the two Deciders (One Decider [able] who had 250 cents and chose to transfer 50 cents in a previous interaction, and another Decider [willing] who had 50 cents and chose to transfer 25 cents in a previous interaction), participants were asked to choose which Decider they would like to have as their Decider in a DG. Next, participants were told of two other participants who were given the same choice they were just given. One Chooser chose the Decider who had 250 cents and chose to share 50 cents in a previous interaction, and the other Chooser chose the Decider who had 50 cents and chose to share 25 cents in a previous interaction. Then, participants were asked to choose which of these two Choosers they would like to have as their Decider in a new DG (with the participant as the Recipient). Participants received bonus money according to the decisions made by the partner they selected for the two DGs they participated in.

### *Results*

Our results replicate the results from Study 1. Participants were more likely to choose to partner with an able Decider (69%) over a willing Decider (31%) for a DG,  $\chi^2(1) = 13.83, p < .001, w = .37$ . Despite this, they were more likely to choose to partner with someone who chose a willing Decider (72%) over an able Decider (28%),  $\chi^2(1) = 18.68, p < .001, w = .43$ .

### *Discussion*

In Study 2, we replicated the second-order partner choice selection effect with an online sample of participants playing a DG with real partners and with real money at stake. Taken together, Studies 1 and 2 provide initial evidence of the potential functional benefits of choosing

to partner with those who are willing over those who are able, even when this leads to an immediate material loss. Although the immediate material payoff may be superior when partnering with a wealthy partner, the reputational and cooperative benefits appear to be superior when partnering with a willing partner.

### **Supplementary Studies 3, 4, and 5**

In Study 3, we explore the expectations people have for how moral and immoral individuals make partner choice decisions. The results showed that people expect moral people to value willingness over ability, and immoral people to value ability over willingness when making partner choice decisions. In Study 4, we find that those who chose willing over able partners were more generous in the DG, suggesting that partner choices serve as an honest signal of generosity. This finding is the first evidence of partner choice decisions serving as an honest signal of moral character traits. The results from Study 5 replicated the honest signalling effect seen in Study 4. Furthermore, a pooled analysis of all transfer decisions across Studies 2, 4, and 5 showed that those who choose willing over able partners act more generously in the DG (see Supplementary Materials for full study details).

### **Study 6**

In Study 6, we explore how people who choose willing versus able partners evaluate their own partner choice decisions and how these evaluations align with the actual judgments by evaluators. This is central to our costly signalling framework given that signaling theories imply adaptations in the psychology of both the receiver and the sender. Our previous studies have demonstrated functional design in the psychology of receivers, and here we examine whether senders of such signals are aware of the signal they are sending.

Specifically, we examine:

- a) choosers' self-evaluation of their partner choice
- b) choosers' expectations for how evaluators will judge them based on their partner choice
- c) alignment between choosers' self-evaluations and their expectations of evaluator judgments
- d) alignment between people's self-evaluations and actual evaluator judgments
- e) alignment between people's expectations of evaluator judgments and actual evaluator judgments

Drawing on previous research showing that those who are more cooperative rely more on emotion in their decision-making (Levine et al., 2018; Rand, Greene, & Nowak, 2012), we predict that people who choose willing partners may report relying more on emotion rather than reason. We follow a similar method as Levine et al., (2018) by relying on self-report to probe how subjects arrived at their decisions. This method of course comes with the limitation that people may never be fully aware of how they arrived at their decisions (Nisbett & Wilson, 1977). We follow previous work in this area by examining how people *believe* they arrived at a particular decision.

### *Methods*

A total of 601 workers from Amazon Mechanical Turk were recruited to participate. A total of 80 participants (13.3%) were excluded based on preregistered exclusion criteria. This left data from a total of 521 participants (49% Male; Mean age = 38.81,  $SD = 12.42$ ) to be analysed.

Participants were assigned to one of six conditions in this study. In one condition, participants were asked to choose between an able or a willing Decider while being told that their decision would be kept *private* from other workers who could choose to partner with them. In a

second condition, participants were asked to choose between an able or a willing Decider while being told that their decision would be made *public* to other workers who could choose to partner with them. In both of these conditions, participants were asked, after making their partner choice to 1) evaluate their own decision and 2) predict how others would evaluate them if they were to see their decision. The order in which they answered these two sets of questions was randomized. In the four other conditions, participants were assigned to evaluate another worker who chose either a willing or an able partner, and made their decision in public or private.

Across all six conditions, participants evaluated either themselves or another worker on the following items on a 7-point scale (1 = “not at all” to 7 = “extremely”): how much the decision was based on feelings and emotions, how much the decision was based on logical reasoning, perceived personal warmth, perceived personal competence, how praiseworthy was the choice, how blameworthy was the choice, how much they/the other worker cares about fairness, and how morally correct was the choice. Before conducting this study, methods, hypotheses, and analysis plans were pre-registered and can be accessed at:

<http://aspredicted.org/blind.php?x=g8dq76>

### *Results*

Participants preferred the able decider in the public condition (70% vs. 30%),  $\chi^2(1) = 13.44, p < .001, w = .40$ , as well as in the private condition (72% vs. 28%),  $\chi^2(1) = 16.11, p < .001, w = .44$ .

Compared to people who chose the able decider, people who chose the willing decider reported that they made their decision based more on feelings and emotions (see Supplementary Table 3a for statistical details)  $t(169) = 5.10, p < .001, d = .74$ , and based less on logic,  $t(169) = 2.14, p = .03, d = .34$ . They also reported being more competent  $t(169) = 2.47, p = .02, d = .42$ ,

reported their choice as being more praiseworthy  $t(169) = 2.63, p = .009, d = .44$ , and less blameworthy  $t(169) = 2.30, p = .02, d = .39$ , and more morally correct  $t(169) = 3.04, p = .003, d = .51$ , and reported caring more about fairness  $t(169) = 3.19, p = .002, d = .56$ . These results did not vary depending on whether the decision was made in public or private (lowest interaction value,  $p = .34$ ).

Compared to people who chose the able decider, people who chose the willing decider expected others to see them as being guided more by feelings and emotions (see Supplementary Table 3b for statistical details)  $t(169) = 4.35, p < .001, d = .72$ , as being more warm  $t(169) = 4.86, p < .001, d = .83$ , and competent  $t(169) = 2.55, p = .01, d = .44$ , as being more praiseworthy  $t(169) = 3.32, p = .001, d = .54$ , and less blameworthy  $t(169) = 3.35, p = .001, d = .58$ , and more morally correct  $t(169) = 5.57, p < .001, d = .95$ , and as caring more about fairness  $t(169) = 5.68, p < .001, d = .97$ . These results did not vary depending on whether the decision was made in public or private (lowest interaction value,  $p = .08$ ).

Among participants who chose the able partner, their evaluations of their own decision and predictions for how others would evaluate them differed (see Supplementary Table 3c). These participants expected to be seen as less logical, warm, competent, willing, and moral, and more blameworthy than they believed themselves to be. Among participants who chose the willing partner, their evaluations of their own decision and predictions for how others would evaluate them only differed on two variables (see Supplementary Table 3d). These participants expected to be seen as less competent and as caring less about fairness than they believed themselves to be. Otherwise, they expected others to perceive them as they perceived themselves.

There were significant interactions between people's own evaluations of their partner choice decision and other people's evaluation of their partner choice decisions on a number of dependent variables (see Supplementary Table 3e). People believed that they were marginally more competent for choosing the willing partner, but observers disagreed, seeing those who chose the able partner as marginally more competent,  $F(1, 517) = 6.93, p = .009, \eta p^2 = .01$ . Although people saw themselves as caring less about fairness by choosing the able partner, they anticipated less of a reputational cost than they actually incurred,  $F(1, 517) = 8.19, p = .004, \eta p^2 = .02$ .

There were also significant interactions between people's expectations for how they would be evaluated by others and how other people actually evaluated them on a number of dependent variables (see Supplementary Table 3f). Participants who chose the able partner made accurate predictions as to how warm they would seem to others, but participants who chose the willing partner predicted that they would be seen as much warmer than observers actually perceived them to be,  $F(1, 517) = 4.44, p = .04, \eta p^2 = .009$ . Similarly, participants who chose the able partner made accurate predictions as to how competent they would seem to others, but participants who chose the willing partner predicted that they would be seen as much more competent than observers actually perceived them to be,  $F(1, 517) = 8.38, p = .004, \eta p^2 = .02$ . Interestingly, participants also predicted that they would be seen as more competent by choosing the willing partner, but they were actually seen as more competent by choosing the able partner,  $F(1, 517) = 8.38, p = .004, \eta p^2 = .02$ .

There were also main effects such that those who chose the willing decider were seen by participants as more emotional,  $F(1, 394) = 21.04, p < .001, \eta p^2 = .05$ , less logical,  $F(1, 394) = 7.27, p = .007, \eta p^2 = .03$ , more warm,  $F(1, 394) = 21.45, p < .001, \eta p^2 = .05$ , more praiseworthy,

$F(1, 394) = 13.79, p < .001, \eta p^2 = .03$ , less blameworthy,  $F(1, 394) = 5.03, p = .03, \eta p^2 = .02$ , more morally correct,  $F(1, 394) = 33.41, p < .001, \eta p^2 = .07$ , and as caring more about fairness,  $F(1, 394) = 96.17, p < .001, \eta p^2 = .20$ . These results did not vary depending on whether the decision was made in public or private.

### *Discussion*

Our results reveal important differences between people who choose willing versus able partners. Notably, we find evidence that the people who choose willing partners expect others to see them in a more positive light. This serves as evidence that people not only gain reputational benefits for choosing willing partners but are able to accurately predict such reputational benefits. Furthermore, not only are people who choose willing partners more generous in the DG, as shown in Studies 2, 4, and 5, but as seen here in Study 6 such individuals also report caring more about fairness. People who choose willing partners also feel that they are worthier of praise. Importantly, this seems to not lead to a licensing effect but rather a consistency effect, given their subsequent generosity in the DG. Also, the fact that those who choose willing partners report relying more on emotion aligns with previous research showing that those who rely on emotion over reason in economic games are more likely to cooperate (Levine et al., 2018; Rand, Greene, & Nowak, 2012). Finally, people who choose able partners expect others to misjudge them based on their choice, while people who choose willing partners expect others to judge them accurately.

Our results also reveal that people by and large have an accurate impression of the signal they are sending via their partner choice. This is what would be expected given our conceptual model. With that said, people do make some mispredictions about how they are seen by others. Those who chose willing partners believed themselves to be, and expected others to see them as,

more competent than people judge them to be. These participants also expected others to see them as being warmer than they actually were seen to be. Meanwhile, people who chose able partners believed themselves to be fairer than others actually judged them to be, and also under-predicted the reputational cost that they would incur by choosing an able partner. This serves as the first examination of the accuracy of meta-judgments within the domain of partner choice.

Consistent with the results of Study 5, we again found a null effect of social visibility (although again the able partner was chosen slightly, albeit non-significantly, more in private). Furthermore, participants' evaluations of both their own and other people's choice of a partner were not influenced by social visibility. This suggests that partner choice decisions may be robust to cues of social visibility, though further exploration across other contexts is needed.

### **Study 7**

We demonstrated in Study 6 that people are aware of the signal their partner choice decisions send, thus suggesting functional design in the psychology of the signaler. In Study 7 we build upon this evidence by examining whether people employ this understanding by shifting their partner choice decisions as a result of different reputational incentives present in their environment. In other words, we ask: is partner choice sensitive to different injunctive norms? Given that our previous studies have shown that choosing willing partners signals warmth and morality and choosing able partners signals competence and logicity, we examine whether incentives to appear warm and moral increase the rate of choosing willing partners and, on the flip side, whether incentives to appear competent and competitive increase the rate of choosing able partners.

We further investigate our conceptual model by testing whether people's preference for ability versus willingness in prospective partners shifts depending on whether they are choosing

a partner for a short-term versus long-term relationship. Finally, we examine the generalizability of our evidence of honest signaling by measuring whether those who choose willing over able partners score lower on the Dark Triad (Paulhus & Williams, 2002) of personality traits: Machiavellianism (Christie & Geis, 1970), narcissism, and psychopathy (Jones & Paulhus, 2014).

### *Methods*

A total of 402 workers from Amazon Mechanical Turk were recruited to participate. A total of 102 participants (25.4%) were excluded based on preregistered exclusion criteria. This left data from a total of 304 participants (55% Male; Mean age = 38.67,  $SD = 11.42$ ) to be analysed.

Our study consisted of a 2x2 between-subjects factorial design. Participants were randomly assigned to imagine being interviewed for a job they really want at either an investment bank or a non-profit organization. Participants were told that at the investment bank employers are looking to hire someone who is competitive, skilled, and ambitious, and at the non-profit organization employers are looking to hire someone who is compassionate, caring, and ethical. Participants were then told that, as part of the interview, the interviewer would like to evaluate their decision on a partner choice task. Participants were randomly assigned to choose between an able or a willing partner for either a Dictator Game or a business deal. The business deal vignette consisted of a prospective business partner who has more money (i.e. is more able) but previously shared only 20% of the earnings (i.e. is less willing) with a prior business partner versus a prospective business partner who has less money (i.e. is less able) but previously shared 50% of the earnings (i.e. is more willing) with a prior business partner. The ratio of money was equivalent to the ratio described in the DG in Studies 1-6.

Our previous studies have showed that i) choosing a willing partner signals morality and warmth and choosing an able partner signal competence and logicity (Study 1) and ii) people are aware that they are sending such signals by choosing such partners (Study 6). Thus, we predict that when the incentives favor appearing competitive, skilled, and ambitious (i.e. the investment bank conditions) people will be more likely to choose the able partner in the DG and business partner vignette and when the incentives favor appearing compassionate, caring, and ethical (i.e. the non-profit organization conditions) people will be more likely to choose the willing partner in the DG and business partner vignette.

After choosing a partner, participants were then told that the interview was over, and they were asked to complete a modified measure of trait Machiavellianism (Christie & Geis, 1970), narcissism, and psychopathy (Jones & Paulhus, 2014). Before conducting this study, methods, hypotheses, and analysis plans were pre-registered and can be accessed at:

<https://aspredicted.org/blind.php?x=9fy8z6>

## *Results*

### *DG partner*

Participants who were assigned to the investment bank x DG condition (i.e. imagined they were being interviewed at an investment bank and were asked as part of the interview to choose a partner in a DG) chose the able dictator marginally more often than the willing dictator (able = 61% vs. willing = 39%)  $\chi^2(1) = 3.86, p = .05$ , but participants who were assigned to the non-profit x DG condition did not show a preference between the able versus willing dictator (able = 52% vs. willing = 48%)  $\chi^2(1) = .13, p = .72$ . The comparison between the two conditions was non-significant,  $p = .28$ .

### *Short-term business partner*

Participants who were assigned to the investment bank x business partner condition (i.e. imagined they were being interviewed at an investment bank and were asked as part of the interview to choose a partner in the business partner vignette) did not show a preference between the willing versus able partner for a short-term partnership (willing = 51% vs. able = 49%)  $\chi^2(1) = .06, p = .81$ , but participants who were assigned to the non-profit x business partner condition chose the willing partner more often than the able partner for a short-term partnership (willing 84% vs. able = 16%)  $\chi^2(1) = 35.56, p < .001$ . The comparison between the two conditions was significant,  $p < .001$ .

#### *Long-term business partner*

Participants who were assigned to the investment bank x business partner condition chose the willing partner more often than the able partner for a long-term partnership (willing = 91% vs. able = 9%)  $\chi^2(1) = 48.06, p < .001$ , and participants who were assigned to the non-profit x business partner condition also chose the willing partner more often than the able partner for a long-term partnership (willing = 87% vs. able = 13%)  $\chi^2(1) = 44.06, p < .001$ . The comparison between the two conditions was non-significant,  $p = .42$ .

#### *Time horizons*

Across both the investment bank and non-profit conditions, when participants chose a partner for a long-term relationship they valued willingness more compared to when they were choosing a partner for a short-term relationship (long-term = 89% vs. short-term = 68%),  $p < .001$ . We also find an interaction effect such that willingness was valued more for long versus short-term relationships in the investment bank condition (long-term = 91% vs short-term = 51%),  $p < .001$ , but in the non-profit condition the willing partner was valued similarly irrespective of time horizons (long-term = 87% vs short-term = 84%),  $p = .42$ . This suggests that

strong incentives to signal moral goodness may minimize the influence of time horizons on partner choice.

### *Honest signal*

Participants in the non-profit x business partner condition who chose the able over willing partner for a short-term partnership scored marginally higher on trait Machiavellianism, ( $M = 3.48, SD = .68$  vs.  $M = 3.11, SD = .74$ )  $t(77) = 1.70, p = .09, d = .52$ . Participants in the non-profit x business partner condition who chose the able over willing partner for a long-term partnership scored higher on both trait Machiavellianism, ( $M = 3.73, SD = .48$  vs.  $M = 3.09, SD = .74$ )  $t(77) = 2.70, p = .009, d = 1.03$ , and trait psychopathy ( $M = 3.52, SD = .69$  vs.  $M = 2.46, SD = .87$ )  $t(77) = 3.69, p < .001, d = 1.35$ . Finally, participants in the investment bank x business partner condition who chose the able over willing partner for a long-term partnership scored higher on trait Machiavellianism, ( $M = 3.73, SD = .24$  vs.  $M = 3.38, SD = .74$ ),  $t(16.94) = 2.67, p = .02, d = .63$ .

### *Discussion*

We observed a greater preference for the willing business partner for a short-term relationship when the incentive was to appear moral as opposed to competent. When the incentive was to appear competent, people showed no preference between the willing versus able business partner, but when the incentive was to appear moral people showed a strong preference for the willing partner. This suggests that people may shift their partner preference depending on immediate reputational incentives, using their partner choice to signal certain traits. It is also worth noting that in Study 11 (below) we ask participants to choose a business partner in this same business partner vignette while not manipulating reputational incentives. We find that the willing partner is chosen 68% of the time, which is 17% more than when they are incentivized to

signal competence (51% choose willing) and 16% less than when they are incentivized to signal morality (84% choose willing).

In the DG the preference for the able dictator disappeared when the incentive was to appear moral, but emerged when the incentive was to signal competence. We note, however, that the comparison between conditions was directional but non-significant. While reputational incentives appeared to have an effect on decisions about short-term partnerships, they did not affect long-term partnership decisions. Irrespective of the reputational incentives, people preferred the willing business partner for a long-term relationship. The fact that our manipulation of reputational incentives shifted choices for short-term but not long-term partnership may also quell any concerns that participant behavior in this study is simply due to demand effects. If demand effects were operating we would expect to see similar shifts regardless of whether the choice was for a short- or long-term partnership. Instead the results seem to suggest a genuine shift of preference based on reputational incentives when deciding on short term partners. When it comes to choosing long-term partners, individual differences may dominate situational factors.

Such individual differences may include personal moral orientation toward others: we found across multiple conditions that those who chose the willing over able partner score lower on trait Machiavellianism. This aligns with our theory that those who are more moral are more likely to have relationships that persist into the long run (because they are more likely to act cooperatively with others). As a result, these individuals recoup the costs of forgoing the immediate benefits of partnering with able others. Lending further support to our conceptual model, we found that people who are focused on choosing a partner for a long-term relationship show a greater preference for willingness over ability in their partner.

### **Supplementary Study 8**

In Study 8, after reading about an able and willing Decider for the DG, participants were asked to choose which Decider they would like to have as their Decider in a new DG. One third of the participants were informed that the majority of previous participants chose the able Decider, one third of the participants were informed that the majority of previous participants chose the willing Decider, and the final third of the participants were not provided with any such information and were simply asked to choose between the willing and able Deciders. The results from Study 8 suggest that partner choice decisions might be influenced by descriptive norms. (see Supplementary Materials for full study details).

### **Study 9**

In Study 9 we again examine the effect of descriptive norms on partner choice. The results of Study 8 were somewhat inconclusive as to the role that descriptive norms play. While we found different preferences for those who choose an able versus a willing Decider in our two descriptive norms conditions, this difference across conditions was not significant. In Study 9, we provide a replication and extension of this result.

To provide further evidence of adaptive design in the psychology of the signaler, we additionally examine whether people have different reputational concerns and anticipate different reputational costs after choosing able versus willing partners. If partner choice is a signal and not simply a cue, people should anticipate different signaling outcomes as a result of their partner choice. Relatedly, we also test whether people anticipate experiencing different emotions if others were to learn of their partner choice. We also examine whether certain people have different expectations of their partners, whether certain people exhibit different levels of hesitancy when choosing certain partners, and what people think of others who make similar partner choices. We investigate these questions across both the DG and a vignette describing two

farmers. We chose this farming vignette because it entails a common real-world situation where a person must choose between a more able versus more willing partner for a cooperation task.

Finally, we measure the Dark Triad (Paulhus & Williams, 2002) of personality traits:

Machiavellianism (Christie & Geis, 1970), narcissism, and psychopathy (Jones & Paulhus, 2014).

### *Methods*

A total of 651 workers from Amazon Mechanical Turk were recruited to participate. A total of 128 participants (19.7%) were excluded based on preregistered exclusion criteria. This left data from a total of 523 participants (54% Male; Mean age = 39.51,  $SD = 12.66$ ) to be analysed. There were six conditions in this study. Half of the participants were randomly assigned to choose a partner for the DG. The other half of participants were randomly assigned to choose a partner for a farming partnership. In the farm vignette participants read about two farmers that they could choose as a partner on their new farm. One farmer is the top farmer in the community and consistently produces record yields and record profits, but refuses to sell any of his produce at discounted prices to needy families. The other farmer is an average farmer in the community and produces average yields and average profits, but is always willing to sell a large portion of his produce at discounted prices to needy families.

Participants were then randomly assigned to one of three conditions: One third of the participants were informed that the majority (percentages varied randomly between 65%-85%) of previous participants chose the able partner, while the minority (percentages correspondingly varied between 35%-15%) of previous participants preferred the willing partner. One third of the participants were informed that the majority (percentages varied randomly between 65%-85%) of previous participants chose the willing partner, while the minority (percentages

correspondingly varied between 35%-15%) of previous participants preferred the able partner. The final third of the participants were assigned to a baseline condition, in which they were not provided with any such information and were simply asked to choose between the willing and able partners.

After choosing their partner, participants were asked whether they would be concerned about their reputation if other people in the community were to learn of their choice, how their choice would affect their reputation in the community, and what others would think of them based on their choice. Participants were also asked to what extent they would experience the emotions of pride, guilt, and shame if others learned of their choice. Next participants were asked about their expectations for their partnership and how hesitant they were when making their partner choice. And then participants were asked, if they were to meet someone who made the same partner choice, how moral and trustworthy they would expect them to be. Finally, participants completed the Dark Triad measure. Before conducting this study, methods, hypotheses, and analysis plans were pre-registered and can be accessed at:

<https://aspredicted.org/blind.php?x=mt4je3>

### *Results*

We replicated the asymmetric conformity effect, which was first observed in Study 8, when examining the partner choice data from the DG in this study. Participants in the baseline condition showed a strong preference for the able Decider over the willing Decider (chose able = 67% vs. chose willing = 33%),  $\chi^2(1) = 11.13, p = .001, w = .35$ . When informed that the majority chose the able Decider, participants continued to prefer the able over willing Decider (chose able = 72% vs. chose willing = 28%),  $\chi^2(1) = 16.79, p < .001, w = .44$ . But when informed that the majority chose the willing Decider, the preference for the able Decider became

non-significant (chose able = 54% vs. chose willing = 46%),  $\chi^2(1) = .58, p = .45, w = .08$ . The overall interaction between choice and condition reached significance,  $p = .04$ .

A pattern of asymmetric conformity was observed in the opposite direction when examining partner choice in the farm vignette, albeit none of the comparisons was significant. Participants in the baseline condition showed a slight, albeit nonsignificant, preference for the willing farmer over the able farmer (chose willing = 56% vs. chose able = 44%),  $\chi^2(1) = 1.42, p = .23, w = .13$ . When informed that the majority chose the willing Decider, participants continued to show a slight, albeit nonsignificant, preference for the willing over able farmer (chose willing = 58% vs. chose able = 42%),  $\chi^2(1) = 2.33, p = .13, w = .17$ . But when informed that the majority chose the able farmer, the preference for the able farmer become greater than the preference for the willing farmer, albeit nonsignificant (chose willing = 44% vs. 56%),  $\chi^2(1) = 1.33, p = .25, w = .12$ . The overall interaction between choice and condition was non-significant,  $p = .11$ .

Participants who chose the willing Decider in the DG anticipated that such a partner choice would have a more positive impact on their reputation and expected others to view them as more moral for choosing the willing Decider (see Supplementary Table 6a). Participants who chose the willing Decider also expected to feel more pride, less guilt, and marginally less shame if others were to learn of their partner choice. Finally, participants who chose the willing Decider, compared to those who chose the able Decider, expected others who made the same partner choice to be more moral and trustworthy.

Participants who chose the willing farmer in the farm vignette reported that they would be less concerned about their reputation if others were to learn of their choice, anticipated that such a partner choice would have a more positive impact on their reputation, and expected others

to view them as more moral for choosing the willing farmer (see Supplementary Table 6b). Participants who chose the willing farmer also expected to feel more pride and less guilt and shame if others were to learn of their partner choice. They also experienced less hesitancy when choosing their partner and expected their partner to be more cooperative. Finally, participants who chose the willing farmer, compared to those who chose the able farmer, expected others who made the same partner choice to be more moral and trustworthy.

Participants who chose the able Decider in the DG scored higher on trait Machiavellianism ( $M = 3.41, SD = .88$  vs.  $M = 3.09, SD = .77$ )  $t(261) = 2.88, p = .004, d = .38$ , and participants who chose the able farmer for the farming partnership scored higher on trait Machiavellianism ( $M = 3.57, SD = .87$  vs.  $M = 3.10, SD = .75$ )  $t(258) = 4.70, p < .001, d = .58$ , narcissism ( $M = 3.48, SD = 1.10$  vs.  $M = 3.06, SD = .95$ )  $t(258) = 2.97, p = .003, d = .41$ , and psychopathy ( $M = 2.75, SD = 1.04$  vs.  $M = 2.42, SD = .87$ )  $t(258) = 2.76, p = .006, d = .34$ . We also found, as predicted, that those who scored lower on trait Machiavellianism tended to have higher expectations of their farming partner to be cooperative, regardless of whether that partner was an able ( $r = -.29, p = .001$ ) or willing ( $r = -.26, p = .003$ ) farming partner.

### *Discussion*

In this study we replicate the pattern of asymmetric conformity found in Study 8, such that people in the DG showed a similar preference for the able partner in both the baseline and able norm condition but this preference disappeared in the willing norm condition. And unlike in Study 8 where the interaction between condition and choice was non-significant, in this replication the interaction between condition and choice was significant. Although we again observed this pattern in the DG, we did not observe the same pattern of conformity in the farmer vignette. Instead people shifted their preference when made aware that majority chose the able

farmer. This difference in the direction of asymmetric conformity could occur because of differences in the baseline preference between conditions. In the DG, the majority preferred the able partner, and in the farm vignette the majority preferred the willing partner. Perhaps people intuit such norms; thus, when they learn that the norm is the opposite, they in turn shift their preference. Furthermore, given that the decision in the farm vignette is higher stakes than the decision in the DG, there may be greater sensitivity to others choosing the able farmer because one would be putting oneself at a substantial disadvantage by choosing a willing farming partner when others choose an able farming partner.

We also replicate the honest signaling effect observed in Study 7, such that people who chose able partners score higher on measures of immoral personality traits. Importantly, we also find evidence that people anticipate that their reputation will be harmed by choosing an able partner and will be enhanced by choosing a willing partner. This provides further evidence of adaptive design in the psychology of the chooser, in that choosers correctly anticipate the signaling effect of their partner choice. Not only do people gain reputational benefits for choosing certain partners, as demonstrated across multiple studies, and also modulate their partner choice to gain such a reputation, as demonstrated in Study 7, but also, as we show in this study, people anticipate the reputational costs and benefits of choosing certain partners.

Furthermore, people who choose able partners anticipate experiencing more negative emotions if others learn of their partner choice and also judge those who also choose able partners as being less moral. Lastly, we find that moral types, as indexed by lower levels of trait Machiavellianism, tend to expect their partner to be cooperative, regardless of whether that partner is an able or willing partner. This supports our argument for why incentives likely favor

moral types to choose willing over able partners. Moral types' expectations will more likely met by willing rather than able partners.

### **Supplementary Study 10**

Study 10 employed a 2(high ability versus low ability) x 2(high willingness versus low willingness) within subject design, such that all participants evaluated four different choosers. The results showed that there are reputational benefits to be gained for valuing both willingness *and* ability during partner choice decisions, but the benefits for valuing willingness are superior (see Supplementary Materials for full study details).

### **Study 11**

Having found that partner choice decisions garner reputational benefits within the context of a Dictator Game, a business partnership, and a farming partnership, we further explore the generalizability of this effect by examining whether such reputational benefits are observed when people are choosing a partner for a social event and when ability is operationalized not as having greater resources or skills but rather as having greater social status. We also test our conceptual model by again examining whether partner choice serves as an honest signal. Similar to Studies 7 and 9, we examine how participant partner choice relates to the Dark Triad of personality traits: Machiavellianism (Christie & Geis, 1970), narcissism, and psychopathy (Jones & Paulhus, 2014). And, we further probe our conceptual model by again testing whether people's preference for ability versus willingness in prospective partners shifts depending on whether people are choosing a partner for a short-term versus long-term relationship.

#### *Methods*

A total of 403 workers from Amazon Mechanical Turk were recruited to participate. A total of 134 participants (33.3%) were excluded based on preregistered exclusion criteria. This

left data from a total of 269 participants (52% Male; Mean age = 38.94,  $SD = 12.00$ ) to be analysed.

Half of the participants were assigned to read the business partner choice vignette described in Study 7. To probe the generalizability of our effect, the other half of the participants were assigned to read a high school vignette. In the high school vignette, we operationalized ability versus willingness not as wealth versus generosity but as popularity versus kindness. This follows previous research defining ability as having the resources to benefit others and willingness as showing an inclination to benefit others (Kafashan, 2017). The high school vignette consisted of a classmate who is very popular (i.e. more able) but very arrogant (i.e. less willing) versus a classmate who is very kind (i.e. more willing) but unpopular (i.e. less able). The popular classmate is able to benefit the chooser more because, as we stipulate in the vignette, by pairing with the popular classmate the chooser is more likely to increase their own popularity at their high school. This is analogous to the business case in that by choosing to partner with the wealthy business partner, the chooser is more likely to increase their own wealth.

Half of the participants who read the business vignette read that the chooser chose the able partner while the other half read that the chooser chose the willing partner. Half of the participants who read the high school vignette read that the chooser chose the able partner while the other half read that the chooser chose the willing partner. After reading about the chooser's decision, participants evaluated the chooser on how trustworthy and moral, how emotional and logical, and how warm and competent they seemed. Participants assigned to the business vignette were asked to choose which business partner they would choose for both a long-term friendship and a short-term business partnership and the participants assigned to the high school

vignette were also asked to choose which classmate they would choose to invite to the social event and who they would choose for a long-term friendship.

Finally, participants completed a modified measure of trait Machiavellianism (Christie & Geis, 1970), narcissism, and psychopathy (Jones & Paulhus, 2014). Before conducting this study, methods, hypotheses, and analysis plans were pre-registered and can be accessed at:

<http://aspredicted.org/blind.php?x=d2vg8j>

### *Results*

In the business partner condition, participants rated those who chose the willing business partner as more trustworthy, moral, emotional, logical, warm, and competent (see Supplementary Table 5a for statistical details). Such participants also chose the willing business partner more often when deciding on a partner for a long-term relationship (95% chose the willing partner) versus short-term relationship (68% chose the willing partner),  $p < .001$ . Participants who chose the able partner for a short-term relationship scored higher on trait Machiavellianism ( $M = 3.64$ ,  $SD = .76$  vs.  $M = 3.31$ ,  $SD = .80$ ),  $t(127) = 2.28$ ,  $p = .03$ ,  $d = .42$ , and lower on trait narcissism ( $M = 3.38$ ,  $SD = 1.05$  vs.  $M = 3.81$ ,  $SD = .94$ ),  $t(123) = 2.19$ ,  $p = .03$ ,  $d = .43$ .

In the high school classmate condition, participants rated those who chose the willing classmate as more trustworthy, moral, emotional, logical, warm, and competent (see Supplementary Table 5b for statistical details). Such participants also chose the willing classmate more often when deciding on a partner for a long-term relationship (98% chose the willing classmate) versus short-term relationship (90% chose the willing classmate),  $p < .006$ .

Participants who chose the able classmate for a short-term relationship scored higher on trait Machiavellianism ( $M = 4.01$ ,  $SD = 1.03$  vs.  $M = 3.16$ ,  $SD = .70$ ),  $t(138) = 4.11$ ,  $p < .001$ ,  $d = .97$ .

Participants who chose the able classmate for a long-term relationship scored higher on trait

Machiavellianism ( $M = 4.29$ ,  $SD = .81$  vs.  $M = 3.22$ ,  $SD = .77$ ),  $t(138) = 2.37$ ,  $p = .02$ ,  $d = 1.35$ , trait narcissism ( $M = 4.37$ ,  $SD = .28$  vs.  $M = 3.60$ ,  $SD = 1.04$ ),  $t(3.55) = 4.13$ ,  $p = .02$ ,  $d = 1.01$ , and trait psychopathy ( $M = 4.42$ ,  $SD = .80$  vs.  $M = 2.51$ ,  $SD = 1.02$ ),  $t(138) = 3.21$ ,  $p = .002$ ,  $d = 2.08$ .

### *Discussion*

This study demonstrates that the reputational benefits we observed in previous studies within the contexts of the DG, business vignette, and farming vignette generalize to other social contexts and we replicate our primary effect when operationalizing ability versus willingness as popularity versus kindness. Importantly, we again replicate our honest signalling effect by showing that those who choose willing partners not only are more generous in economic games but, as mirrored in Studies 7 and 9, also score lower on measures of immoral personality traits. Replicating another result from Study 7, we find that people value willingness significantly more when deciding on a partner for a long-term versus short-term relationship. Both of these findings support our costly signalling framework. If people who choose willing partners are less likely to be manipulative and are more interested in seeing a relationship last into the long run, such people are more likely to have relationships that last into the long run. Thus, greater incentives exist for such people to choose willing over able partners. On the other hand, given the higher level of immoral character traits among those who choose able partners, such people may be more likely to have relationships that dissolve in the long run. Therefore, it is more beneficial for such individuals to value ability over willingness. Given that they are less likely to be in long-term relationships, they are unable to derive the benefits necessary to make pairing with willing partners adaptive.

Also noteworthy is that, unlike in the DG where people saw those who choose able partners as being more competent and logical, here we find that those who choose willing partners are seen as more competent. This may be due to the increase in contextual factors that could render the partner decision less transactional and more personal, relative to the DG. Also interesting is that in the business partner condition those who chose to partner with the willing partner for a short-term business partnership reported being *more* narcissistic. This unexpected result fits broadly with our results from Study 6, showing that people who choose willing partners believe themselves to be worthier of praise and expect others to view them as highly competent and warm. On the other hand, those who chose to partner with the popular classmate for a short-term business partnership reported being more narcissistic. This result may stem from narcissistic types' viewing themselves as being popular and therefore seeing the popular classmate as a good match (Jonason & Schmitt, 2012).

### **General Discussion**

As a highly social species, humans have to successfully navigate their social interactions by finding the best partners. Sometimes this involves choosing between individuals who are more willing and individuals who are more able. Here, we demonstrate that many people (sometimes the majority, sometimes a large minority) opt for a partner who is more willing to cooperate, forgoing the immediate material gains of instead partnering with someone who is more able. What explains this seemingly irrational behavior? Across 11 studies we provide a potential answer: Choosing willing over able partners affords reputational and partner choice benefits.

Across our studies we provided evidence of a second-order partner choice selection effect. In particular, in Study 1 we found with a university sample that choosing a willing partner

over an able partner (i) affords one a moral reputation, and (ii) makes one more likely to be chosen as a cooperation partner. In Study 2, we replicated this second-order partner choice selection effect with a sample of workers recruited from MTurk using an incentivized experiment with real money at stake. Interestingly, we found that this preference held irrespective of people's own preference for able versus willing others. That is, even people who choose able partners for themselves prefer others who choose willing partners.

We expanded upon these results by probing the moderators of partner choice. In particular, we tested whether partner choice is sensitive to social visibility (Studies 5 and 6), injunctive norms (Study 7), descriptive norms (Studies 8 and 9), and time horizons (Studies 7 and 11). We also examined whether people accurately predict the signal they are sending via their partner choice decisions (Study 6), whether the signaling benefits vary based on the choice set of potential partners (Study 10), and whether the signaling benefits replicate across various different contexts and operationalizations (Studies 7, 9, and 11).

We found evidence that partner choice decisions may be sensitive to both injunctive and descriptive norms but not social visibility (see Kraft-Todd, Yoeli, Bhanot, & Rand 2014 for a review on the effect of social norms and social visibility on cooperative behavior). Specifically, we found in Study 7 that people adjust who they choose as a partner based on the ideology of their audience and thus the reputational incentives at play. We also found in Studies 8 and 9 that people may also shift their partner choice preference due to the descriptive norms of the group. In Study 9 we also found that people anticipate that their reputation will be harmed by choosing an able partner and enhanced by choosing a willing partner. This provides further evidence of adaptive design in the psychology of the signaler. We also found in Study 9 that moral types, as proxied by lower levels of trait Machiavellianism, expect their partner to be more cooperative.

This result finds interesting parallels in the might versus morality effect (Liebrand, Jansen, Rijken, & Suhre, 1986; Sattler & Kerr, 1991; Van Lange & Kuhlman, 1994) and also supports our conceptual model that predicts moral types will be dissatisfied with the uncooperative behavior of able versus willing partners. In Study 6, we also found that people recognized that when they themselves choose willing partners they are signaling their morality, though they also, on some variables, mispredict the magnitude of the signal. This serves as the first investigation into individuals' meta-judgments of their partner choice decisions and adds to the growing literature on the accuracy of meta-judgments (Moon, Gan, & Critcher, 2020; Lees & Cikara, 2019; Rom & Conway, 2018; Saguy & Kteily, 2011; Waytz, Young, & Ginges, 2014).

In Study 10 we found, by employing a full factorial design, that valuing willingness *and* valuing ability both enhance a chooser's reputation. Nevertheless, the effect for valuing willingness is substantially larger. We rule out an alternative explanation for our effect: there is no reputational benefit for partnering with others who are unable if they are also unwilling. When the option exists to choose a partner who is both able *and* willing, choosing someone who is able but unwilling no longer signals competence and logicity. In Study 11 we demonstrate the generalizability of our primary effect by showing that our effect replicates not only when ability is operationalized as wealth or skill but also when ability is operationalized as high social status. We find that the effect sizes observed with these new operationalizations were even larger than what we observed with the DG, providing further support for the robustness of our effect. We also replicate the effect observed in Study 7: people value willingness more for long-term versus short-term partners.

In total, our findings suggest that, from an ultimate perspective, the tendency to value willingness when making partner choice decisions may be understood within a reputation-based

framework (Jordan & Rand, 2019). Although people have more to gain materially in the short-term from partnering with a more able partner, people have more to gain reputationally from partnering with a more willing partner. Our findings suggest that these reputational benefits translate into cooperative benefits, with those choosing willing partners being more likely to be chosen as cooperation partners in subsequent interactions. Importantly, we find that choosing a willing partner appears to be an honest signal—those who choose willing partners score higher on individual difference measures of moral character (Studies 7, 9, and 11) and behave more generously in economic games (Studies 2, 4, and 5).

### **Limitations and Future Directions**

Economic games, such as the DG, have been used in hundreds of experiments across a diverse array of human populations (Camerer 2003; Fehr, Fischbacher, & Gächter, 2002; Hoffman, McCabe, & Smith, 1998; Kahneman, Knetsch, & Thaler, 1986; Roth, 1995), as well as in experiments on chimpanzees (Bueno-Guerra, Völter, de las Heras, Colell, & Call, 2019). These games allow for experimenters to avoid the inherent idiosyncratic nature of vignette studies and thus aid in the potential generalizability of experimental findings. Furthermore, these games provide the opportunity for experimenters to observe human behavior when real money is at stake, supporting the external validity of the findings. With that said, given the low stakes and artificial nature of economic games, the external validity afforded by this methodology could be enhanced. To address this concern, we examined and found that our primary results replicated outside of the context of a DG. This is to be predicted given that other research has documented a correlation between behavior in economic games and behavior in contexts such as donating to charities and returning lost money (Benz & Meier, 2008; Franzen & Pointner, 2013; Stoop, 2014). In fact, the effect sizes we observed in other contexts were much larger than what we

observed within the context of the DG, suggesting that the DG results may provide conservative estimates. But of course, future research is needed to examine whether the full set of results we found within the context of the DG replicate within the other contexts we examined.

We did not examine the reputation that is gained by selecting someone for a specific duty, such hiring an employee for a certain job, where the chooser may have a mandate to select the most qualified individual (Behling, 1998; Barrick & Mount, 1991). Instead, we examined the act of choosing a partner for a cooperative interaction. We explored this question within the context of choosing to partner with a more generous versus more rich dictator in the DG, more generous versus more rich business partner on a business deal, more generous versus more skillful farming partner on a new farm, and more kind versus more popular classmate at school. Countless other examples can be constructed, e.g., choosing to partner with a more helpful versus more skillful fellow employee on a team project; choosing to partner with a more committed versus more attractive romantic partner. Also, it would be useful for future research to examine whether those who choose willing partners continue to enjoy reputation and partner choice benefits if their partnering with willing over able partners leads to the subsequent failure at certain tasks.

We also note that the hypothesis being proposed here does not preclude a role for other mechanisms in the prioritization of willingness over ability during partner choice. For example, both assortative pairing (Robinson et al., 2017; Thiessen & Gregg, 1980; Zietsch, Verweij, & Heath, 2011) and the fact that greater variance exists across individuals in willingness traits compared with ability traits (Eisenbruch & Krasnow, 2019) may additionally explain why some individuals prioritize willingness. Furthermore, willingness may also be favored in others insofar as it is perceived to be a more domain general trait, whereas ability may be perceived to be more

domain specific and thus less beneficial outside specific domains (Barclay, personal communication). Future research should examine which of these hypotheses provides the greatest explanatory power. Finally, although the findings from our experiments are what would be predicted from our conceptual model, it would be useful for future research to formalize our conceptual model to determine whether it is sufficient to produce a separating equilibrium and further substantiate it using agent-based modeling.

### **Conclusion**

Choosing partners can be challenging and costly. Often, individuals value a partner's willingness over their ability to deliver benefits, even when choosing the willing partner is immediately costly. Why would people make the costly decision to partner with someone who cannot provide as much? Here, we present evidence for an ultimate explanation: people who choose a willing partner are more likely to gain a moral reputation and are more likely to be chosen themselves as cooperation partners. Furthermore, in such cooperative interactions, those who choose willing partners are in fact more cooperative with others. Taken together, our findings provide a functional account for why some individuals make the costly decision to value willingness over ability when making partner choice decisions.

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