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The Influence of Similarity and Social Reciprocity on Decisions to Trust

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Abstract

Trust decisions made in the social world have important consequences for decision makers, such as financial and/or social losses. Given the importance of these decisions, psychologists often ask what variables lead to trust. The most commonly studied predictor variable is the degree of similarity between participants and their interaction partners. Here we ask how a more visible cue, social reciprocity, affects trust decisions in concert with similarity. We use a “chat-room” style task to independently manipulate the degree to which participants are similar to a set of avatars that they believe are other players and the degree to which those avatars display social reciprocity. We then assess trust decisions in both financial and social domains. Our results show that together with similarity, social reciprocity is an important independent predictor of trust decisions. This work has implications for understanding how and when trust is allocated, as well how to facilitate successful interactions.

Keywords

Social Reciprocity, Similarity, Social Interaction, Trust

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Table of Contents

List of Figures

List of Appendices

Chapter 1

1 Introduction

Decisions about whether to trust another person, and their subsequent effects on behaviour are critical elements of the social environment. At the core of these decisions are the factors upon which people base interpersonal judgments. As with decisions in the cognitive domain, people rely on heuristics to make social decisions quickly, efficiently, and often, with little information about the true trustworthiness of their social partners (Metzger & Flanagin, 2013). For example, people may use the degree to which they perceive themselves to be similar to an interaction partner when making trust-based decisions. Because humans naturally attend to this type of social information (Wood, 1996), it likely guides the application of heuristics in the social decision-making process.

The most frequently studied behavioural predictor of interpersonal decisions is the degree to which two people are similar to one another. Researchers have examined similarity across a variety of contexts and choice types, such as negotiation outcomes (Wilson, DeRue, Matta, Howe, & Conlon, 2016) and romantic partner selection (Campbell, Chin, & Stanton, 2016; Tidwell, Eastwick, & Finkel, 2013). Findings from this work broadly suggest that as the similarity between oneself and one's interaction partners increases, one is more likely to like, cooperate with, and trust those partners (Fischer, 2009; Lui, Ngo, & Hon, 2006). Thus, high levels of similarity positively influence interpersonal perception (Bagues & Perez-Villadoniga, 2013)

Researchers often operationalize and manipulate interpersonal similarity using group membership (e.g., Chen & Kenrick, 2002; Vang & Fox, 2013). Specifically, people

who are similar to the self on some experimentally salient dimension (e.g., race, sex, location of origin, team assignment, university) are classified as in-group members and those who are dissimilar on that dimension become the out-group (e.g., Appiah, Knobloch-Westerwick, & Alter, 2013). Evidence from this work largely shows that people are much more likely to like, cooperate with and trust in-group relative to out-group members, partially because they are more similar with respect to the experimental context (Balliet, Wu, & De Dreu, 2014; Greenwald & Pettigrew, 2014)

One common operationalization of trust decisions in group-dynamics research is the degree to which participants are willing to cooperate (Mayer, Davis, & Schoorman, 1995). This is an obvious dependent variable because of the natural relationship between cooperation and trust; to cooperate with another person, one must place trust in that person. This means work that investigates the effects of similarity on cooperation can also inform how similarity impacts trust.

In experimental contexts, similarity generally promotes cooperative behaviours. For example, in an economic trust game, people who interact with a person of another race return less money than people who interact with a person of the same race (Glaeser, Laibson, Scheinkman, & Soutter, 2000). Thus, physical or appearance-related similarity increases trust behaviours (e.g., DeBruine, 2002; DeBruine, 2005). Research has also indicated that people with similar interests are more likely to trust one another. For instance, Ziegler and Golbeck (2007) have reported that people who have similar tastes in film and literature trust one another more than people with dissimilar film/literature taste. In real-world business contexts, similarities between firms lead to increased trust, which results in decreased use of coercive strategies (Lui, Ngo, & Hon, 2006). These findings,

amongst others, suggest that similarity leads to incremental increases in trust and trust-related behaviours.

There are several mechanisms that may underpin the similarity-trust relationship. One such mechanism is evolutionary. Grounded in "kin selection" hypotheses, this idea suggests that because people frequently cooperate with and trust close relatives, who resemble themselves in appearance, people may use appearance as a signal to indicate trustworthiness (Farmer, McKay, & Tsakiris, 2013; Krupp, DeBruine, & Barclay, 2008). Findings suggest that people compute a "kinship index", which indicates potential relatedness and consequently trustworthiness (Lieberman, Tooby, & Cosmides, 2007). When the level of kinship, or the level of similarity in appearance increases, so does cooperative behaviour (Griffin & West, 2003). This means that increases in appearance similarity serve as a proxy for relatedness, thereby facilitating cooperation, altruistic behaviour, and trust (DeBruine, 2002; Krupp, DeBruine, & Barclay, 2007).

Another mechanism that may underpin the similarity-trust association comes from the literature on relationship formation. Specifically, people who share interests, attitudes, and personality features are more likely to like each other than people who do not share these attributes (McPherson, Smith-Lovin, & Cook, 2001; Rushton & Bons, 2005; Youyou, Stillwell, Schwartz, & Kosinski, 2017). Thus, similarity may provide a footing upon which people can form close bonds, such as friendships and marriages. It is not surprising then that people trust those who are more similar to themselves on such dimensions than less similar individuals (Simons, 2008). Likewise, attitude similarity may be a heuristic cue for kinship (Park & Schaller, 2005), which further supports the idea that attitude similarity leads to trust.

A third explanation for the similarity-trust relationship comes from the literature on "fluency effects" (e.g., Gigerenzer & Gaissmier, 2011; Whittlesea & LeBoe, 2000). The presence of similarity may make it easier to trust someone because similar attitudes and beliefs are more easily accessible. For example, people use their own attitudes and behaviours to interpret the attitudes and behaviours of those around them (Gordon, 1992), leading to easier recall of thoughts and attitudes, more accurate predictions of future behaviour, and increased positivity toward similar others. A recent functional imaging study supports this idea showing that people use the self as a reference when inferring others' states and traits (Jenkins, Macrae, & Mitchell, 2008). The authors concluded that people tend to attribute their perceptions of others' trustworthiness to shared similarity (Jenkins, Macrae, & Mitchell, 2008), likely enhancing perceived trust in the process (Krueger, 1998; Taylor & Brown, 1988). Thus, the ease or fluency with which people interpret others' behaviour may be a heuristic that people use when making trust decisions.

Interestingly, similarity need not be objectively present in order to achieve these effects. Rather, the mere perception of similarity is enough to convey benefits. For example, a naturalistic longitudinal study, found that greater levels of perceived similarity upon first meeting a new freshman undergraduate roommate led to more trust over time (Whitmore & Dunsmore, 2014). Other researchers have found that perceived similarity between nurses and patients is associated with improved patient satisfaction; from which they deduce that high levels of perceived similarity between community health workers and patients likely improves patient trust as well (Sanders, Winters, & Fiscella, 2015). Moreover, when people perceive greater levels of similarity in others

(e.g., using manipulated facial photos), they show higher levels of cooperation and trustworthy behaviour (DeBruine, 2002).

Taken together, this evidence suggests that similarity appears to be a reliable predictor of cooperation and trusting behaviour. Indeed, the effects of similarity manipulations replicate across various naturalistic and experimental settings using a variety of methods. Although we are confident that similarity relates to trust and cooperation, this body of research is not without its limitations. Specifically, similarity is often studied in a naturalistic or correlational manner (e.g., Glaeser, et al., 2000; Lui, et al., 2006; Whitmore & Dunsmore, 2014), meaning that other variables may be driving reported effects. Moreover, researchers often manipulate similarity along race or gender categories (e.g., Chen & Kenrick, 2002; Vang & Fox, 2013), meaning that stereotypes against obvious out-group members might be responsible for results, rather than similarity. Therefore, the extent to which similarity underpins research findings remains unclear.

Much of the literature on trust decisions has assumed that similarity underpins decisions to trust, based on evidence showing that minimal group manipulations (e.g., same versus rival-university students (Montoya & Pittinsky, 2011)) enhance trust decisions. However, in the real world, these cause-effect relationships may be more complicated. For example, one may actively seek evidence of similarity with a social partner when one experiences trustworthy, fair, or cooperative behaviour. This, in turn, may lead to increased perceptions of similarity that stem from a tendency to minimize, not notice, or to forget differences. Indeed, in a clever paradigm in which participants invested with computerized trustees depicted by photographs, Farmer, McKay and

Tsakiris (2014), found that participants perceived trustworthy trustees as showing greater appearance similarity to themselves than untrustworthy trustees. Thus, it appears that perceived similarity leads to trust and trustworthy behaviour leads to perceived similarity.

Without a strong objective manipulation of similarity levels, it is difficult to discern cause from effect in the similarity-trust relationship. Thus, it is currently impossible to determine whether similarity leads to trust or vice versa. Moreover, given that many trust decisions play out in real interpersonal environments, other social or interaction-level factors may have clear and important causal roles in understanding the development of trust decisions. Here we take the view that the quality of a social interaction independently contributes to trust decisions. Specifically, we examine how reciprocity of social behaviour (e.g., returning a social partner's smile, nod or gesture) contributes to decisions to trust.

Social reciprocity is important for three reasons. First, this factor is strongly apparent in face-to-face social interactions (Heerey & Kring, 2007; Heerey & Crossley, 2013), including those that culminate in trust decisions. Second, reciprocity of an interaction is apparent nearly immediately, meaning that it is the first social cue one receives about their interaction partner. It is likely then that social reciprocity colours our interpretation of other social cues that occur later in the interaction sequence. Third, decisions to trust engender reciprocity norms (Pillutla, Malhotra, & Muringhan, 2003). That is, when people engage in acts of trust, they expect that their trustees will reciprocate this trust in kind (Malhotra, 2004). Thus, reciprocity of social behaviour may serve to communicate a social partner's trustworthiness by providing information about the stability of the social environment (Behrens, Hunt, Woolrich, & Rushmore, 2008;

Behrens, Hunt, & Rushmore, 2009) and consequently the likelihood of social norm compliance.

Behavioural mimicry, the inadvertent imitation of an interaction partner's nonverbal behaviour or verbal style (Duffy & Chartrand, 2015), is one operational definition of social reciprocity. Mimicry between interaction partners predicts increased liking, cooperation, and trust (Duffy & Chartrand, 2015; Fischer et al., 2013; Lakin & Chartrand, 2003; Seibt, Mühlberger, Likowksi, & Weyers, 2015). For example, in a study of interpersonal negotiations, individuals who engaged in mimicry were more likely to achieve successful outcomes than those who did not. Interestingly, this did not lead to negative outcomes for the person being mimicked. Rather, mimicry had an overall positive effect within the dyad (Maddux, Mullen, & Galinsky 2008). Research has also consistently indicated that participants like and trust people and avatars, who mimic more than those who do not mimic (Chartrand & Bargh, 1999; Chartrand & Lakin, 2013; Seibt et al., 2015). Mimicry may therefore be influential in creating rapport and bolstering interpersonal connections (Seibt et al., 2015).

In real face-to-face interactions, instances of mimicry are a subset of a broader class of reciprocal social behaviours. Reciprocity refers to the active exchange of social information and may refer to verbal and nonverbal behaviours or feelings (Heerey & Crossley, 2013; King-Casas, et al., 2005). For example, evidence shows that people commonly exchange smiles in face-to-face encounters (Heerey & Crossley, 2013) and that people report greater liking for others who indicate liking for them (Montoya & Horton, 2012). Note that reciprocity is not necessarily positive. Indeed, in competitive encounters in which one player defects, other players often follow a "tit for tat" strategy,

mutually reciprocating defection or punishment (Axelrod, 1980; Van Lange & Visser, 1999). While this strategy may be effective in the prisoner's dilemma or other laboratory cooperation games (e.g., Duersch, Oechssler, & Schipper, 2014) it can be suboptimal in real-world social situations, such as the presence of conflict in the workplace (Andersson & Pearson, 1999)

Reciprocity of behaviour and liking in face-to-face interactions may subsequently support the development of trust and cooperation. For example, without adequate levels of low-level behavioural reciprocity (e.g., nodding, smiling), an interaction may feel disfluent, awkward and uncomfortable (Delaherche et al., 2012), leading to poor outcomes, including reduced trust and willingness to cooperate with the social partner (Launay, Dea, & Bailes, 2013). Moreover, when reciprocal behaviours are tightly coupled in time, known as social synchrony (Delaherche et al., 2012), social interactions result in greater levels of rapport, cooperation, and overall perceptions of conversational "smoothness."

A growing body of research has suggested that temporal synchronization between interaction partners leads to an increase in cooperation (Kirschner & Tomasello, 2010; Valdesolo & DeSteno, 2011; Wiltermuth & Heath, 2009). For example, it may precede the development of prosocial behaviour, cooperation, and positive emotion (Chartrand & Lakin, 2013), as well as feelings of trust toward an interaction partner (Launay, Dean, & Bailes, 2013). Interestingly, temporal synchronization may spontaneously emerge when participants are asked to work cooperatively rather than competitively on a task (Bernieri, Davis, Rosenthal, & Knee, 1994), suggesting that people may treat the presence of temporal synchrony as a signal of cooperation. Thus, social synchrony, as with mimicry

and reciprocity, tends to have positive effects within dyads including increased rapport and feeling of smoothness or coordination during interaction (Wiltermuth & Heath, 2009).

Although interesting, the current mimicry literature suffers from several limitations. Chief among these is whether the observed mimicry is actually genuine mimicry. Specifically, whereas mimicry is the automatic and unintentional imitation of another's behaviour (Lakin, Chartrand, & Arkin, 2008), it is not uncommon for researchers to code an instance of mimicry 10 or more seconds from the initiating behaviour and when the initiating behavour is no longer observable (e.g., Stel & Vonk, 2010). Because interactions are extremely fast-paced and social cues may be fleeting (Yan, Wu, Liang, Chen, & Fu, 2013), the contingency between the initiating and response behaviours may be weak or non-existent by the time 10 seconds have elapsed. For example, the likelihood of smile reciprocity within unmanipulated interactions reaches asymptotic levels by approximately 4 seconds (Heerey & Crossley, 2013). In addition to the overlong time lapse, researchers also frequently instruct participants to mimic one another. Since real mimicry is automatic, unconscious, and unintentional (Seibt et al., 2015), this may lead to artificial or contrived interactions which differ on other characteristics besides the presence or absence of mimicry.

1.1 Present Experiments

Here, we are interested in how both similarity and social reciprocity shape interpersonal perception and subsequent trust-based decision-making. Because we treat similarity and reciprocity as independent variables, we use a minimal social context in which it is possible to reliably manipulate them. Specifically, participants in the present

experiments "interacted" with avatars, which they believed to be other participants, in the context of an online chat-room style environment.

This work comprises three independent experiments. The purpose of the set of experiments was to examine how objective similarity between interaction partners, as well as social reciprocity, influence participants' trust decisions. To manipulate objective similarity, we asked participants to respond to 20 questions that concern frequently exchanged information during the getting acquainted process (e.g., "Are you originally from Canada?"). We then allowed participants to exchange this information with a set of avatars that they believed were other participants. To manipulate similarity, the avatars' responses matched participants' responses with either high or low frequency. Our social reciprocity manipulation relied on the exchange of emojis (e.g., ☺) as a form of behavioural exchange during participants' "interactions" with the avatars. A reciprocal interaction took place when an avatar's emoji feedback matched that given by a participant (Chapter 2 provides additional detail).

We measured trust in different ways across the experiments. In Experiment 1, we used a simple economic game, based on a "centipede game" (Rosenthal, 1981) in which two players take turns deciding whether to steal a pot of money or to pass it to their opponent. The money (and therefore the incentive for defection) doubles with each pass so participants should engage in a greater number of passes with opponents they believe to be trustworthy, relative to those they believe to be untrustworthy. In Experiments 2a and 2b, we measured trust with a classic investor/trustee game (Berg, Dickhaut, & McCabe, 1995). In an investor/trustee game, players are assigned to the investor or the trustee role on each round. The investor must make an investment ranging from 0% to

100% of an endowment they have received. The investment then "matures" and the trustee must choose which proportion of the matured investment (0% to 100%) to return to the investor. The amount invested indicates the degree to which an investor trusts a trustee whereas the return amount indicates the trustee's actual trustworthiness.

In our third experiment, we examine the degree to which manipulated similarity and reciprocity contribute to the "utility" or subjective desirability of another player as the target of a trust interaction. Here, we rely on a utility task in which participants choose amongst pairs of avatars for trust-related interactions (see Von Neumann & Morgenstern, 1944). Because participants respond to all possible avatar pairings several times, participants' choices allow us to estimate the independent contributions of similarity and reciprocity in trust-related decision-making, as well as their interaction.

Chapter 2

2 General Methodology

Experiments 1, 2, and 3 used exactly the same manipulation of similarity and reciprocity. The purpose of this chapter is to provide the details of these manipulations, along with the questionnaires used in the protocol. Because we measured trust differently depending on the experiment, trust measurement will be described within each experimental chapter.

2.1 General Protocol

Participants arrived to the lab in groups of five for a study "about how people get to know one another in an online environment." In reality, participation in this study was independent and participants interacted with computerized avatars. We used computerized avatars, rather than a naturalistic interaction, because this was the only way to experimentally manipulate both similarity and social reciprocity and to ensure that the manipulation was identical across participants (Heerey, 2015; Schilbach et al., 2006). However, it was essential to our experimental design that participants believed they were actually becoming acquainted with real people. Inviting them to the lab in groups helped us to achieve this deception.

Once a group of participants arrived at the lab, they were seated in individual testing rooms for the duration of the experiment. After consenting to the study procedure (see Appendix B), participants selected one of 16 possible avatar images (8 female and 8 male) to represent them for the duration the experiment (see Figure 1). The avatar set consisted of vector graphics and was rated by an independent set of participants to determine the degree to which they were visually similar across avatars. After participants selected an avatar, the computer told them that another player had already selected their choice. The computer then asked them to select a second avatar, which was always allocated to the participant. The participant's first choice of avatar always appeared in the experiment as one of the highly similar avatars. Pilot testing suggested that this procedure enhanced the believability of the experiment. The computer selected

the other three avatars with which participants interacted based on pre-rated similarity in appearance. One of these avatars was always highly similar in appearance to the participant's own avatar. The remaining two avatars had been pre-rated as low in appearance similarity to the participant's own avatar.

Figure 1. Avatar selection. Participants began the task by selecting an avatar to represent them within the game.

2.2 Similarity Manipulation

To manipulate objective similarity, we first asked participants to respond to 20 "getting-acquainted" type questions (see Appendix C). Four of these items were high-value "attitude" questions (i.e., "Would you consider yourself a feminist?", "What would you most like to be someday?", "Would you tend to see yourself as more liberal or more conservative?", and "Do you have a religious affiliation?"). We based this designation on pre-screening data from an independent participant sample. This sample rated the items according to how important each item was to them and how important it would be for their friends to respond similarly. The remaining items were rated as less important on both dimensions. Participants saw and responded to these forced-choice multiple-choice questions in random order (see Figure 2).

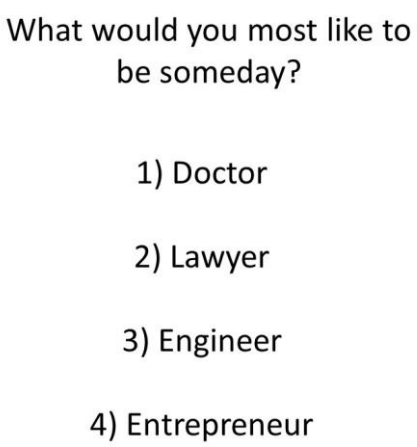

Figure 2. Getting-acquainted question example. Participants answered a series of forced choice questions about themselves. The computer used their answers to manipulate objective similarity.

After participants responded to these questions, they "exchanged" answers with each of the other avatars. As displayed in Figure 3, participants viewed a screen containing the question, their own avatar and response and another avatar and that avatar's response. They viewed responses to each of the 20 questions for each avatar individually. The computer fully randomized the presentation order for the 80 items (20 questions for each of four avatars).

The computer manipulated similarity based on the participant's responses to the 20 questions. Two avatars were "high" in similarity. These avatars mirrored more of the participant's own responses to the initial questions. Specifically, high-similarity avatars matched the participants' responses on the four "important" questions (e.g., "What would you most like to be someday?"). These avatars also matched on a random set of 12 of the less important items (e.g., "What's your favourite cuisine?"). The two avatars that were low in similarity matched on fewer of the participant's own responses to the 20 questions. These avatars did not match on any of the attitude questions but did match on a random set of four of the less important items. These numbers were selected based on pilot testing showing that "low-similarity" avatars who matched participants' responses on none of the items detracted from the believability of the manipulation.

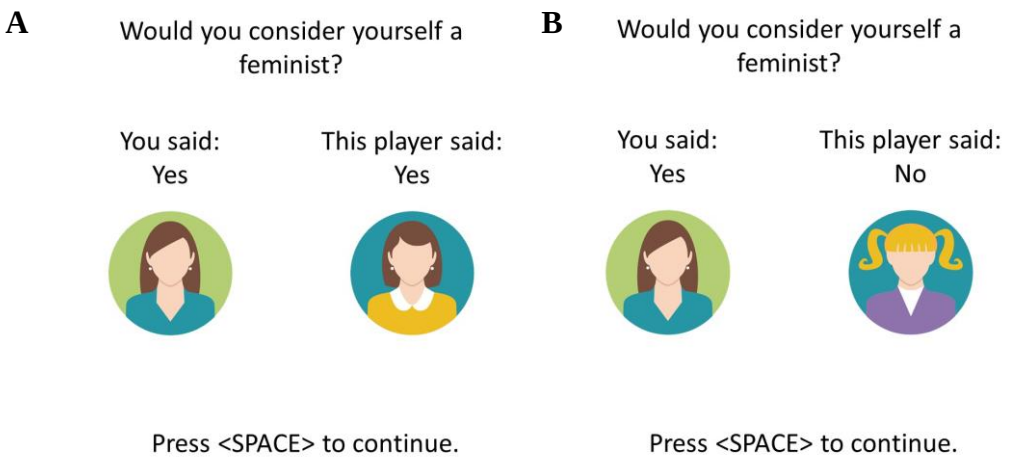

Figure 3. Answer exchange examples. (a) This represents an instance of high similarity. (b) This represents an instance of low similarity. Participants engaged in 80 exchanges across the four avatars.

2.3 Social Reciprocity Manipulation

The social reciprocity manipulation occurred conjointly with the similarity manipulation. Participants gave like/dislike feedback after viewing each avatar's response to the similarity items. After viewing the similarity information, participants gave feedback to their partners using an emoji-style rating scale (Figure 4) similar to what one might see in a social media application. After participants indicated their feedback response (see Figure 4a), they saw a screen with their own emoji feedback and the avatar's feedback. The avatar's responses could either be reciprocal (matching) (e.g., Figure 4b) or non-reciprocal (non-matching; Figure 4c). Importantly, non-reciprocal feedback was 1-level more positive or 1-level more negative on the emoji scale than that of the participant such that the average discrepancy in the feedback positivity between avatars and participants was zero. Two avatars (one high in similarity and one low in similarity were low-reciprocity, and provided matching emojis on only 20% of trials. The remaining two avatars were high-reciprocity avatars and provided matching feedback on 80% of trials.

The task was programmed and presented in E-prime (v 2.0, Psychology Software).

Figure 4. Social reciprocity feedback. (a) The feedback decision screen where the participant decides what feedback to give the avatar. (b) An example of a reciprocal feedback exchange. (c) An example a non-reciprocal feedback exchange.

2.4 Ten-Item Personality Inventory (TIPI)

The TIPI (See Appendix D; Gosling, Rentfrow, & Swann, 2003) was administered at the end of the experimental manipulation of similarity and social reciprocity. The TIPI assumes a 5-factor personality structure and measures extraversion ("I see myself as extraverted, enthusiastic), openness to experience ("I see myself as open to new experiences, complex"), agreeableness ("I see myself as sympathetic, warm"), emotional stability ("I see myself as calm, emotionally stable"), and conscientiousness ("I see myself as dependable, self-disciplined"). Participants rated each avatar and themselves using this instrument. We added one additional item to the avatar-ratings of the TIPI in every experiment ("I see [avatar picture] as similar to me"). In Experiments 2 and 3 participants additionally rated each avatar on a second item ("I see [avatar picture] as in sync with my feelings"). These additional items served to measure the degree to which participants perceived the similarity and reciprocity manipulations. Participants rated each item on a 7-point Likert scale (1 = Disagree strongly; 7 = Agree strongly).

Chapter 3

3 Experiment 1

3.1 Introduction

This experiment asks whether social reciprocity, in addition to similarity, influences trust decisions. To answer this question, we utilized an economic game to measure trust. Economic games have been used to measure trust behaviour for decades (e.g., Burnham, McCabe, & Smith, 2000; Costa-Gomes, Huck, & Weizsacker, 2014; Glaeser, et al., 2000; Ong, Zaki, & Gruber, 2017; Rotter, 1967). These games have also been demonstrated to be a valid measurement of trust behaviour (Brulhart & Usunier, 2012).

3.1.1 Hypotheses

This experiment had two hypotheses: 1) there will be a significant main effect of similarity on trust behaviour and 2) there will be a significant main effect of social reciprocity on trust behaviour, such that greater levels of both similarity and reciprocity will enhance trust.

3.2 Methods

3.2.1 Participants

Sixty-nine participants completed this study in exchange for partial course credit and a small monetary bonus, which was based on their performance in the trust game in this study. Of these 69, 13 were discarded from the analysis due to deception failure (they did not believe they had played real participants). The final sample therefore included fifty-six undergraduate participants (14 male, mean age = 18.45, *SD* = .83). All participants gave documented informed consent and the University's Ethics Committee approved all study procedures (likewise for Experiments 2 & 3).

3.2.2 Procedures

To measure trust, we used a simple economic game, based on a "centipede" game (Rosenthal, 1981). In a traditional centipede game there are two players who take turns passing pots of money or points (in the present case), until one of them chooses to defect or some number of exchanges have happened (traditionally 100 exchanges). On any given turn, the active player receives two pots of money, one large and one small. The player then chooses to either take the larger of the two pots (giving the smaller to the other player) or to pass both pots to the other player. If a player chooses to pass the pots to the other player, the pots both double in size (see Figure 5). We selected this game because, unlike the prisoner's dilemma and other common games (e.g., Kanazawa, & Fontaine, 2013; Sparks, Burleigh, & Barclay, 2016), it is designed as an iterated game, and with each pass of the pots, the incentive to defect increases.

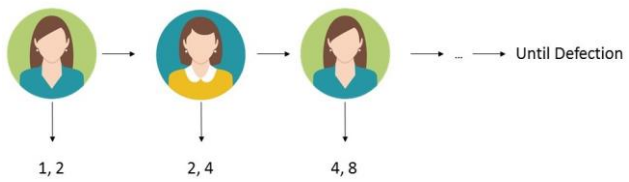

Figure 5. Centipede-style game used in Experiment 1.

The dominant strategy in this game is for the first player to take the pot on the first round of the game (McKelvey & Palfrey, 1992). However, humans rarely adhere to the dominant strategy in simple economic games (Mailath, 1998). One potential reason why players may make this choice is that they trust that their partners will not defect before they do. Indeed, if one trusts one's partner not to defect, one's payout is likely to be significantly larger with a cooperative strategy. Therefore, the number of rounds participants choose to pass the pots is a proxy for trust behaviour.

A second advantage of using a centipede game over a commonly used Prisoner's Dilemma or similar game is that participants are less likely to be familiar with it. In a typical undergraduate sample, there is a substantial risk that participants have encountered the Prisoner's Dilemma game in a psychology class, experiment, or on television. In order to increase the likelihood that participants were naïve to the trust

measure, we opted for this less well known, yet still ecologically valid measurement of trust.

Figure 6. Participant decision screen in centipede-style game.

Here we used a 10-round version of this game (see Figure 6), in which participants played with an avatar, that they believed to be a real partner. The version used in Experiment 1 either ended when the participant defected or when the game had reached ten rounds. The avatars were programmed to defect in round 10, if the participant had not already defected. Participants knew that they would receive their game earnings as a monetary bonus at the end of the experimental session. We manipulated similarity and reciprocity using the method described in Chapter 2.

3.2.3 Data Analysis

To examine trustworthiness, we tallied the number of rounds participants chose to pass the pots of points to each avatar. To test our hypotheses regarding the main effects of similarity and social reciprocity on trust behaviours we conducted a 2 x 2 repeated measures factorial ANOVA with avatar similarity (high, low) and avatar reciprocity (high, low) as the independent variables and total passes as the dependent variable.

3.3 Results

To ensure that manipulated level objective similarity enhanced perceptions of similarity, we conducted a 2 x 2 repeated measures ANOVA with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the degree to which participants rated avatars as “similar to me” as the dependent variable revealed that participants rate high similarity avatars as more similar to themselves than low similarity avatars, F (1, 55) = 34.03, $p < .001$, $\eta_\rho^2 = .382$ (see Figure 7). There was no significant relationship between avatar reciprocity and similarity ratings, F (1, 55) = 3.89, $p = .054$, $\eta_\rho^2 = .066$, nor was there any interaction between the variables, F (1,55) = .054, $p = .818$,

η_p^2 = .001. Though nonsignificant there does seem to be a trend for participants to rate highly reciprocal avatars as more similar to themselves than low reciprocity avatars.

We also conducted a series of Pearson Correlations between self-rated personality and the avatar personality ratings to determine if highly similar avatars are rated as more similar to the self. Correlations between the low similarity, low reciprocity avatar and the self are predominantly non-significant (with the exception of extraversion), though trending in the negative direction (Extraversion: r = -.36, *p* = .007; Agreeableness: r = -.02, *p* = .874; Conscientiousness: r = -.15, *p* = .287; Emotional Stability: r = -.11, *p* = .419; Openness: r = -.08, *p* = .557). Correlations between the low similarity, high reciprocity avatar and the self follow the same trend as above (Extraversion: r = -.52, *p* < .001; Agreeableness: r = .07, *p* = .625; Conscientiousness: r = -.14, *p* = .297; Emotional Stability: r = .00, *p* = .983; Openness: r = -.04, *p* = .751). Correlations between the high similarity, low reciprocity avatar and the self are predominantly non-significant (with the exception of agreeableness), though trending in the positive directions (Extraversion: r = .00, *p* = .996; Agreeableness: r = .28, *p* = .037; Conscientiousness: r = .20, *p* = .135; Emotional Stability: r = .13, *p* =.349; Openness: r = .18, *p* = .194). Correlations between the high similarity, high reciprocity avatar and the self are non-significant, though predominantly trending in the positive direction (Extraversion: r = .18, *p* = .193; Agreeableness: r = .13, *p* = .352; Conscientiousness: r = -.04, *p* = .782; Emotional Stability: r = .22, *p* = .104; Openness: r = .04, *p* = .786). These results, along with the results from the 2 x 2 ANOVA above suggest that our similarity manipulation achieved its desired effect.

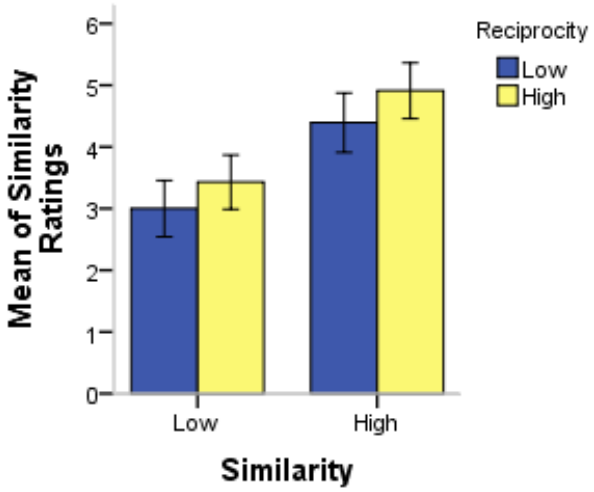

Figure 7. Manipulation check for similarity. Participants rate the highly similar avatars as more similar to themselves than the less similar avatars. Error bars show the 95% confidence intervals.

A second 2 x 2 repeated measures ANOVA with similarity (low or high) and social reciprocity (low or high) as within subject factors and the total rounds played with each avatar as the dependent variable, revealed both a main effect of similarity, F (1, 55) = 7.42, p = .009, η_ρ^2 = .119, and a main effect of social reciprocity, F (1,55) = 11.75, p = .001, η_ρ^2 = .176 (see Figure 8a). In both cases, consistent with hypotheses, higher levels of similarity and reciprocity lead to greater trust. The similarity by social reciprocity interaction was non-significant, F (1,55) = 1.59, p = .213, η_ρ^2 = .028, suggesting that these effects are independent.

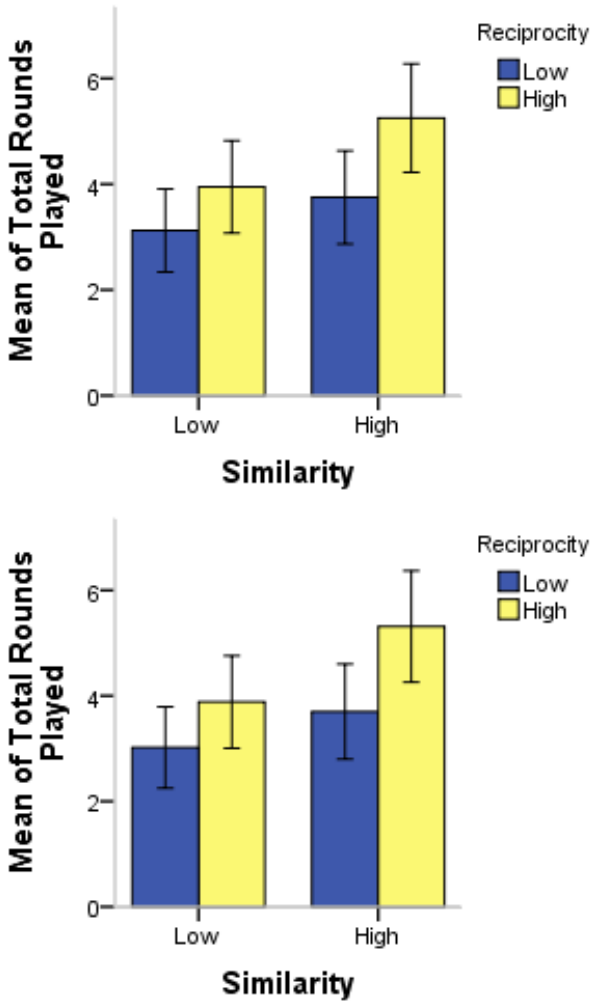

Figure 8. Main effects of similarity and social reciprocity. Participants play more rounds with avatars who are highly similar and highly reciprocal in comparison to those who are low in similarity and reciprocity. (a) Analysis on 56 participants, (b) analysis on 50 participants. Error bars show the 95% confidence intervals

Interestingly, a number of participants (N = 3) opted to defect on all avatars in Round 1 (i.e., they played the dominant strategy). However, because the game with any given avatar ended when the participant defected, an alternate explanation for these results might be that savvy research-pool-recruited participants were simply attempting to end their testing sessions early. To examine this possibility, we repeated the analysis excluding any participant who defected on the first trial with all four avatars. To balance this, we also excluded any participant who stayed in the game for all 10 rounds with all four avatars, as these participants may not have understood the task (N = 3). This analysis therefore included 50 participants. As

above, we found a significant main effect of similarity, F (1, 49) = 7.52, p = .008, η_ρ^2 = .133, and a significant main effect of social reciprocity, F (1, 49) = 12.03, p = .001, η_ρ^2 = .197. The similarity by social reciprocity interaction was non-significant, F (1, 49) = 1.59, p = .213, η_ρ^2 = .031. Thus, these results suggest that similarity and social reciprocity indeed contribute to trust decisions independently of one another (see Figure 8b).

3.4 Discussion

Taken together, these results support both of our hypotheses. We found significant main effects of both similarity and social reciprocity on trust behaviour. Specifically, people are more trusting of those who express similar preferences and whose behaviour demonstrates greater levels of social reciprocity than they are of people who are less similar and behave less reciprocally. The lack of an interaction effects suggest that similarity and social reciprocity operate independently in terms of their contributions to trust decisions.

These data therefore suggest that in addition similarity, which is a well-established predictor of trust, social reciprocity independently contributes to these decisions. However, one limitation of this study was that some participants may have quickly realized that defection was a way to shorten the study session. This means that after an initial defection, participants might have opted to defect in order to avoid completing more trust trials. In order to ensure that such experiment-levels variables did not explain the results, we conducted a second set of experiments, using a different measure of trust.

Chapter 4

4 Experiment 2

4.1 Introduction

This experiment replicates findings from Experiment 1 using a different economic game. The aim of Experiment 2 is therefore twofold. First, we sought to resolve limitations in Experiment 1 by choosing an "investor-trustee" game (Berg, Dickhaut, & McCabe, 1995) in which participants must complete all rounds but may vary their economic strategies depending on their opponent. Second, we aimed to determine whether the effect of social reciprocity as a predictor of trust behaviour is robust by examining whether it replicates in another task context.

The investor-trustee game is an economic game that is often used in psychological research (e.g., King-Casas, et al., 2005; Kosfeld, Heinirchs, Zak, Fischbacher, & Fehr, 2005; Shore & Heerey, 2013). In the typical version of this game, the "investor" receives an endowment and must then choose how much of the endowment to invest with a "trustee." If money is invested, the trustee receives a "matured" investment. In typical games, the matured amount is typically triple the original investment (Berg, Dickhaut, & McCabe, 1995). The trustee then chooses how much of the investment to return to the investor. Thus, the amount invested indicates the degree to which the investor trusts the trustee and the return indicates the trustee's actual trustworthiness. In addition to the initial replication experiment (here labeled Experiment 2a) we also completed a direct replication of this task (Experiment 2b) to ensure the reliability of our results.

4.1.1 Hypotheses

As above, we predicted significant and independent main effects of both similarity and social reciprocity on trust behaviour, such that greater levels of both similarity and reciprocity will enhance trust, as measured by investments in an iterated version of the investor-trustee game. The hypotheses for Experiment 2b were pre-registered on the Open Science Framework (OSF; Heerey & Clerke, 2017 (osf.io/dv7np)).

4.2 Experiment 2a and b

4.2.1 Methods

4.2.1.1 Participants

4.2.1.1.1 Experiment 2a

Seventy-four participants completed this study in exchange for partial course credit and a small monetary bonus, which was based on their performance in the investor-trustee game. Of these 74, 9 were discarded from the analysis due to deception failure (they did not believe they had played real participants). The final sample therefore included sixty-five undergraduate participants (17 male, mean age = 18.63, *SD* = .86).

4.2.1.1.2 Experiment 2b

Eighty-five participants completed this study in exchange for partial course credit and a small monetary bonus, which was based on their performance in the investor-trustee game. Of these 85, 13 were discarded from the analysis due to deception failure. The final sample therefore included seventy-two participants (19 male, mean age = 18.70, *SD* = 1.14).

4.2.1.2 Procedures

Here we used a 10-round version of this game in which each participant played 5 rounds as the investor and 5 rounds as the trustee with each avatar (see Figure 9). Asking participants to play both game roles allowed us to both maintain the deception that they played real partners and allowed us to examine differences in both trusting behaviour and trustworthiness for each participant. As in Experiment 1, participants believed that the avatar was a real partner. They played all game rounds in random order and without feedback, meaning that they did not know what portion of their investment had been returned to them when they played the investor role. We did this to ensure that the presence of feedback did not shape

Figure 9. Example of a turn of the investor-trustee game.

subsequent trials. In the investor role, participants received a 10-point endowment and chose what proportion to invest with their partner on the round. We allowed participants to choose from the full range of the endowment (0% to 100%).

When the participant played the trustee role, they chose what proportion of the matured investment to return to their partner, ranging from 0% to 100%. To ensure that participants' behaviour was not affected by differential investment amounts across the avatars, we controlled this variable. Over the course of the five trustee-role trials with each avatar, participants received investments of 3 points, 4 points, 5 points, 6 points and 7 points. These trial orders were fully randomized to minimize the chance of participants guessing the nature of our manipulation. Debriefing data confirmed that no participant guessed this manipulation. Finally, participants knew that they would receive their game earnings as a monetary bonus at the end of the experimental session.

Prior to the investor trustee game, we manipulated similarity and reciprocity using the method described in Chapter 2.

4.2.1.3 Data Analysis

To examine participants' beliefs about avatar trustworthiness, we calculated the average number of points that a participant invested with each avatar. We also calculated the proportion of the original investment that a participant returned to each avatar when in the trustee role. These data served as the dependent variables in our analyses

4.2.2 Results

4.2.2.1 Experiment (2a)

To test whether our similarity and social reciprocity manipulation effectively altered perceptions of similarity and feelings of being "in sync," we conducted two 2 x 2 repeated measures ANOVAs with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the degree to which participants rated avatars as "similar to me" and "in sync with me" as the dependent variables, respectively. Results from the first ANOVA revealed that participants rated high similarity avatars as more similar to themselves than low similarity avatars, F (1, 58) = 13.90, $p < .001$, $\eta_p^2 = .193$,

and that they rated high reciprocity avatars as more similar to themselves than low reciprocity avatars, F (1, 58) = 16.73, p < .001, η_ρ^2 = .224 (see Figure 10). There was no significant interaction between the two variables, F (1, 58) = .67, p = .416, η_ρ^2 = .011. These results suggest that although our manipulation of similarity achieved its desired effect, it was jointly influenced by the reciprocity manipulation. Results from the second ANOVA revealed that participants rated highly reciprocal avatars as more in sync with themselves than low reciprocity avatars, F (1, 58) = 31.81, p < .001, η_ρ^2 = .354, and that participants rate highly similar avatars as more in sync with themselves than low similarity avatars, F (1, 58) = 15.38, p < .001, η_ρ^2 = .210. There was also a significant interaction between the two variables, F = (1, 58) = 4.64, p = .035, η_ρ^2 = .074, which suggests that the highly similar and highly reciprocal avatar is rated as most in sync and the low similar, low reciprocity avatar as least in sync with the participants (see Figure 10). These results suggest that although our reciprocity manipulation achieved its desired effect, it was influenced by our similarity manipulation. Ratings on the similarity and social reciprocity manipulation checks are significantly correlated with one another, r = .79, p < .001.

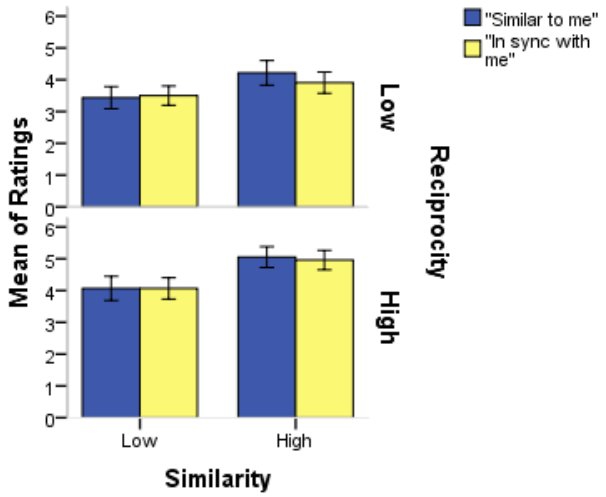

Figure 10. Manipulation check for similarity and social reciprocity. Participants rate the highly similar and reciprocal avatars as more similar to and in sync with themselves than the less similar and reciprocal avatars. Error bars show the 95% confidence intervals.

We also conducted a series of Pearson Correlations between self-rated personality and the avatar personality ratings to determine if highly similar avatars are rated as more similar to the self. Correlations between the low similarity, low reciprocity avatar and the self were non-significant (with the exception of openness; Extraversion: r = -.02, p = .896; Agreeableness: r = .16, p = .200; Conscientiousness: r = .02, p = .854; Emotional Stability: r = .14, p = .263; Openness: r = .26, p = .037). Correlations between the low

similarity, high reciprocity avatar and the self are largely non-significant, with the exception of agreeableness (Extraversion: r = -.10, *p* = .420; Agreeableness: r = .26, *p* = .040; Conscientiousness: r = .00, *p* = .943; Emotional Stability: r = .03, *p* = .817; Openness: r = .05, *p* = .705). Correlations between the high similarity, low reciprocity avatar and the self are predominantly non-significant (with the exception of agreeableness), though mostly trending in the positive direction (Extraversion: r = -.06, *p* = .610; Agreeableness: r = .25, *p* = .049; Conscientiousness: r = .06, *p* = .638; Emotional Stability: r = .15, *p* =.231; Openness: r = .08, *p* = .547). Correlations between the high similarity, high reciprocity avatar and the self are predominantly non-significant (with the exception of agreeableness and openness), though mostly trending in the positive direction (Extraversion: r = -.02, *p* = .882; Agreeableness: r = .39, *p* = .001; Conscientiousness: r = .226, *p* = .070; Emotional Stability: r = .05, *p* = .712; Openness: r = .318, *p* = .010). These results suggest that participants were more likely to rate high similarity avatar the same way they rated themselves, though not significantly.

Another 2 x 2 repeated measures ANOVA with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the average points invested with each avatar as the dependent variable, revealed both a main effect of similarity, F (1, 64) = 6.59, p = .013, η_ρ^2 = .093, and a main effect of social reciprocity, F (1, 64) = 6.28, p = .015, η_ρ^2 = .089 (see Figure 11a). In both cases, consistent with hypotheses, higher levels of similarity and reciprocity lead to greater trust. The similarity by social reciprocity interaction was non-significant, F (1, 64) = .33, p = .570, η_ρ^2 = .005, suggesting that these effects are independent.

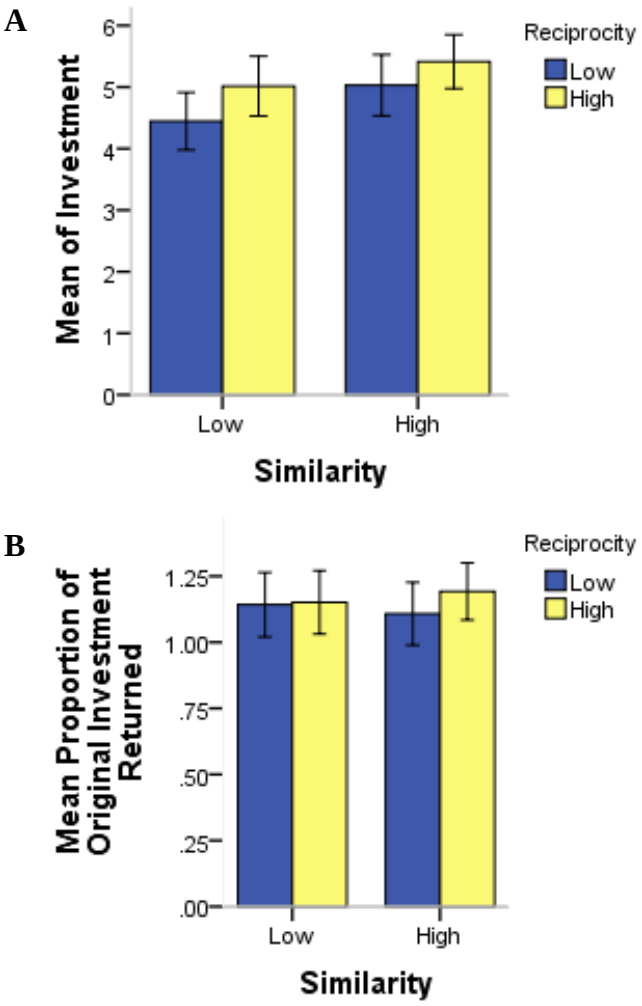

Figure 11. Effects of similarity and social reciprocity. (a) Participants invest more with highly similar and highly reciprocal avatars then with avatars who are low in similarity and social reciprocity. (b) Participants returned a greater proportion of the initial investment to highly reciprocal avatars. This effect is amplified when similarity is also high. Error bars show the 95% confidence intervals.

An exploratory 2 x 2 repeated measures ANOVA with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the average proportion of points returned to each avatar as a dependent variable revealed a main effect of social reciprocity, F (1, 64) = 4.82, p = .032, η_ρ^2 = .070, and a significant interaction between similarity and social reciprocity, F (1, 64) = 4.51, p = .038, η_ρ^2 = .066. There was no significant main effect of similarity, F (1, 64) = .031, p = .861, η_ρ^2 = .000 (see Figure 11b).

4.2.2.2 Experiment 2b

We tested the effectiveness of our similarity and social reciprocity manipulations in the same way it was described in Experiment 2a. The 2 x 2 repeated measures ANOVA that had the degree to which participants rated the avatars as "similar to me" as the dependent variable revealed that participants rate highly similar avatars as more similar to themselves than low similarity avatars, F (1, 71) = 60.16, $p < .001$, $\eta_\rho^2 = .459$, and that participants rate highly reciprocal avatars as more similar to themselves than low reciprocity avatars, F (1, 71) = 4.35, $p = .041$, $\eta_\rho^2 = .058$. There was no significant interaction between the two variables, F (1, 71) = .26, $p = .609$, $\eta_\rho^2 = .004$. This suggests that, as above, although our similarity manipulation had the desired effect but it was influenced by our social reciprocity manipulation as well. The 2 x 2 repeated measures ANOVA that had the degree to which participants rated the avatars as "in sync with me" as the dependent variable revealed that participants did not rate highly reciprocal avatars as more in sync with themselves than low reciprocity avatars, F (1, 71) = 2.64, p =.109, η_ρ^2 = .036, and that participants do rate highly similar avatars as more in sync with them than low similarity avatars, F (1, 71) = 31.00, $p < .001$, $\eta_\rho^2 = .304$. There was no significant interaction between the two variables, F (1,71) = .75, $p = .390$, $\eta_\rho^2 = .010$. These results suggest that participants may not have attended to our social reciprocity manipulation to the same degree as in other experiments. Ratings on the similarity and social reciprocity manipulation checks are significantly correlated with one another, r = .79, $p < .001$.

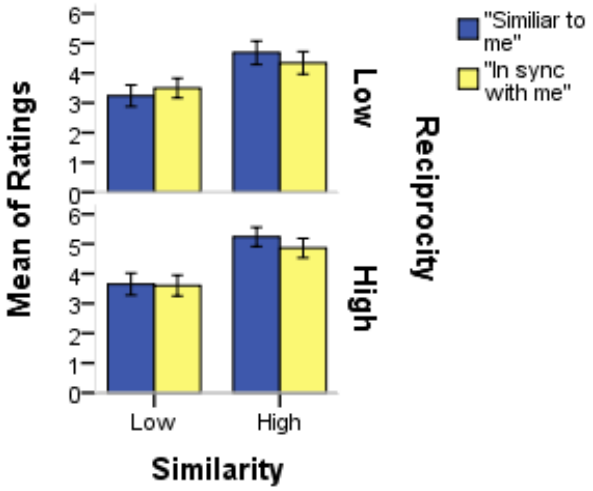

Figure 12. Manipulation check for similarity and social reciprocity. Participants rate highly similar and highly reciprocal avatar as more similar to themselves than avatars who are low in similarity and reciprocity. Participants rate highly similar avatars as more in sync with themselves but not highly reciprocal avatars in comparison to avatars that are low on these variables. Error bars show the 95% confidence intervals.

Like above, we conducted a series of Pearson Correlations between self-rated personality and the avatar personality ratings to determine if highly similar avatars are rated as more similar to the self. Correlations between the low similarity, low reciprocity avatar and the self are predominantly non-significant (with the exception of extraversion), though trending in the negative directions (Extraversion: r = -.25, p = .031; Agreeableness: r = -.07, p = .583; Conscientiousness: r = -.05, p = .698; Emotional Stability: r = -.07, p = .536; Openness: r = -.16, p = .168). Correlations between the low similarity, high reciprocity avatar (Extraversion: r = -.05, p =.691; Agreeableness: r = -.09, p = .467; Conscientiousness: r = -.05, p = .672; Emotional Stability: r = .04, p = .742; Openness: r = -.15, p = .202) and the high similarity, low reciprocity avatar (Extraversion: r = -.19, p = .166; Agreeableness: r = .20, p = .086; Conscientiousness: r = .15, p = .208; Emotional Stability: r = .20, p =.085; Openness: r = .10, p = .422) are non-significant. Correlations between the high similarity, high reciprocity avatar and the self are predominantly non-significant (with the exception of extraversion and openness) though trending in the positive direction (Extraversion: r = .25, p = .037; Agreeableness: r = .21, p = .079; Conscientiousness: r = .17, p = .151; Emotional Stability: r = .15, p = .217; Openness: r = .36, p = .002). These results suggest that participants are rating the high similarity and high reciprocity avatar as more similar to the self.

Another 2 x 2 repeated measures ANOVA with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the average points invested with each avatar as the dependent variable revealed both a main effect of similarity, F (1,71) = 13.46, $p < .001$, $\eta_p^2 = .159$, and of social reciprocity, F (1, 71) = 8.10, p = .006, η_p^2 = .102. There was no significant interaction between the two variables, F (1, 71) = .10, p = .749, $\eta_p^2 = .001$. These data are consistent with the Experiment 2a results.

A final exploratory 2 x 2 repeated measures ANOVA with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the average proportion of points returned to each avatar as the dependent variable revealed no significant main effects of similarity, F (1,71) = 3.70, p = .058, η_ρ^2 = .050, or social reciprocity, F (1,71) = .04, p = .848, η_ρ^2 = .001. There was no significant interaction between the two variables, F (1,71) = .65, p = .425, η_ρ^2 = .009.

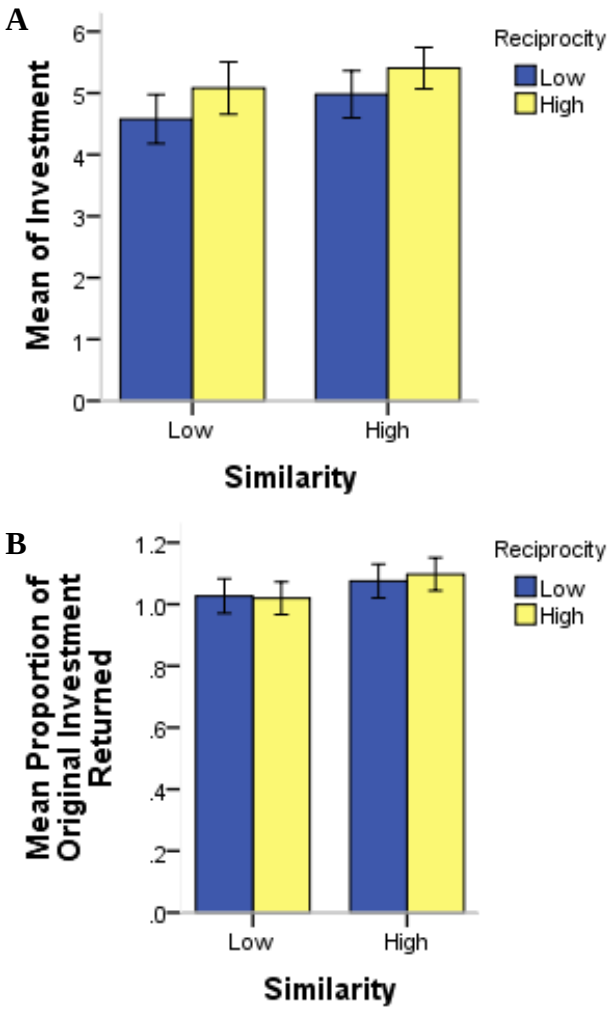

Figure 13. Effects of similarity and social reciprocity. (a) Participants invest more with avatars who are highly similar and high in reciprocity in comparison to avatars who are low in similarity and social reciprocity. (b) Participant's own trustworthiness is not effect by the similarity or reciprocity levels of the avatars. Error bars show the 95% confidence intervals.

4.2.3 Discussion

Taken together, these results support both of our main hypotheses. We found significant main effects of both similarity and social reciprocity on trust behaviour, as in Experiment 1. Specifically, people trust those who are higher similarity and reciprocity than people who are lower in similarity and reciprocity. However, when we examined the degree to which our participants behaved in a trustworthy manner themselves, we saw only reciprocity emerge as a factor, along with a similarity by reciprocity interaction in Experiment 2a. In Experiment 2b, the trustworthiness of participants' own behaviour was not affected by avatar similarity or reciprocity levels.

Chapter 5

5 Experiment 3

5.1 Introduction

This experiment aimed to replicate the findings of Experiments 1 & 2 using social rather than financial decisions. Thus, the purpose of this experiment was to test the robustness of similarity and social reciprocity as predictors of trust behaviour in social scenarios. In addition, this experiment sought to further disentangle the contributions of similarity and reciprocity to trust decisions. Recall that in our manipulation (see Chapter 2), similarity and reciprocity are fully crossed (i.e., each avatar's behaviour is either high or low on similarity and likewise on reciprocity. The high similarity/high reciprocity avatar appeared to be the most trustworthy across the data sets. Thus, participants' decisions may reflect the additive value of similarity and reciprocity together. This makes it somewhat difficult to determine how these variables independently contribute to choice behaviour.

Here, we use an idea from expected utility theory (von Neumann & Morganstern, 1947) to disentangle these effects. Specifically, we ask how participants apportion their choices across pairs of avatars, depending on how those avatars differ in similarity and reciprocity. This method essentially uses a "transitivity" task to examine the strength of participants' preferences across the decision space. This means that we ask participants to make a decision using information they have already learned about each avatar. Based on participants' decisions, we then model the degree to which avatar similarity and reciprocity determine the architecture of choice behaviour, or avatar utility, across a set of social trust decisions. This type of design is a common method for examining preferences within a decision space (e.g., Chung, Christopoulos, King-Casas, Ball, & Chiu, 2015; Glimcher & Rustichini, 2004; Kandasamy et al., 2014)

5.1.1 Hypotheses

As in the first two experiments, we predicted significant effects of both similarity and social reciprocity on trust decisions, such that greater levels of both similarity and

social reciprocity will enhance trust, as measured by decisions in a utility task. This experiment also has a third hypothesis that social reciprocity will contribute more to social decisions than similarity, such that social reciprocity will be a more important predictor of choices than similarity. We expect this because in real-world interactions, social reciprocity may be the first interpersonal characteristic that people notice after appearance similarity, so it is likely that it shapes our perceptions of people on a whole more so than similarity. These hypotheses were pre-registered prior to data-collection on the OSF (Heerey & Clerke, 2017 (osf.io/dv7np)).

5.2 Methods

5.2.1 Participants

Ninety-seven participants completed this study in exchange for partial course credit. Of these ninety-seven, nine were discarded from the analysis due to deception failure and five additional participants were discarded due to poor performance on the decision task. Poor performance on the decision task was defined as having made a choice in less than 350ms on 25% or more of the test trials. This data exclusion decision was made based on N400 research which suggests that at least 350-400ms is necessary for people to read and understand short phrases, like those in our decision task (Kutas & Hillyard, 1980; Kutas & Federmeier, 2011). Thus responses that are shorter than 350ms are likely to be anticipatory responding that is not representative of deliberate decision making. The final sample therefore included eighty-five undergraduate participants (23 male, mean age = 18.68, SD = 1.29).

5.2.2 Procedures

As in Experiments 1 and 2, the task began with our standard manipulation of similarity and reciprocity. In this Experiment, we measured trust using a social decision making task in which participants chose one of two avatars to engage with in a hypothetical trust scenario in each trial (e.g., who would you rather lend your car keys to, who would you ask to be your designated driver; see Figure 14a and Appendix E). The trust items were pre-rated by an independent set of participants based on 1) the extent to which each scenario affects the average university undergraduate student and 2) the extent to which the item is a good indicator of whether or not one trusts someone.

Participants viewed each of the six possible avatar pairings (see Figure 14b) for each of 14 trust items, meaning that there were 84 test trials. The placement of the avatars within each choice pair was counterbalanced so that each avatar appeared on the left and on the right side of the pairing on an equal number of trials. How participants apportion their choices across this decision space tells us how they are using the relative difference between avatar similarity and reciprocity to guide their choices.

Figure 14. Utility task. (a) Utility task decision screen. (b) Six possible avatar pairings.

5.2.3 Data Analysis

To examine the degree to which avatar similarity and reciprocity shaped choice behaviour, we individually modeled each participant's choices using a logistic model to fit the data. The model predicted the likelihood that a participant would select the avatar on the left, given the characteristics of avatar on the right. The model included terms for

avatar similarity and reciprocity, coded as the difference between the left avatar and the right one for each variable. We used a standard logistic model to fit the choice data.

$$P_{Avatar1} = \frac{EXP\ (\theta)}{1 + EXP(\theta)}$$

The parameter θ in the logistic equation was estimated as:

$$\theta = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

In this equation, the βs are the estimated, unstandardized regression weights. β_0 refers to the intercept; β_1 is the degree to which similarity influenced choice behaviour; β_2 is the estimated regression weight for social reciprocity; and β_3 is the similarity x social reciprocity interaction. The Xs in the equation represent the difference between the avatar on the left and the avatar on the right for similarity (X_1), social reciprocity (X_2), and the similarity by social reciprocity interaction (X_3). The model used an iteratively re-weighted least squared algorithm to obtain the maximum likelihood estimate for each of the terms (O'Leary, D.P., 1990). The more these values differ from zero, the greater the influence of each term on participants' decisions.

Participants' unstandardized regression weights for similarity, social reciprocity, and the similarity x social reciprocity interaction were subsequently examined using one-sample t-tests against a test value of zero. This allowed us to test whether participants used these values to guide choice behaviour in the task. To examine their relative weightings, we conducted a paired samples t-test.

5.3 Results

To test whether our manipulations of similarity and social reciprocity had their desired effect, we conducted two 2 x 2 repeated measures ANOVAs with similarity (low or high) and social reciprocity (low or high) as within subjects factors and the degree to which participants rated avatars as "similar to me" and "in sync with me" as the respective dependent variables. Results revealed that participants rated highly similar

avatars as more similar to themselves, F (1, 84) = 32.86, p < .001, η_p^2 = .281, and that participants rated highly reciprocal avatars as more similar to themselves, F (1, 84) = 25.94, p < .001, η_p^2 = .236 (see Figure 15). Results from the second analysis revealed that participants rated highly reciprocal avatars as more in sync with themselves, F (1, 84) = 16.83, p < .001, η_p^2 = .167, and that participants rated highly similar avatars as more in sync with themselves, F (1, 84) = 20.61, p < .001, η_p^2 = .197. There was no significant interaction between the two variables, F (1, 84) = 1.70, p = .196, η_p^2 = .020 (see Figure 15). Ratings on the similarity and social reciprocity manipulation checks are significantly correlated with one another, r = .76, p < .001.

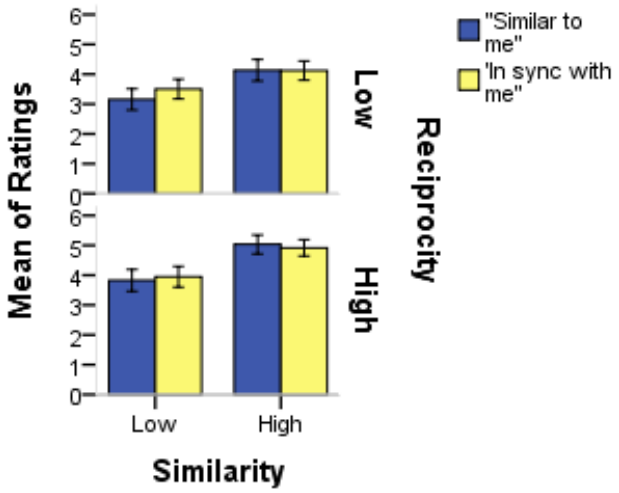

Figure 15. Manipulation check for similarity and social reciprocity. Participants rate highly similar and highly reciprocal avatars as more similar to and in sync with themselves than low similarity and low reciprocity avatars. Error bars show the 95% confidence intervals.

As in the previous experiments, we conducted a series of Pearson Correlations between self-rated personality and the avatar personality ratings to determine if highly similar avatars are rated as more similar to the self. Correlations between the low similarity, low reciprocity avatar and the self are predominantly non-significant (with the exception of extraversion and openness to experience) but are trending in the negative direction (Extraversion: r = -.31, p = .004; Agreeableness: r = -.12, p = .264; Conscientiousness: r = .15, p = .176; Emotional Stability: r = .10, p = .374; Openness: r = -.24, p = .029). Correlations between the low similarity, high reciprocity avatar and the self are non-significant (Extraversion: r = -.11, p =.319; Agreeableness: r = .182, p = .095; Conscientiousness: r = .07, p = .516; Emotional Stability: r = .06, p = .613; Openness: r = .12, p = 265). Correlations between the high similarity, low reciprocity avatar are largely non-significant, with the exception of conscientiousness (Extraversion:

r = .03, *p* = .785; Agreeableness: r = .14, *p* = .190; Conscientiousness: r = .23, *p* = .035; Emotional Stability: r = -.05, *p* =.660; Openness: r = .09, *p* = .416). Correlations between the high similarity, high reciprocity avatar and the self are also predominantly non-significant (with the exception of openness) though trending in the positive direction (Extraversion: r = .11, *p* = .307; Agreeableness: r = .05, *p* = .630; Conscientiousness: r = .20, *p* = .063; Emotional Stability: r = -.15, *p* = .170; Openness: r = .24, *p* = .031).

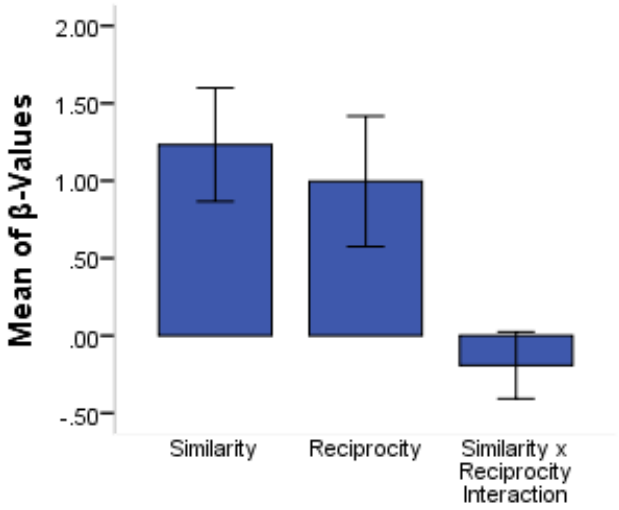

Figure 16. Effects of similarity and social reciprocity. Similarity and social reciprocity contribute equally to trust decisions. Error bars show the 95% confidence intervals.

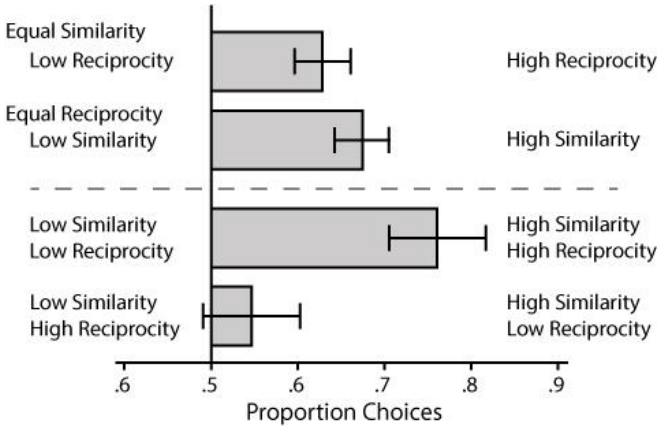

Figure 17. Probability of choice behaviour given avatar characteristics. Error bars show the 95% confidence intervals.

To test whether similarity and social reciprocity had a significant effect on trust decisions, we conducted a set of one-sample t-test with the means of the unstandardized regression weights (β-values) as the test variables. Results revealed that both similarity, *t* (84) = 6.10, *p* < .001, and social reciprocity, *t* (84) = 4.46, *p* < .001, were significantly different from zero indicating that both influenced trust decisions. The interaction between the two variables was non-significant, *t* (84) = -1.72, *p* = .090 (see Figures 16 and 17). A paired-samples t-test with the beta-values of similarity and social reciprocity as the test variables revealed

that the two variables are not significantly different from one another, t (84) = .72, p = .47. This means that similarity and social reciprocity contribute equally to trust decisions.

5.4 Discussion

These results support two of our three hypotheses. We found that, as in Experiments 1 and 2, similarity and social reciprocity both significantly affected trust decisions. Specifically, people trust those who are more similar and behave more reciprocally than people who are lower in similarity and reciprocity. However, when we examined the difference between similarity and social reciprocity in terms of their independent contributions to trust decisions, we found no significant difference. Thus, both similarity and social reciprocity contributed to trust decisions in a similar fashion. Contrary to our prediction however, reciprocity was not weighted more heavily than similarity, even though it may be apparent in real-world decisions before interaction partners know enough information about each other to make similarity judgments.

Chapter 6

6 Meta-Analyses

Meta-analyses combine data from several experiments and/or studies to better estimate the true effect of an independent variable within a population. Here, we conducted two meta-analyses of the results from Experiments 1, 2, and 3 to determine the overall effect size of similarity and social reciprocity. The meta-analysis was conducted with the statistical software package *R* (R Core Team, 2017; Viechtbauer, 2010) using Pearson's *r* coefficients as measures of effect size. We chose to use Pearson's *r* coefficient because it is one of the easier effect size metrics to interpret given that it

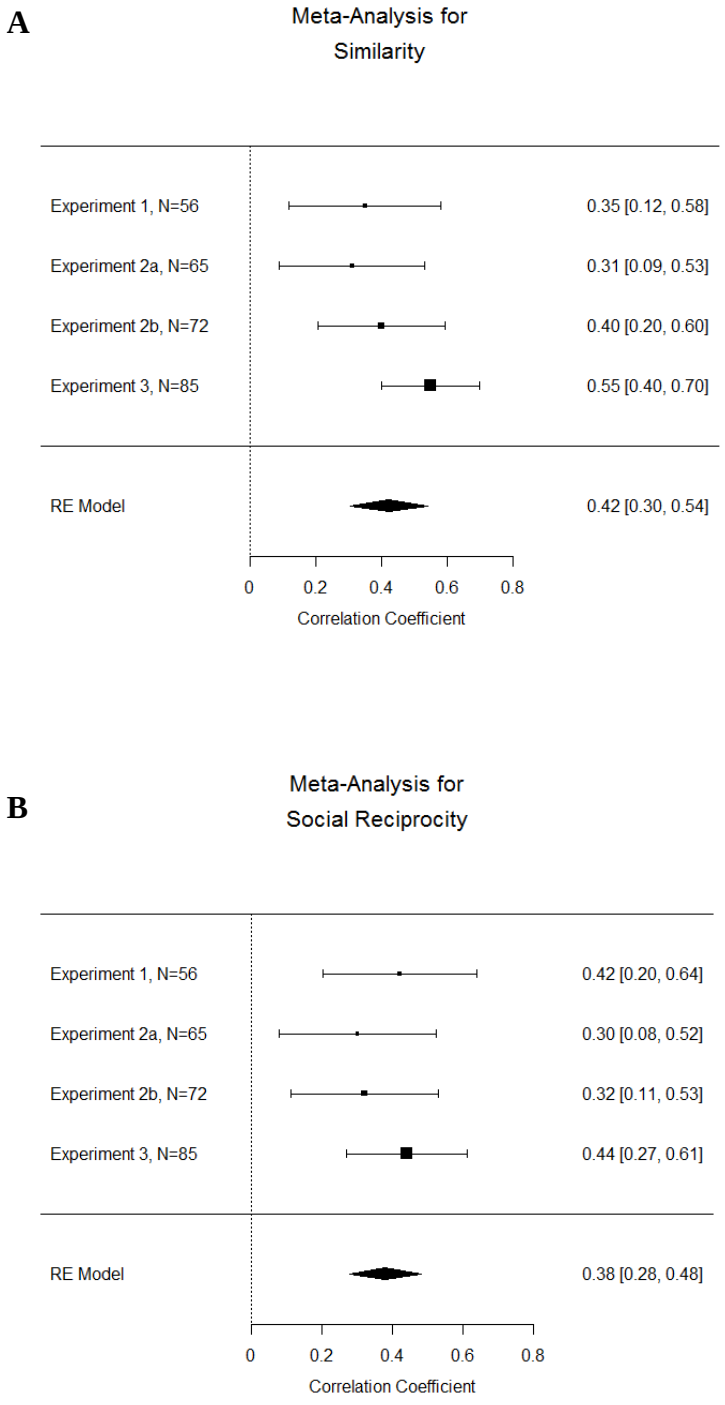

Figure 18. Meta-analyses. (a) Meta-analysis of the similarity effect across experiments. (b) Meta-analysis of the reciprocity effect across experiments.

ranges from 0 to ±1.The first meta-analysis (see Figure 17a) revealed that the overall effect for the main effect of similarity across studies was r = .42 (CI: 0.30 to .54). The second meta-analysis (see Figure 17b) revealed that the overall effect for the main effect of social reciprocity across studies was r = .38 (CI: .28 to .48). Thus, results show that there is a consistent effect for both similarity and reciprocity as predictors of trust development.

These findings support our hypotheses across the set of experiments as a whole. They also indicate that the effect sizes for both similarity and reciprocity are comparable in strength. Together, these results indicate that models of trust development must account for social reciprocity, in addition to similarity across participants.

Chapter 7

7 General Discussion

Experiments 1 and 2 reliably demonstrate that similarity and social reciprocity are important contributors to financial trust decisions. Moreover, they demonstrate that these two variables operate independently (i.e. there is no significant interaction). Experiment 2a also showed that people behave in a more trustworthy fashion themselves when their interaction partners are high in social reciprocity. Interestingly, this effect did not generalize to similarity. In Experiment 2b, there was no effect of similarity or social reciprocity on participant's own trustworthiness, although this may have been related to the weak manipulation check results. Experiment 3 additionally shows that after controlling for one another, similarity and social reciprocity both contribute equally and significantly to decisions to trust in social contexts.

The notion that similarity and social reciprocity both contribute equally to decisions to trust is important, given that previous work has almost entirely conceptualized similarity, in appearance, group membership or attitudes, as the largest contributor to these decisions (e.g., DeBruine, 2002; Goette, Huffman, & Meier, 2006; MacDonald, Schug, Chase, & Barth, 2013; Williams, 2001; Ziegler & Golbeck, 2007). One reason why the literature has conceptualized similarity as singularly important is that similarity is easier to manipulate and measure in both experimental and observational contexts than social reciprocity (Diehl 1990; Heerey, 2015). However, in real-world interactions, social reciprocity may be apparent before anything other than physical similarity. That is, interaction partners must interact in some fashion in order to learn that they have similar interests, attitudes, beliefs, etc. This interaction necessarily involves the exchange of contingent social cues (Cialdini & Golstein, 2004; Heerey & Crossley, 2013). Thus, social reciprocity has temporal precedence over similarity in the real world.

It is probable that high levels of social reciprocity during interaction shapes how people interpret the level of similarity between themselves and an interaction partner. For example, manipulation check findings from Experiments 2 and 3 suggest that high levels

of social reciprocity influence perceived levels of similarity, such that people perceive highly reciprocal avatars as more similar to themselves than avatars that engage in less social reciprocity. This suggests that social reciprocity, which makes interactions feel smoother and more fluent (Delaherche et al., 2012), may have heuristic value as an indicator of similarity. When interactions feel more fluent, interaction partners perceive more similarity, which then leads to higher levels of trust. Thus, reciprocity may be a nonverbal indicator of similarity, which people interpret as trustworthiness.

From a theoretical perspective, this idea makes sense as reciprocity can be defined as the contingent exchange of social cues, which implies a similarity of interaction style. Without expected levels of reciprocity, people's interaction styles may lead to greater disfluency and awkwardness. Both interpersonal similarity and social reciprocity have been linked to smoothness and comfort of an interaction, which indicates that both may be necessary for a successful interaction (Byrne, 1971; Delaherche, et al., 2012). This may be because the two variables are tightly linked with one another, meaning that they may be perceived as a joint aspect of person perception.

Social reciprocity may also change the way people actively acquire social information. For example, if reciprocity is high, people may feel that their initial interactions are smoother and more coordinated and experience this as positive or rewarding (Delaherche et al., 2012). They may subsequently seek out points of similarity between themselves and their interaction partners, as similarities in interests and attitudes may form the foundation of friendships by providing a source of common ground (Youyou, et al., 2017). This could mean that people perceive others as more similar to themselves even when objectively similarity levels are lower. This is consistent with the notion that similarity need not be objective to enhance trust (Sanders et al., 2015; Whitmore & Dunsmore, 2014). Thus, social reciprocity may underpin similarity perception and consequently shape trust decisions.

Even though reciprocity may shape perceptions of similarity, our data suggest that perceived similarity reliably influences decisions to trust, meaning that it is still an important factor in longer-term relationships in which people get to know one another

more deeply. However, in minimal interactions between strangers, it is plausible that social reciprocity acts as a guiding heuristic for trust-based decisions because reciprocity may be more immediately available in real social encounters. However, when people have the opportunity to get to know one another, perceived similarity is likely influenced by variables other than reciprocity, which demonstrates the independent contribution of perceptions of similarity.

Both similarity and social reciprocity may be influencing trust-based decisions via a fluency effect. Specifically, information about similarity and reciprocity, which is more readily available than information about actual trustworthiness, become a proxy measure of interpersonal trustworthiness. This may be especially true in the short-interactions between strangers that are commonplace in the experimental setting in which this work is based. For instance, in a five-minute interaction there are many instances where social reciprocity and similarities may become apparent but this is less likely for trustworthiness. Further, given that similarity and social reciprocity are commonplace in interactions (Oullier, de Guzman, Jantzen, Lagarde, & Kelso, 2008; Wheeler & Miyake, 1992), people are likely to be good at detecting and interpreting these cues. Thus, people likely interpret similarity and reciprocity as cues, in comparison to trustworthiness, due to the ease and fluency associated with their processing.

7.1 Implications

Trust is the cornerstone of all interpersonal relationships, which means that understanding the basis for trust formation provides insight to the basis of relationship formation. Thus, from this set of experiments, we have learned that both high levels of similarity and social reciprocity are crucial to the development of successful relationships. While the idea of similarity being important in relationships has been around for a while, the results have been inconsistent (Luo & Zhang, 2009; Youyou et al., 2017). Reciprocity of liking has been stated to influence relationships but little work has been done to suggest that reciprocity of social cues plays an important role as well. This may be because the concept of fluidity of social interactions is rarely considered outside of clinical lore and a small body of literature describing social interaction from an ethnographic perspective. However, in normal functioning this reciprocity also matters.

Because it is so frequent (Oullier et al., 2008), people may come to expect its presence (Heerey, 2015; Heerey & Crossley, 2013). When reciprocity is disrupted or does not occur at expected rates, it may be perceived as offputting and indicate to the receiver that this interaction partner should be passed over in favour of more fruitful partners. To the extent that they are non-overlapping constructs, similarity may serve similar purposes. Nonetheless, this set of experiments provides high powered evidence to suggest that similarity and social reciprocity do indeed shape social outcomes.

This work also speaks to the need to reconsider similarity as the main (or possibly only) predictor of trust behaviour, especially in the context of trust development in stranger interactions or in new relationships. Given that social reciprocity often has temporal precedence over similarity it is likely that reciprocity of social cues impacts impressions of trustworthiness before similaritiy and that these cues shape interpretations of similarity. This may mean that reciprocity is really the driving factor behind both of these effects.

7.2 Limitations

One obvious limitation of this set of experiments is that it describes "interactions" that were completely computer controlled. However, this is the only way to tightly control and manipulate social cues and information without the use of confederates, who are prone to their own sources of error including memory limitations and fluctuations in behaviour across experimental sessions and task conditions (e.g., Kuhlen & Brennan, 2013). Nonetheless, even though these avatar interactions were not as realistic as true interactions, all the participants we included in our analyses genuinely believed they had interacted with other people. The fact that we observed such consistent results even in the minimal social context of the present research, suggests that these interactions are an excellent proxy for real face-to-face behaviour, which we simply do not have the ability to manipulate cleanly. Moreover, true manipulation of objective similarity and social reciprocity is the only way to determine the degree to which such variables are causally important in determining trust judgments. Here, we can confidently say that higher levels of objective similarity and social reciprocity caused increases in trust behaviour and that

these results demonstrate the importance of incorporating both variables in explorations of the underpinnings of trust-based decision-making.

The second limitation of this set of experiments is that we used convenience samples of participants from Western's undergraduate research pool. Although these students may not be representative of the general population in many respects (Peterson, 2001), in the context of online social behaviour, they are probably quite a good test sample as they are generally frequent social media users and therefore conduct a large proportion of their social lives online (Lenhart, Purcell, Smith, & Zickuhr (2010). Given that this project is proof of concept work, a convenience sample of this type is justifiable.

The final limitation of this work is that although the manipulation we used allows us to conclude that similarity and reciprocity are important and independent predictors of trust, it does not allow us to determine the relationship between them. We have argued that reciprocity may precede perceptions of similarity and trust or that it may act to enhance interaction "fluency," such that people perceive similarity even when it is lacking in an objective sense. Our data do not, however, allow us to speak to the natural relationships between these variables, which will be important to disentangle in both experimental and observational contexts.

7.3 Future Directions

Given that our work has not been able to disentangle the effects of similarity and social reciprocity, an important future direction is to determine the relationship between perceptions of similarity and the presence of social reciprocity. The fact that our data showed that both reciprocity and objective similarity predicted perceived similarity, suggests that the relationship between these variables may be more complicated than previous research, our own included, has been able to examine. We have argued that reciprocity may precede perceptions of similarity by changing people's experience of an interaction. However, to truly understand these effects, we must design an experimental manipulation that tests the foundations of these relationships.

Another important direction now that we have determined that social reciprocity independently contributes to trust decisions in an experimental context will be to determine whether these results are replicable in a naturalistic interaction. Specifically, it will be important to determine whether greater instances of unmanipulated social reciprocity in face-to-face interaction produce increases in trust behaviour. Indeed, there are a number of interesting negotiation games (e.g., van den Assem, van Dolder, & thaler, 2010) that will allow us to examine the relationship between reciprocity and trust in face-to-face contexts. If these effects exist in real-world interactions, then we can be sure that reciprocity really does play a crucial role in trust decisions. Otherwise, these effects lack ecological validity, which may be a critical weakness of the similarity and trust research.

7.4 Conclusion

Trust is an important aspect of all interpersonal relationships. These data demonstrate that people trust others more when they are highly objectively similar and engage in high levels of social reciprocity. Thus, both social reciprocity and similarity are likely to be important precursors to the feelings of trust that underpin relationship development. Given that successful interpersonal relationships are key to social life and well-being (Siedlecki, Salthouse, Oishi, & Jeswani, 2013; Valkenburg, Peter, & Schouten, 2006, understanding what leads to successful versus unsuccessful relationships is crucial. Here, we have reliably demonstrated that similarity and social reciprocity are two such variables that lead to trust and thereby contribute to interpersonal relationship development.

References

Andersson, L.M., & Pearson, C.M. (1999). Tit for tat? The spiraling effect of incivility in the workplace. *Academy of Management Review, 24,* 452-471. doi: 10.5465/AMR.1999.2202131

Appiah, O., Knobloch-Westerwick, S., & Alter, S. (2013). Ingroup favoritism and outgroup derogation: Effects of news valence, character race, and recipient race on selective new reading. *Journal of Communication, 63,* 517-534. doi: 10.1111/jcom.12032

Axelrod, R. (1980). More effective choice in the prisoner's dilemma. *Journal of Conflict Resolution, 24,* 379-403. doi: 10.1177/002200278002400301

Bagues, M., & Perez-Villadoniga, M.J. (2013). Why do I like people like me? *Journal of Economic Theory, 148,* 1292-1299. doi: 10.1016/j.jet.2012.09.014

Balliet, D., & Wu, J., & DeDreu, C.K.W. (2014). Ingroup favoritism in cooperation: A meta-analysis. *Psychological Bulletin, 140,* 1556-1581. doi: 10.1037/a0037737

Behrens, T.E.J., Hunt, L.T., & Rushmore, M.F.S. (2009). The computation of social behaviour. *Science, 324,* 1160-1164. Doi: 10.1126/science.1169694

Behrens, T.E.J., Hunt, L.T., Woolrich, M.W., & Rushworth, M.F.S. (2008). Associative learning of social value. *Nature, 456,* 245-249. doi: 10.1038/nature07538

Berg, J., Dickhaut, J., & McCabe, K. (1995). Trust, reciprocity, and social history. *Games and Economic Behaviour, 10,* 122-142. doi: 10.1006/game.1995.1027

Bernieri, F., Davis, J., Rosenthal, R., & Knee, C. (1994). Interactional synchrony and rapport: Measuring synchrony in displays devoid of sound and facial affect. *Personality and Social Psychology Bulletin, 20,* 303-311. doi: 10.1177/0146167294203008

Brülhart, M., & Usunier, J-C. (2012). Does the trust game measure trust? *Economic Letters, 115,* 20-23.

Burnham, T., McCabe, K., & Smith, V.L. (2000). Friend-or-foe intentionality priming in an extensive form trust game. *Journal of Economic Behaviour & Organization, 43,* 57-73. doi: 10.1016/S0167-2681(00)00108-6

Byrne, D.G. (1971). The attraction paradigm. New York: Academic Press.

Campbell, L., Chin, K., & Stanton, S.C.E. (2016). Initial evidence that individuals for new relationships with partners that more closely match their ideal preferences. *Collbra, 2*(1), 2. doi: 10.1525/Collabra.24

Chartrand, T.L., & Bargh, J.A. (1999). The chameleon effect: The perception-behaviour link and social interaction. *Journal of Personality and Social Psychology, 76,* 893-910. doi: 10.1037/0022-3514.76.6.893

Chartrand, T.L., & Lakin, J.L. (2013). The antecedents and consequences of human behavioural mimicry. *Annual Review of Psychology, 64*, 285-308. doi: 10.1146/annurev-psych-113011-143754

Chen, F.F., & Kenrick, D.T. (2002). Repulsion or attraction? Group membership and assumed attitude similarity. *Journal of Personality and Social Psychology, 83*, 111-125. doi: 10.1037///0022-3514.83.1.111

Chung, D., Christopoulos, G.I., King-Casas, B., Ball, S.B., & Chiu, P.H. (2015). Social signals of safety and risk confer utility and have asymmetric effects on observers' choices. *Nature Neuroscience, 18*, 912-916. doi: 10.1038/nn.4022

Cialdini, R.B., & Goldstein, N.J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology, 55*, 591-621, doi: 10.2246/annurev.psych.55.090902.142015

Costa-Gomes, M.A., Huck, S., Weizsäcker, G. (2014). Beliefs and actions in the trust game: Creating instrumental variables to estimate the causal effect. *Games and Economic Behaviour, 88*, 298-309. doi: 10.1016/j.geb.2014.10.006

DeBruine, L.M. (2002). Facial resemblance enhances trust. *Proceedings of the Royal Society of London B: Biological Sciences, 269*, 1307-1312. doi:10.1098/rpsb.2002.2034

DeBruine, L.M. (2005). Trustworthy but not lust-worthy: Context-specific effects of facial resemblance. *Proceedings of the Royal Society of London B: Biological Sciences, 272*, 919-922. doi: 10.1098/rspb.2004.3003

Delaherche, E., Chetouani, M., Mahdhaoui, A., Saint-Georges, C., Viaux, S., & Cohen, D. (2012). Interpersonal synchrony: A survey of evaluation methods across disciplines. *IEEE Transactions on Affective Computing, 3*, 349-365. doi: 10.1109/T-AFFC.2012.12

Diehl, M. (1990). The minimal group paradigm: Theoretical explanations and empirical findings. *European Review of Social Psychology, 1*, 263-292. doi: 10.1080/14792779108401864

Duersch, P., Oeschssler, J., & Schipper, B.C. (2014). When is tit-for-tat unbeatable? *International Journal of Game Theory, 43*, 25-36. doi: 10.1007/s00182-013-0370-1

Duffy, K.A., & Chartrand, T.L. (2015). Mimicry: causes and consequences. *Current Opinion in Behavioural Sciences, 3*, 112-116. doi: 10.1016/j.cobehav.2015.03.002

E-Prime (Version 2) [Computer Software]. Pittsburgh, PA: Psychology Software Tools, Inc.

Farmer, H., McKay, R., Tsakiris, M. (2014). Trust in me: Trustworthy others are seen as more physically similar to the self. *Psychological Science, 25*, 290-292, doi: 10.1177/0956797613494852

Fischer, I. (2009). Friend or foe: Subjective expected relative similarity as a determinant of cooperation. *Journal of Experimental Psychology: General, 138*, 341-350.doi: 10.1037/a0016073

Fischer, I., Frid, A., Goerg, S.J., Levin, S.A., Rubenstein, D.I., & Selten, R. (2013). Fusing enacted and expected mimicry generates a winning strategy that promotes the evolution of cooperation. *Proceedings of the National Academy of Sciences of the United States of America, 110*, 10229-10233. doi: 10.1073/pnas.1308221110

Gigerenzer, G., & Gaissmaier, W. (2011). Heuristic decision making. *Annual Review of Psychology, 62*, 451-482. doi: 10.1146/annurev-psych-120709-145346

Glaeser, E.L., Laibson, D.I., Scheinkman, J.A., & Soutter, C.L. (2000). Measuring trust. *The Quarterly Journal of Economics, 115*, 811-846. doi: 10.1162/003355300554926

Glimcher, P.W., & Rustichini, A. (2004). Neuroeconomics: The consilience of brain and decision. *Science, 306*, 447-452. doi: 10.1126/science.1102566

Goette, L., Huffman, D., & Meier, S. (2006). The impact of group membership on cooperation and norm enforcement: Evidence using random assignment to real social groups. *Working Paper Series, Federal Reserve Bank of Boston,* No. 06-7. Retrieved from https://www.econstor.eu

Gordon, R.M. (1992). The simulation theory: Objections and misconceptions. *Mind and Language, 7*, 11-34. doi: 10.1111/j.1468-0017.1992.tb00295.x

Gosling, S.D., Rentfrow, P.J., & Swann, W.B., Jr. (2003). A very brief measure of the big-five personality domains. *Journal of Research in Personality, 37*, 504-528. doi: 10.1016/S0092-6566(033)00046-1

Greenwald, A.G., & Pettigrew, T.F. (2014). With malice toward none and charity for some: Ingroup favoritisms enables discrimination. *American Psychologist, 69*, 669-684. doi: 10.1037/a0036056

Griffin, A.S., & West, S.A. (2003). Kin discrimination and the benefits of helping in cooperatively breeding vertebrates. *Science, 302*, 634-636. doi: 10.1126/science.1089402

Heerey, E.A. (2015). Decoding the dyad: Challenges in the study of individual differences in social behaviour. *Current Directions in Psychological Science, 24*, 285-291. doi: 10.1177/0963721415570731

Heerey, E.A., & Clerke, A. (2017). The influence of similarity and social reciprocity on decisions to trust. Retrieved from osf.io/dv7np

Heerey, E.A., & Crossley, H.M. (2013). Predictive and reactive mechanisms in smile reciprocity. *Psychological Science, 24*, 1446-1455, doi: 10.1177/0956797612472203

Heerey, E.A., & Kring, A.M. (2007). Interpersonal consequences of social anxiety. *Journal of Abnormal Psychology, 116*, 125-134. doi: 10.1037/0021-843X.116.125

Jenkins, A.C., Macrae, C.N., & Mitchell, J.P. (2008). Repetition suppression of ventromedial prefrontal activity during judgement of self and others. *Proceedings of the National Academy of Sciences of the United States of America, 105*, 4507-4512. doi: 10.1073/pnas.0708785105

Kanazawa, S., & Fontaine, L. (2013). Intelligent people defect more in a one-shot prisoner's dilemma game. *Journal of Neuroscience, Psychology, and Economics, 6,* 201-213. doi: 10.1037/npe0000010

Kandasamy, N., Hardy, B., Page, L., Schaffner, M., Graggaber, J., Powlson, A.S. … & Coates, J. (2014). Cortisol shifts financial risk preferences. *Proceedings of the National Academy of Sciences of the United States of America, 111,* 3608-3613. doi: 10.1037/pnas.1317908111

King-Casas, B., Tomlin, D., Anen, C., Quartz, S.R., & Montague, P.R. (2005). Getting to know you: Reputation and trust in a two-person economic exchange. *Science, 308,* 78-83. doi: 10.1126/science.1108062

Kirschner, S., & Tomasello, M. (2012). Joint music-making promotes prosocial behaviour in 4-year old children. *Evolution and Human Behaviour, 31,* 354-364. doi: 10.1016/j.evolhumbehav.2010.04.004

Krueger, J. (1998). Enhancement bias in descriptions of self and others. *Personality and Social Psychology Bulletin, 24,* 505-516. doi: 10.1177/0146167298245006

Kosfeld, M., Heinrichs, M., Zak, P.J., Fischbacher, U., & Fehr, E. Oxytocin increases trust in humans. *Nature, 435,* 673-676. doi: 10.1038/nature03701

Krupp, D.B., Debruine, L.M., & Barclay, P. (2008). A cue of kinship promotes cooperation for the public good. *Evolution and Human Behaviour, 29,* 49-55. doi: 10.1016/j.evolhumbehav.2007.08.002

Kuhlen, A.K., & Brennan, S.E. (2013). Language in dialogue: When confederates might be hazardous to your data. *Psychonomic Bulletin & Review, 20,* 54-72. doi: 10.3758/s13423-012-0341-8

Kutas, M., & Federmeirer, K.D. (2011). Thirty years and counting: Fidning meaning in the N400 componenet of the even-related brain potential (ERP). *Anuual Review of Psychology, 62,* 621-647. doi: 10.1146/annurev.psych.093008.131123

Kutas, M., & Hillyard, S.A. (1980). Reading senseless sentences: Brain potentials reflect semantic incongruity. *Science, 207,* 203-205.

Lakin, J.L., & Chartrand, T.L. (2003). Using nonconscious behavioural mimicry to create affiliation and rapport. *Psychological Science, 14,* 334-339. doi: 10.1111/1467-9280.14481

Lakin, J.L., Chartrand, T.L., & Arkin, R.M. (2008). I am too just like you: Nonconscious mimicry as an automatic behavioural response to social exclusion. *Psychological Science, 19,* 816-822. doi: 10.1111/j.1467-9280.2008.02162x

Launay, J., Dean, R.T., & Bailes, F. (2013). Synchronization can influence trust following virtual interaction. *Experimental Psychology, 60,* 56-63. doi: 10.1027/1618-3169/a000173

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media and young adults. *Pew Internet & American Life Project, 3*. Retrieved from pewinternet.org

Lieberman, D., Tooby, J., & Cosmides, L. (2007). The architecture of human kin detection. *Nature, 445*, 727-731. doi: 10.1038/nature05510

Lui, S.S., Ngo, H., Hon, A.H.Y. (2006). Coercive strategy in interfirm cooperation: Mediating roles of interpersonal and interorganizational trust. *Journal of Business Research, 59*, 466-474. doi: 10.1016/j.jbusres.2005.09.001

Luo, S., & Zhang, Guangjian. (2009). What leads to romantic attraction: Similarity, reciprocity, security, or beauty? Evidence from a speed-dating study. *Journal of Personality, 77*, 933-964. doi: 10.1111/j.1467-6494.2009.00570.x

MacDonald, K., Schug, M., Chase, E., & Barth, E. (2013). My people, right or wrong? Minimal group membership disrupts preschoolers' selective trust. *Cognitive Development, 28*, 247-259. doi: 10.1016/j.cogdev.2012.11.001

Maddux, W.W., Mullen, W., & Galinsky, A.D. (2008). Chameleons bake bigger pies and take bigger pieces: Strategic behavioural mimicry facilitates negotiation outcomes. *Journal of Experimental Social Psychology, 44*, 461-468. doi:10.1016/j.jesp.2007.02.003

Mailath, G.J. (1998). Do people play nash equilibrium? Lessons from evolutionary game theory. *Journal of Economic Literature, 36*, 1347-1374.

Malhotra, D. (2004). Trust and reciprocity decisions: The differing perspectives of trustors and trusted parties. *Organizational Behaviour and Human Decisions Processes, 94*¸61-73. doi: 10.1016/j.obhdp.2004.03.001

Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*, 709-734. doi:10.5465/AMR.1995.9508080335

McKelvey, R.D., & Palfrey, T.R. (1992). An experimental study of the centipede game. *Econometrica, 60*, 803-836. doi: 10.2307/2951567

McPherson, M., Smith-Lovin, L., & Cook, J.M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology, 27*, 415-444. doi: 10.1146/annurev.soc.27.415

Metzger, M.J., & Flanagin, A.J. (2013). Credibility and trust of information in online environments: The use of cognitive heuristics. *Journal of Pragmatics, 59*, 210-220. doi: 10.1016/j.pragma.2013.07.012

Montoya, R.M., & Horton, R.S. (2012). The reciprocity of liking effect. In Paludi, M. (Ed.). *The Psychology of Love* (pp.39-57). Santa Barbara, CA: Praeger

Montoya, R.M., & Pittinsky, T.L. (2011). When increased group identification leads to outgroup liking and cooperation: The role of trust. *The Journal of Social Psychology, 151*, 784-806. doi: 10.1080/00224545.2010.538762

Newcomb, T.M. (1956). The prediction of interpersonal attraction. *American Psychology, 11*, 575-586. doi: 10.1037/00003-066X.44.5.775

O'Leary, D.P. (1990). Robust regression computation using iteratively reweighted least squares. *SIAM Journal on Matrix Analysis and Applications, 11*, 466-480. doi: 10.1137/0611032

Ong, D., Zaki, J., & Gruber, J. (2017). Increased cooperative behaviour across remitted bipolar I disorders and major depression: Insights utilizing a behavioural economic trust game. *Journal of Abnormal Psychology, 126*, 1-7. doi: 10.1037/abn0000239

Oullier, O., de Guzman, G.C., Jantzen, K.J., Lagarde, J., & Kelso, J.A.S. (2008). Social coordination dynamics: Measuring human bonding. *Social Neuroscience, 3*, 178-192. doi: 10.1080/17470910701563392

Park, J.H., & Schaller, M. (2005). Does attitude similarity serve as a heuristic cue for kinship? Evidence of an implicit cognitive association. *Evolution and Human Behaviour, 26*, 158-170. doi: 10.1016j.evolhumbehav.2004.08.013

Peterson, R.A. (2001). On the use of college students in social science research: Insights from a second-order meta-analysis. *Journal of Consumer Research, 28*, 450-461. doi: 10.1086/323732

Pillutla, M.M., Malhotra, D., & Keith, M.J. (2003). Attributions of trust and the calculus of reciprocity. *Journal of Experimental Social Psychology, 39*, 448-455. doi: 10.1016/S0022-1031(03)00015-5

R Core Team (2017). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/.

Rosenthal, R.W. (1981). Games of perfect information, predatory pricing and the chain-store paradox. *Journal of Economic Theory, 25*, 92-100. doi: 10.1016/0022-0531(81)990018-1

Rotter, J.B. (1967). A new scale for the measurement of interpersonal trust. *Journal of Personality, 35*, 651-665. doi: 10.1111/j.1467-6494.1967.tb0145.x

Rushton, J.P., & Bons, T.A. (2005). Mate choice and friendship in twins: Evidence for genetic similarity. *Psychological Science, 16*, 555-559. doi: 10.1111/j.0956-7976.2005.01574.x

Sanders, M., Winters, P., & Fiscella, K. (2015). Preliminary validation of a scale to measure patient perceived similarity to their navigator. *BioMed Central Research Notes, 8*: 388. doi: 10.1186/s13104-015-1341-3Schilbach, L., Wohlschalaeger, A.M., Kraemer, N.C., Newen, A., Shah, N.J., Fink, G.R., & Vogeley, K. (2006). Being with virtual others: Neural correlated of social interaction. *Neuropsychologia, 44*, 718-730. doi: 10.1016/j.neuropsychologia.2005.07.017

Seibt, B., Mühlberger, A., Liowski, K.U., & Weyers, P. (2015). Facial mimicry in its social setting. *Frontiers in Psychology, 6*, 1122. doi: 10.3389/fpsyg.2015.01122

Shore, D.M., & Heerey, E.A. (2011). The value of genuine and polite smiles. *Emotion, 11*, 169-174. doi: 10.1037/a0022601

Shore, D.M., & Heerey, E.A. (2013). Do social utility judgements influence attentional processing? *Cognition, 129*, 114-122. doi: 10.1016/j.cognition.2013.06.011

Siedlecki, K.L., Salthouse, T.A., Oishi, S., & Jeswani, S. (2014). The relationship between social support and subjective well-being across age. *Social Indicators Research, 117*, 561-576. doi: 10.1007/s11205-013-0361-4

Simons, J. *Attitude Similarity and Attraction: Trust as a Robust Mediator* (Master's thesis). Retrieved from scholarbank.nus.edu.sg

Sparks, A., Burleigh, T., Barclay, P. (2015). We can see inside: Accurate prediction of prisoner's dilemma decisions in announced games following a face-to-face interaction. *Evolution and Human Behaviour, 37*, 210-216. doi: 10.1016/j.evolhumbehav.2015.11.003

Stel, M., & Vonk, R. (2010). Mimicry in social interaction: Benefits for mimickers, mimickees, and their interaction. *British Journal of Psychology, 101*, 311-323. doi: 10.1348/000712609X465424

Taylor, S.E., & Brown, J.D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin, 103*, 193-210. doi: 10.1037/0033-2909.103.2.193

Tidwell, N.D., Eastwick, P.W., & Finkel, E.J. (2013). Perceived, not actual, similarity predicts initial attraction in a live romantic context: Evidence from the speed-dating paradigm. *Personal Relationships, 20*, 199-215. doi: 10.1111/j.1475-6811.2012.01405.x

Valdesolo, P., & DeSteno, D. (2011). Synchrony and the social tuning of compassion. *Emotion, 11*, 262-266. doi: 10.1037/a0021302

Valkenburg, P.M., Peter, J., & Schouten, A.P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *Cyberpscyhology and Behaviour, 9*, 584-590. doi: 10.1089/cpb.2006.9.584

van den Assem, M.J., van Dolder, D., & Thaler, R.H. (2011). Split or steal? Cooperative behaviour when the stakes are large. *Management Science, 58*, 2-20. doi: 10.1287/mnsc.1110.1413

Vang, M.H., & Fox, J. (2013). Race in virtual environments: Competitive versus cooperative games with black or white avatars. *Cyberpsychology, Behaviour, and Social Networking, 17*, 235-240. doi: 10.1089/cyber.2013.0289

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metaphor package. *Journal of Statistical Software, 36*, 1-48.

Von Neumann, J., & Morganstern, O. *Theory of Games and Economic Behaviour*. Princeton, N.J.: Princeton University Press, 1947

Wheeler, L., & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality and Social Psycology, 62*, 760-773. doi: 10.1037/0022-3514.62.760

Whitmore, C.B., & Dunsmore, J.C. (2014). Trust development: Testing a new model in undergraduate roommate relationships. *The Journal of Genetic Psychology:*

Research and Theory on Human Development, 175, 233-251. doi: 10.1080/00221325.2013.869533

Whittlesea, B.W.A., & Leboe, J.P. (2000). The heuristic basis of remembering and classification: Fluency, generation, and resemblance. *Journal of Experimental Psychology, 129*, 84-106. doi: 10.1037//0096-3445.129.1.84

Williams, M. (2001). In whom we trust: Group membership as an affective context for trust development. *Academy of Management Review, 26*, 377-396. doi: 10.5465/AMR.2001.4845794

Wilson, K.S., DeRue, D.S., Matta, F.K., Howe, M., & Conlon, D.E. (2016). Personality similarity in negotiations: Testing the dyadic effects of similarity in interpersonal traits and the use of emotional displays on negotiation outcomes. *Journal of Applied Psychology, 101*, 1405-1421. doi: 10.1037/ap10000132

Wiltermuth, S.S., & Heath, C. (2009). Synchrony and cooperation. *Psychological Science, 20*, 1-5. doi: 10.1111/j.1467-9280.2008.02253.x

Wood, J.V. (1996). What is social comparison and how should we study it? *Personality and Social Psychology Bulletin, 22*, 520-537. doi: 10.1177/014616729225009

Wuensch, K.L. (2016). Using SPSS to Obtain a Confidence Interval of R^2 from Regression. Retrieved from http://core.ecu.edu/psyc/wuenschk/SPSS/SPSS-Programs.htm

Yan, W-J., Wu, Q., Liang, J., Chen, Y-H., & Fu, X. (2013). How fast are the leaked facial expression: The duration of micro-expression. Journal of Nonverbal Behaviour, 37, 217-230. doi: 10.1007/s10919-013-0159-8

Youyou, W., Stillwell, D., Schwartz, H.A., Kosinski, M. (2017). Birds of a feather do flock together: Behaviour-based personality-assessment method reveals personality similarity among couples and friends. *Psychological Science, 28*, 276-284. doi: 10.1177/0956797616678187

Ziegler, C-N. & Golbeck, J. (2007). Investigating interactions of trust and interest similarity. *Decision Support Systems, 43*, 460-475. doi: 10.1016/j.dss.2006.11.003

Appendices

Appendix A: Letters of Information

Experiment 1 & 2:

Project Title: Social cues in a chat-room environment

Document Title: Letter of information

Principal Investigator: Dr. Erin Heerey, PhD (eheerey@uwo.ca)

Invitation to Participate: You are being invited to participate in a research study investigating how social cues in an online environment shape people's later behaviour. You are being invited to participate because you signed up for the study on SONA.

Why is this study being done? The purpose of this study is to understand how nonverbal social cues affect the outcomes of social interactions.

How long will you be in this study? Participation takes about 1 hour and the session will take place in the social psychology research rooms (6400 Block SSC).

What are the study procedures? If you decide to participate, we will ask you to:

- Get to know several other players over a computer network, using an instant message style program.
- Complete a short game with each of them and rate them on several characteristics.
- Answer some questionnaires that ask about aspects of your own personality.

What are the risks and harms of participating in this study? This is a low-risk study and there are no known harms to participating. The main risk to you is that you may feel uncomfortable answering some of the questions on the questionnaires. If this occurs, you may skip those items.

What are the benefits of participating in this study? Other than that you might find it interesting, there is no direct benefit to you for participating in this study. However, your participation might help us to understand how the social cues one person provides predict and influence others' behaviour.

How will participants' information be kept confidential? All information that we obtain from you is confidential. Questionnaire information and task results will be collected using a unique participant code (below), which will never be linked to your name. These data will be collected electronically and stored in password-protected, encrypted files for 5 years, per Western University guidelines. While we do our best to protect your information, there is no guarantee that we will be able to do so.

Usually it is only the research staff that will have access to the data. However, representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research. If study results are published, no information that identifies you will be included.

Can participants choose to leave the study? Participation in this study is voluntary. You are free to withdraw from the study at any time and without penalty, even after the research has concluded. You do not need to provide a reason. You may withdraw from the study by telling the experimenter or by contacting Dr. Erin Heerey (eheerey@uwo.ca) and submitting your participant code as it appears below. All data associated with your code will then be destroyed.

Are participants compensated for their time? This is a 1-hour study. If you are a Psychology 1000 student, you will receive 1.0 SONA credits for participating. If you are participating in the context of a different class, you will receive compensation based on the information provided in the course syllabus. If you have any questions about the compensation, please review your course syllabus or contact the instructor.

Although it is not an aspect of the compensation per se, the game you will play after you get to know the other players asks participants make decisions that affect how a pool of money is shared. We will pay participants a small monetary bonus based on their decisions in the game. Participants will earn between $3 and $7 depending on the outcome of their decisions.

What are the rights of participants? Your participation in this study is voluntary. You may decide not to be involved. Even if you consent to participate, you have the right to not answer individual questions or to withdraw from the study at any time. If you choose not to participate or choose to leave the study, it will have no effect on your academic standing. If new information is learned during the study that might affect your decision to stay in the study we will inform you of this. You do not waive any legal right by consenting to the study.

Whom do participants contact for questions? If you would like more information, please contact Dr. Erin Heerey via email (eheerey@uwo.ca) or phone (519) 661-2111 x 86917.

If you have any questions about your rights as a research participant or concerns about the conduct of this study, you may contact The Office of Research Ethics (519) 661-3036, email: ethics@uwo.ca.

If you decide to participate, your participant code is: _____

When the computer program starts, you will be asked to affirm (say "yes" to) the following items:

- I have read and understood the Letter of Information.
- Any questions I chose to ask have been answered to my satisfaction.
- I understand that I may withdraw from the study at any time and do not need to provide a reason for doing so.
- I understand that I am free to skip any questionnaire items that I do not wish to answer.
- I consent to participate.

Affirming these items indicates that you consent to participate.

Please keep this letter for future reference.

Experiment 3:

Project Title: Social cues in a chat-room environment 2

Document Title: Letter of information

Principal Investigator: Dr. Erin Heerey, PhD (eheerey@uwo.ca)

Invitation to Participate: You are being invited to participate in a research study investigating how social cues in an online environment shape people's later behaviour. You are being invited to participate because you signed up for the study on SONA.

Why is this study being done? The purpose of this study is to understand how nonverbal social cues affect the outcomes of social interactions.

How long will you be in this study? Participation takes about 1 hour and the session will take place in the social psychology research rooms (6400 Block SSC).

What are the study procedures? If you decide to participate, we will ask you to:

- Get to know several other players over a computer network, using an instant message style program.
- Complete a short game with each of them and rate them on several characteristics.
- Answer some questionnaires that ask about aspects of your own personality.

What are the risks and harms of participating in this study? This is a low-risk study and there are no known harms to participating. The main risk to you is that you may feel uncomfortable answering some of the questions on the questionnaires. If this occurs, you may skip those items.

What are the benefits of participating in this study? Other than that you might find it interesting, there is no direct benefit to you for participating in this study. However, your participation might help us to understand how the social cues one person provides predict and influence others' behaviour.

How will participants' information be kept confidential? All information that we obtain from you is confidential. Questionnaire information and task results will be collected using a unique participant code (below), which will never be linked to your name. These data will be collected electronically and stored in password-protected, encrypted files for 5 years, per Western University guidelines. While we do our best to protect your information, there is no guarantee that we will be able to do so.

Usually it is only the research staff that will have access to the data. However, representatives of The University of Western Ontario Non-Medical Research Ethics Board may require access to your study-related records to monitor the conduct of the research. If study results are published, no information that identifies you will be included.

Can participants choose to leave the study? Participation in this study is voluntary. You are free to withdraw from the study at any time and without penalty, even after the research has concluded. You do not need to provide a reason. You may withdraw from the study by telling the experimenter or by contacting Dr. Erin Heerey (eheerey@uwo.ca) and submitting your participant code as it appears below. All data associated with your code will then be destroyed.

Are participants compensated for their time? This is a 1-hour study. If you are a Psychology 1000 student, you will receive 1.0 SONA credits for participating. If you are participating in the context of a different class, you will receive compensation based on the information provided in the course syllabus. If you have any questions about the compensation, please review your course syllabus or contact the instructor.
What are the rights of participants? Your participation in this study is voluntary. You may decide not to be involved. Even if you consent to participate, you have the right to not answer individual questions or to withdraw from the study at any time. If you choose not to participate or choose to leave the study, it will have no effect on your academic standing. If new information is learned during the study that might affect your decision to stay in the study we will inform you of this. You do not waive any legal right by consenting to the study.

Whom do participants contact for questions? If you would like more information, please contact Dr. Erin Heerey via email (eheerey@uwo.ca) or phone (519) 661-2111 x 86917.

If you have any questions about your rights as a research participant or concerns about the conduct of this study, you may contact The Office of Research Ethics (519) 661-3036, email: ethics@uwo.ca.

If you decide to participate, your participant code is: _____

When the computer program starts, you will be asked to affirm (say "yes" to) the following items:

- I have read and understood the Letter of Information.
- Any questions I chose to ask have been answered to my satisfaction.
- I understand that I may withdraw from the study at any time and do not need to provide a reason for doing so.
- I understand that I am free to skip any questionnaire items that I do not wish to answer.
- If I consent to participate, I promise that I will participate conscientiously and to the best of my ability.
- I consent to participate.

Affirming these items indicates that you consent to participate.

Please keep this letter for future reference.

Appendix B: Consent Procedure.

Studies 1 & 2a:
When the computer program starts, you will be asked to affirm (say "yes" to) the following items:

- I have read and understood the Letter of Information.
- Any questions I chose to ask have been answered to my satisfaction.
- I understand that I may withdraw from the study at any time and do not need to provide a reason for doing so.
- I understand that I am free to skip any questionnaire items that I do not wish to answer.
- I consent to participate.

Affirming these items indicates that you consent to participate.

Studies 2b & 3:
When the computer program starts, you will be asked to affirm (say "yes" to) the following items:

- I have read and understood the Letter of Information.
- Any questions I chose to ask have been answered to my satisfaction.
- I understand that I may withdraw from the study at any time and do not need to provide a reason for doing so.
- I understand that I am free to skip any questionnaire items that I do not wish to answer.
- If I consent to participate, I promise that I will participate conscientiously and to the best of my ability.
- I consent to participate.

Affirming these items indicates that you consent to participate.

Appendix C: Getting Acquainted Questions.

1) Which type of book would you be most likely to choose for pleasure reading?
   a) Literature
   b) Romance
   c) Mystery/Crime
   d) Fantasy

2) Which colour do you prefer?
   a) Green
   b) Blue
   c) Purple
   d) Red

3) Which leisure activity do you prefer?
   a) Watch TV/Movies
   b) Read a book
   c) Workout
   d) Hang out with friends

4) Which cuisine do you prefer?
   a) Chinese
   b) Mexican
   c) Japanese
   d) Italian

5) What is your favourite sport?
   a) Hockey
   b) Basketball
   c) Football
   d) Tennis

6) Are you more of morning or an evening person?
   a) Morning
   b) Evening

7) Are you originally from Canada?
   a) Yes
   b) No

8) Do you live off campus or on campus?
   a) On
   b) Off

9) Do you like to cook?
   a) Yes

b) No

10) What continent would you most like to visit?
   a) Europe
   b) Australia
   c) Africa
   d) Asia

11) Do you prefer to go out and party or to relax at home?
   a) Relax at home
   b) Go out and party

12) What is your favourite season?
   a) Winter
   b) Spring
   c) Summer
   d) Fall

13) Would you rather read a book or watch a TV show?
   a) Read a book
   b) Watch a TV show

14) Do you prefer Macs or PCs?
   a) Macs
   b) PCs

15) What is your preferred social media site?
   a) Facebook
   b) Twitter
   c) YouTube
   d) Instagram

16) Would you most prefer a city vacation or a country vacation?
   a) City
   b) Country

17) Would you consider yourself a feminist?
   a) Yes
   b) No

18) What would you most like to be someday?
   a) Doctor
   b) Lawyer
   c) Engineer
   d) Entrepreneur

19) Would you tend to see yourself as more liberal or more conservative?
    a) Liberal
    b) Conservative

20) Do you have a religious affiliation?
    a) Yes
    b) No

Appendix D: Questionnaires

Ten-Item Personality Inventory:

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A Very Brief Measure of the Big Five Personality Domains. *Journal of Research in Personality, 37, 504-528.*

For avatar- ratings: Here are a number of personality that may or may not apply to the people you met. Please use the number keys to indicate the extent to which **you agree or disagree with each trait**. You should rate the extent to which the pair of traits applies to the person in the image below, even if you think one of the traits might apply more strongly than the other. You may use the "9" key to skip an item.

1= Disagree strongly	2= Disagree moderately	3= Disagree a little	4= Neither agree nor disagree	5= Agree a little	6= Agree moderately	7= Agree strongly

1) Extraverted, enthusiastic.
2) Critical, quarrelsome.
3) Dependable, self-disciplined.
4) Anxious, easily upset.
5) Open to new experiences, complex.
6) Reserved, quiet.
7) Sympathetic, warm.
8) Disorganized, careless.
9) Calm, emotionally stable.
10) Conventional, uncreative.

Additional items:
Experiments 1, 2, & 3:
11) Similar to me.

Experiments 2 & 3:
12) In sync with me.

Appendix E: Trust Decision Task

1) Lend your car keys to
2) Believe lied to you about something
3) Ask for a character reference for a job from
4) Give your computer password to
5) Do a group project with
6) Believe intentionally gave you bad advice for an assignment
7) Let watch your pet while you are away
8) Give a spare house key to
9) Choose for a housemate
10) Lend $20 to
11) Let hand in an assignment on your behalf
12) Get class selection advice from
13) Ask to be your designated driver
14) Ask to take notes for you if you cannot make it to class.

Curriculum Vitae

Name:	Alexa Rempel
Post-secondary Education and Degrees:	University of British Columbia Kelowna, British Columbia, Canada 2011-2015 B.A. (Hons) The University of Western Ontario London, Ontario, Canada 2015-2017 M.S.c
Honours and Awards:	Social Science and Humanities Research Council (SSHRC) Canada Graduate Scholarship-Master's 2015-2016
Related Work Experience	Teaching Assistant University of British Columbia 2014-2015 Research Assistant University of British Columbia 2013-2015 Teaching Assistant The University of Western Ontario 2016-2017