The impact of perceived similarity on tacit coordination: propensity for matching and aversion to decoupling choices

Gabriele Chierchia1,2* and Giorgio Coricelli2,3

1Department of Social Neuroscience, Max Planck Institute for Human Cognitive and Brain Science, Leipzig, Germany,
2Center for Mind/Brain Science, University of Trento, Rovereto, Italy, 3Economics Department, University of Southern California, Los Angeles, CA, USA

Homophily, or “love for similar others,” has been shown to play a fundamental role in the formation of interpersonal ties and social networks. Yet no study has investigated whether perceived similarities can affect tacit coordination. We had 68 participants attempt to maximize real monetary earnings by choosing between a safe but low paying option (that could be obtained with certainty) and a potentially higher paying but risky option, which depended on the choice of a matched counterpart. While making their choices, participants were mutually informed whether their counterparts similarly or dissimilarly identified with three person-descriptive words as themselves. We found that similarity increased the rate of risky choices only when the game required counterparts to match their choices (stag hunt games). Conversely, similarity led to decreased risk rates when they were to tacitly decouple their choices (entry games). Notably, though similarity increased coordination in the matching environment, it did not increase the decoupling game. In spite of this, similarity increased expected payoffs across both coordination environments. This could shed light on why homophily is so successful as a social attractor. Finally, similarity increased propensities for matching and aversion to decoupling choices was not observed when participants “liked” their counterparts but were dissimilar to them. We thus conclude that the impact of similarity on coordination should not be reduced to “liking” others, e.g., social preferences, but is also about predicting them.

Keywords: coordination, similarity, homophily, economic games, social preferences, social cognition

Introduction

“Any event in the history of an organism is unique. Consequently, recognition, learning, and judgment presuppose a capability to categorize stimuli and classify situations by similarity” (Quine, 1969). There is nothing more basic to thought and language than our sense of similarity in sorting out things into kinds” (Tversky and Gati, 1978).

So many of our decisions are social: their outcomes depend on the decisions of others. This can generate strategic uncertainty (Van Huyck et al., 1990) and requires agents to infer how others will act in order to decide optimally.

Consider for instance the decision of joining a strike or a rebellion. All may know that if enough people join the uprising, they will succeed, and everyone will benefit. However, rebelling in small numbers
numbers could be dangerous, for agents might hesitate to choose to do so therefore, there is the same story in the new standard and everyone's profits. In such situations, the possible outcomes would do so either: to bevel investments in the new options, or, to isolate actions are costly. Consequently, agents should attempt to match their choices.

Conversely, there are many situations in which choosing the same option is not disadvantageous, especially when resources cannot be shared. For instance, many markets are only provided revenue to a limited number of investors, because too many others would have their price variance and very low sales. Or, more mundanely, driving in a street with a limited number of vehicles. Whether to enter the freeway is roundabout, to drive through the highway, and to convince oneself that too many others will do the same and incite one's own feelings. Here, there is little traffic jam. In these situations, agents would refer to couple their choices, and that is not the case, to a free way enter the market, and you don't. In a free market, you should enter together.

In economics, the first class of situations are said to involve strategic complements, while the latter involve strategic substitutes (Tulow, 1992; Amersin, 2003). In both cases, whenever communication is impossible or inefficient (Morris and Shin, 2002; Heinemann et al., 2004), agents must instead rely on some tacit agreement on how to coordinate their choices.

Game theory is a standard approach to understanding interdependent decision problems (henceforth, games). And it is a frequent practice in economics and political science to use games to provide strategic advice to investors, firms, or organizations (Schelling, 1960; Gibbons, 1992). However, when communication is possible or likely, the outcomes of coordination problems are often not known or not achievable. For instance, Nash equilibrium is a concept of game theory that fundamentally derives its predictions by applying deduction to the incentives and options of a given situation. Indeed, too much could be the possible outcomes of an interaction, and here, too many others are called. Nash equilibrium, in which each agent's actions are in a narrow set of options, is characterized by the fact that the choice of one is inferior to the choice of another, so that stability is that minimally deviates from its current choice. The fundamental problem with coordination games is that they have multiple Nash equilibria. In standard game theory, this provides very clear criteria for equilibrium selection (202).

1 Analogously, in concrete arguments, everyone would decide.
to manipulate or like to one another, thus similarity might deter them from attempting similar goals. If one could think of the paradigmatic form of interpersonal similarity, namely, monzygototic twins with act in concert or one has been known to more frequently match their choice in cooperation dilemmas (Segall and Hersheyber, 1999). However, what would happen if they were to play a game like rock-paper-scissors? The same similarity that helped them in their first scenario might work against them in their second. Fischer (2009) elegantly illustrates this problem with an experimental involvment in playing with their own mirror image. Indeed, though it has been previously conjectured (Fischer 2009, Krueger et al. 2012), that similarity could affect coordination in opposite ways, this has not been ever empirically demonstrated.

However, and importantly, similarity does not only alter social inferences and social interactions but also in a medium to large mediated interpersonal attraction (Byrne 1971; McPherson et al. 2001; Montoya et al. 2008 for a review) through moderating social attitudes and affect. This is in line with the similarity assumption theory, which could hinge on very basic and relatively “non-inferential” mechanisms (Zajonc 1965; Mitchell et al. 2006) such as the “mere exposure” effect (see Zajonc 2001 for review), which consists in the observation that simple repeated exposure to previously neutral stimuli increases their perceived attractiveness and “mirror image.” Indeed, though it has been previously shown to manipulate or lie to one another, thus similarity might deter them from attempting similar goals. If one could think of the paradigmatic form of interpersonal similarity, namely, monzygototic twins with act in concert or one has been known to more frequently match their choice in cooperation dilemmas (Segall and Hersheyber, 1999). However, what would happen if they were to play a game like rock-paper-scissors? The same similarity that helped them in their first scenario might work against them in their second. Fischer (2009) elegantly illustrates this problem with an experimental involvment in playing with their own mirror image. Indeed, though it has been previously conjectured (Fischer 2009, Krueger et al. 2012), that similarity could affect coordination in opposite ways, this has not been ever empirically demonstrated.

Indeed, many effects of similarity on interactions could be potentially explained by social reference theories, i.e., Fishbacher and Fischer (2003, 2004) or Amos and Fischer (2005). Indeed, many effects of similarity on interactions could be potentially explained by social reference theories, i.e., Fishbacher and Fischer (2003, 2004) or Amos and Fischer (2005)."
Methods

The Games
We used two types of two-player coordination games. Stag Hunt Games (SHs) and Entry Games (EGs), which have been extensively studied to examine the role of identity and experimental settings (reviewed in Camerer, 2003) in our study adapted from Heinemann et al. (2009)—we attempted to keep the superficial aspects of the two games as similar as possible, both having an order, and were as follows: in both games, two agents had to choose between the same two options: (1) potentially high paying but uncertain payoff (“UP”), always worth either $15.00 or 0 (two options could have been obtained by both players, but only 1 of them was obtained), (2) low paying but safe payoff (“SP”), worth any given amount with a probability of 15.00. Both games capture a frequent situation, namely, that low gains can be obtained safely in isolation, while high paying outcomes involve coordination and uncertainty. Indeed, in both games, SHs were chosen, whereas EGs were obtained for sure, regardless of the choice of one’s counterpart. On the other hand, the outcome of choosing the UP depended on the choice of one’s counterpart and the game that was played. In the uncertainty option, both players could only obtain 0,
Before taking part in the interactions of interest, participants provided both "liking" and "identity" ratings of a set of 100 personality traits. Subsequently, they interacted with counterparts that were either similar or dissimilar to them with respect to a selected subset of the traits. While playing the games, matched counterparts were told that they mutually viewed rating bars indicating whether they identified or did not identify with the traits. "Liking +" and "Liking -" indicate that participants liked or disliked the selected traits.

In synthesis, excluding the "trait-neutral" trials, this set-up yielded a $2 \times 2 \times 2 \times 2$ design, with factors: (1) game (SHs vs. EGs), (2) similarity (similar vs. dissimilar), (3) liking (liked vs. disliked traits), and (4) identity (high vs. low identification with traits). The instructions we used are available in the Supplementary Material. Within each of the resulting $2 \times 2 \times 2 \times 2$ cells, participants made a total of 40 decisions, given the high number of decisions, we adopted a presentation method analogous to the strategy method (Selten, 1965). In which participants viewed all 50 red options on a single page, rather than making each decision on a separate page. Each of the 40 resulting decision pages had 15 decisions/cell (with a decision on each page) presented in a randomized order.

Person-descriptive words were taken from Person related adjectives, and had been rated on the basis of their likableness. Since we aimed to orthogonalize identity and liking scores, we selected 50 moderately positive and 50 moderately negative traits. Consequently, we sorted the traits on the basis of their likableness, and took 100 words from 2 clusters: 50 from a moderately positive cluster, and 50 from a moderately negative cluster.

Lottery
To control for the potential impact of inter-individual differences in (non-strategic) risk attitudes, participants took part in a "lottery" condition, which took place after the strategic games. For the lottery task, participants were endowed with $5.00 additional dollars and were allowed to make an investment on a lottery extraction with a winning probability of 2/3. Participants could invest any amount (0 included) of their $5.00 endowment. To implement the lottery, in clear sight of all participants, we placed two red balls and one blue ball (of equal dimension) into a hole on top of an opaque box, and shook it. Participants were informed that, after placing their bets, randomly designated participants would have blindly extracted a single ball from the box. If the ball was red, the experimenters would have doubled participants’ investments, while if the ball was blue, the investment would have been lost. We took the amount invested by each participant as a measure of their (non-strategic) risk attitudes.

Participants
The experiment was carried out at the University of Southern California. In 5 sessions, 68 participants took part in the 2 coordination tasks implemented in z-Tree (Fischbacher, 2007).
Procedures
Participants interacted in groups of four individually shielded computer cubicles. After being assigned to the experimental condition (via a computerised random assignment), instructions were read aloud and followed by a short questionnaires about understanding of the games. The questionnaire could only be completed if the participant correctly responded to all of its items. This was done to ensure that the participants understood the rules of the games. All procedures were approved by the local ethical committees. Our data is available upon request.

Statistical Analysis
Data was analyzed with generalised linear mixed-effect models ("GLMMs": Bolker et al., 2009) with the ‘lmer’ and ‘glmer’ packages (Baayen et al., 2008). The environment was available in R (Venables & Smith, 2005).

Analysis of Choice
Since our principle dependent variable was the dichotomous choice "SP" or "UP" (i.e., "risk") we used GLMM with a logistic link function (as also done in Heinemann et al., 2010). Our main question of interest was whether similarity affected choices oppositely in coordination games that required the four-way interaction between the following fixed-effect terms: sure ("lottery"), and let this interact with the game factor. In synthesis, investments participants had made in the lottery condition (2009) have shown that (non-strategic) risk attitudes (i.e., as established by lotteries with known probabilities) are related to similarity. Consequently, our model included the following fixed-eﬀect terms: payoﬀs, identity (liking), similarity and SPs. The specific value of the SP was attributed to the speciﬁc choice of the respective player. Since in both games, one player chose the SP, thus was determined by whether the one’s counterpart had chosen the SP (i.e., chose the non-risk option). However, in the conditional situation, had chosen the UP (i.e., the risk option) the player’s payoff was determined by the expected value of "EV" + the posterior probability of being matched with someone who also had chosen the UP in the same condition. For instance, suppose that in a given trial participant had chosen the risk option and that the player had chosen the risk option as well. Then had the trial been in the dissimilarity condition, the payoff was computed as 0.7 * 15.00 [i.e., EV = 0.7 * 15 + 0 (15.00)] (and respectively in the analogous situation in the dissimilarity condition this did not seem justified. For instance, when coordinating with a dissimilarity payoff. As just described.

Analysis of Expected Payoﬀs
As noted above our participants were only allegedly paid for one randomly determined trial. However, a study of the potential economic impact of similarity across condition and participants showed that expected payoﬀs (correctly responding to all of its items. This was done to ensure that the participants understood the rules of the games. All procedures were approved by the local ethical committees. Our data is available upon request.)

Analysis of Coordination Rates
We defined "successful coordination" as the probability of either "matching choices" or "not having chosen the same option" as the other participant. Correspondingly, our model included the four-way interaction between the following fixed-effect terms: sure ("lottery") and let this interact with the game factor. In synthesis, investments participants had made in the lottery condition (2009) have shown that (non-strategic) risk attitudes (i.e., as established by lotteries with known probabilities) are related to similarity. Consequently, our model included the following fixed-eﬀect terms: payoﬀs, identity (liking), similarity and SPs. The specific value of the SP was attributed to the speciﬁc choice of the respective player. Since in both games, one player chose the SP, thus was determined by whether the one’s counterpart had chosen the SP (i.e., chose the non-risk option). However, in the conditional situation, had chosen the UP (i.e., the risk option) the player’s payoff was determined by the expected value of "EV" + the posterior probability of being matched with someone who also had chosen the UP in the same condition. For instance, suppose that in a given trial participant had chosen the risk option and that the player had chosen the risk option as well. Then had the trial been in the dissimilarity condition, the payoff was computed as 0.7 * 15.00 [i.e., EV = 0.7 * 15 + 0 (15.00)] (and respectively in the analogous situation in the dissimilarity condition this did not seem justified. For instance, when coordinating with a dissimilarity payoff. As just described.

Analysis of Expected Payoﬀs
As noted above our participants were only allegedly paid for one randomly determined trial. However, a study of the potential economic impact of similarity across condition and participants showed that expected payoﬀs (correctly responding to all of its items. This was done to ensure that the participants understood the rules of the games. All procedures were approved by the local ethical committees. Our data is available upon request.)
participant made given the actual choices of all the others. We investigated how this was affected by similarity.

**Results**

**Similarity Manipulation Validation**

As was to be expected, we observed a positive correlation between identity and liking ratings of the 100 adjectives (r = 0.57, p < 0.001) (Figure 2, blue), suggesting that subjects usually identified with traits they liked and disliked traits they didn’t identify with. In spite of this, all four groups of adjectives retrieved by our algorithm couldn’t be differentiated (Figure 2, black circles). The average identity ratings within triplets were significantly higher for the ID+ group than the ID- group (p < 0.001) and liking ratings were higher in the ID+ group than the ID- group (p < 0.001). For the trait triplets meant to have coherent identification and liking scores (namely, ID+ and ID-Like-), ratings between the two dimensions (identity and liking) were not differentiable (both p > 0.08). While for incoherent triplets, in which identity and liking were pitted one against the other, the two scores strongly associated in the anticipated direction (both p < 0.001).

However, given the mentioned correlation, the liking and identity scores also slightly changed when passing from the coherent clusters (ID+ and ID-Like-) to the incoherent ones (ID-Like+ and ID+ Like-). For instance, liked adjectives that subjects didn’t identify with (ID-Like+) were certainly liked more than disliked adjectives from either of the two “low-liking” clusters (both p < 0.001). However, they weren’t liked as much as those that subjects also identified with. To partially alleviate this residual multicollinearity of liking and identity, we checked whether the results obtained in our statistical model held when using the centered identity and liking scores (rather than the corresponding “high vs. low”) as factors.

**Behavior in Games**

A logistic generalized mixed effects model was fit to the data and no observations were excluded from the analysis. The model revealed a significant four-way interaction between the factors game, similarity, identity, and liking (X² = 5.466, p < 0.05) (see Table 1 in Supplementary Material). This suggests that similarity had a differential impact on choices depending on its characteristics and on whether choices had to be matched or decoupled. The direction of this interaction constituted a bias against anticipated when traits were both liked and identified (ID+ Like+) and similarity significantly increased the probability of “risky” choices in SHs (p < 0.001) but decreased in EGs (p < 0.05) (Figure 3).

![FIGURE 2 | Identity and liking ratings of 100 personality traits by 68 participants (on a 1–7 Likert scale). Darker colors indicate the frequency of observations, which are not clearly discernible in the diagonal (indicating that subjects usually identify with the traits they like and dislike traits they don’t identify with).](image)

11 Mean difference in liking (ID-Like+ - ID-Like-) = 3.7, p < 0.001; mean difference in liking (ID-Like+ - ID-Like-) = 4.4, p < 0.001.

12 Mean difference in identity (ID+ Like- - ID- Like+) = 1, p < 0.001

13 Log-likelihood difference (gam-dissim) = 0.546, c = 0.12.

14 Log-likelihood difference (gam-dissim) = 0.22, c = 0.11.
The impact of perceived similarity on tacit coordination games requiring players to either match their choices ("strategic complements" – "Stag hunt" games) or decouple them ("strategic substitutes" – "Entry" games) without communicating. Curves represent estimated probabilities of choosing a potentially higher paying but uncertain payoff vs. a safely paying but certain alternative. Stars indicate significant effects of similarity on the estimated probability of choosing a risky choice with p < 0.05, ** with p < 0.001.

Expected Payoff
Importantly, similarity not only affected choices, but also affected expected payoffs as well. Indeed, especially when personality traits were identified with similar counterparts, participants in the similarity condition were indeed more likely to choose their choice than those in the dissimilarity condition (p < 0.001), especially when choosing the risky option. However, similarity did not increase coordination in the decoupling environment, that is, similar counterparts were not "better" at decoupling their choices than dissimilar counterparts (p = 0.23). More specifically, we found that this was due to the fact that restricting the comparison of "coordination rates" to "safe choices" only, participants in the similarity condition were nearly worse at decoupling their choices than those in the dissimilarity condition (p = 0.07) so that this "they should have been entered more frequently on the flipside if this were restricting the same comparison to risky choices." Participants in the similarity condition 21

Probability of Successful Coordination

Focusing on the condition in which we observed a significant effect of similarity on choices (the "ID+Like+" condition) we found that, in the matching environment, participants in the similarity condition were indeed more likely to match their choices than those in the dissimilarity condition (p < 0.001). In contrast, similarity did not increase coordination in the decoupling environment that is, similar counterparts were not "better" at decoupling their choices than dissimilar counterparts (p = 0.23). More specifically, we found that this was due to the fact that restricting the comparison of "coordination rates" to "safe choices" only, participants in the similarity condition were nearly worse at decoupling their choices than those in the dissimilarity condition (p = 0.07) so that this "they should have been entered more frequently on the flipside if this were restricting the same comparison to risky choices" participants in the similarity condition 21

Figure 3 | The impact of similarity on coordination games requiring players to either match their choices ("strategic complements" – "Stag hunt" games) or decouple them ("strategic substitutes" – "Entry" games) without communicating. Curves represent estimated probabilities of choosing a potentially higher paying but uncertain payoff vs. a safely paying but certain alternative. Stars indicate significant effects of similarity on the estimated probability of choosing a risky choice with p < 0.05, ** with p < 0.001.

19SH (sim−dissim): 0.05 ± 0.11, e = 0.44, EG (sim−dissim): −0.13 ± 0.11, p = 0.22.
20SH (sim−dissim): −0.17 ± 0.11, e = 0.13, EG (sim−dissim): −0.01 ± 0.11, p = 0.91.
21 Interaction between similarity, liking and identity (p < 0.05) and determining coordination rates.
Covariates: Game, Sure Payoff, and Risk Attitudes

As expected, our model estimated that the likelihood of making a risky decision was roughly 2% lower when choices had to be decoupled (TIGs) rather than when they had to be matched (SHs) (p < 0.001), suggesting a relative propensity for matching choices, rather than for decoupling them, regardless of similarity. In spite of this, uncertainty in SHs was far from absent. Indeed, while participants readily chose the uncertain option when the alternative saw payoffs were low, they gradually eased off as the two saw payoffs increased (log odds of slope 0.51, s.e. 0.01). Specifically, participants appeared indifferent between the two options when their payoffs were roughly 50% of what they would have earned by choosing the uncertain option together (average indifference point: $9.98). Correspondingly, increasing SP values linearly decreased expected payoffs per well (p < 0.001). Finally, risk attitudes were established from the subjects’ willingness to accept the lottery condition did not explain some of the variance. Indeed, the more participants invested in the lotteries, the more likely they were to choose the uncertain option in the SHs only (game × risk interaction p < 0.001). However, the reported effects of similarity were netted of the effect of all of these covariates.

Discussion

Across a wide range of experimental designs, similarity/dissimilarity was usually based on self-reported identification with three trait-related words, and hence could be biased by the subjects’ selection of self-reflective statements. One way to make the decision process more reliable is to use the standard paradigm of the stag hunt game, which relies on the ratio between payoffs magnitudes of the “cooperate” or “defect” outcomes. The fact that the stag hunt, a coordination game with strategic complementarities, is not just a major theoretical problem for game theory (Camerer, 2003), but also a strong pragmatic one, led to the development of methods for investigating the influence of similarity on coordination in experimental settings (e.g., typical win–win situations, stag hunts). The problem is that while subjects fear that their counterparts might not do the same, they also think that their counterparts fear the same about them (i.e., a 2nd order belief), which can generate what Hofstadter calls “reverberating doubt” (Hofstadter, 1985). In line with this, even non-social similarity (or “content free similarity”) has been shown to impact social inferences and behavior in games (Mussweiler and Ockenfels, 2013). It thus appears that subjects can pick up on similarity-related cues rather easily and that they do coordinate on the higher paying option, even when they know that their counterparts are not sure about it.

Similarity and “Complementarity”: Propensity for Matching Choices

Coordination games with strategic complementarities are not just a major theoretical problem for game theory (Camerer, 2003), but also a strong pragmatic one. The problem is that even in situations where there is an economic synergy among players (i.e., typical win–win situations, stag hunts), coordination still remains elusive (Cooper et al., 1990). Indeed, especially when the “risk involved is high” (Harsanyi and Selten, 1988)—that is, when the “risk” involved is high—players would refer to coordinated higher paying option (24) they fear that their counterparts might not do the same (25). The results suggest that perceived interpersonal similarity could only provide a basis for assurance (26). Players can decouple coordinated more efficiently if they choose the optimal option in non-harmful counterparts on the one hand, and more likely than not, on the other hand.

Notably in our experimental design, similarity/dissimilarity was only based on self-reported identification with three trait-related words, and hence could be biased by the subjects’ selection of self-reflective statements. One way to make the decision process more reliable is to use the standard paradigm of the stag hunt game, which relies on the ratio between payoffs magnitudes of the “cooperate” or “defect” outcomes. The fact that the stag hunt, a coordination game with strategic complementarities, is not just a major theoretical problem for game theory (Camerer, 2003), but also a strong pragmatic one, led to the development of methods for investigating the influence of similarity on coordination in experimental settings (e.g., typical win–win situations, stag hunts). The problem is that while subjects fear that their counterparts might not do the same, they also think that their counterparts fear the same about them (i.e., a 2nd order belief), which can generate what Hofstadter calls “reverberating doubt” (Hofstadter, 1985). In line with this, even non-social similarity (or “content free similarity”) has been shown to impact social inferences and behavior in games (Mussweiler and Ockenfels, 2013). It thus appears that subjects can pick up on similarity-related cues rather easily and that they do coordinate on the higher paying option, even when they know that their counterparts are not sure about it.
Similarity and Substitutability: Aversion to Decoupling Choices

Our hypothesis that similarity would provide assurance in stag hunts games was based on the following paraphrase of inference 28: wishful hopping to the primal option and the counterparty is likely to do the same as well. However, one can critically think: while such an inference would indeed generate assurance in stag hunts, it could even increase uncertainty in games involving strategic substitutes, such as entry games. Indeed, in such games, if both participants choose their own optimal outcomes, they both obtain a nothing gain. Our finding is even with this. We hypothesized similar players took more risk than dissimilar players in stag hunts, positive for true entry games, similar counterparts took less risk than similar ones.

Even though the direct comparison has seldom been made in the literature, previous studies have suggested that games with strategic substitutes elicited higher uncertainty than games with strategic compliments (Charness et al., 2006; Chen and Li, 2009). For instance, Camerer and Karjalainen (1994) found that players exhibited a higher tolerance to uncertainty whenever they could be matched with their choice, i.e., because their payoff was more anti-correlated. While Oxer and Weber (2002) observed a relative propensity for uncertainty when player choice was coordinate in a way involving correlated payoffs (i.e., could be correlated with the option that the other player did not enter). Huns and entry games differ in amounts of required cooperation, a requirement for recursive thinking and recursive thinking (Nagle et al., 1999). In line with this, we found that regards similarity of players, partially choose the uncertain option less frequently in entry games than stag hunts (see Figure 6) and that they choose more veness when they play entry games with similar counterparts.

A second important difference between stag hunts and entry games is that the standard deviation of the mixed strategy equilibrium ("MS") works poorly for the stag hunts but surprisingly well for entry games (Camerer and Fehr, 2006). For example, entry games with a PE = 1 risk-neutral players are in MSE. Only 3% of hours enter entering i.e. choosing the UP. Indeed, in such situations, player belief that 3% of non-player enters entering stag such that one player enters hating the other with probability = 0.93. This expected earning of for entering stag would be qualitatively higher than the probability of being matched to someone who did not enter that is £10.00. Naturally, this reasoning would seem futile because players have little information on which to base their probability estimates in one-shot entry games. However, in this case, the player would enter. Yet, without communication, it is likely that players would not enter. Naturally, this reasoning would seem futile because players have little information on which to base their probability estimates in one-shot entry games. However, with communication, it is likely that players would not enter.

Naturally, we would expect a high payoffs advantage in entry games as well, given that players' choice across participants is found to be MSE-based probability of the Nash equilibrium. To this we make one addition: since MSE outcomes are actual rather than expected, the probability of being matched with a counterpart is significantly higher in MSE compared to a Nash equilibrium. Consequently, the probability of being matched with a counterpart is significantly higher in MSE compared to a Nash equilibrium. Notably, this occurred in the context of our fact study.
that similarity did not increase participants' general ability to decouple their choices (while they did favor matching in the matching environment). Specifically, we found that similarity might have indirectly increased expected payoffs of interacting environments (more non-risky outcomes increased uncertainty; i.e., lowered entry rates). Rather than as a result of increased decoupling abilities.

At any rate, our findings show how similarity can potentially increase expected payoffs of interactions over those with opposite poles of coordination: matching and decoupling. This could shed light on why homophily is a successful social attractor.

The Impact of Similarity on Coordination: Not Just Social Preferences

As illustrated by Cooper et al. (1990), “a weakness of the Nash equilibrium concept is that it does not generate unique equilibrium. Nash’s case must be augmented by an assumption refining the beliefs of players about the strategies selected by their opponents [cursive ours].” Although we have created perceived similarities, the key difference from other studies is that beliefs or inferences of players about coordination environments did not lead players to believe that they are more likely to make similar choices. This should increase uncertainty when choices are made (entry or stag hunts).

However, his interpretation faces a potentially important confound. Indeed, as illustrated in our introduction of this paper, similarity has primarily been considered to increase interpersonal attraction (Byrne, 1971; McPherson et al., 2001) and others’ preferences (Van Lange, 1999; Robins and Fischbacher, 2003). Could this principle explain our findings without invoking inferences? For example, if a participant does not believe they are more likely to make similar choices, this should increase uncertainty when choices are made (entry or stag hunts).

Here, we demonstrated that agents were willing to incur higher financial risks when they are more coordinated with their choices. However, we find that this effect is specific to the coordination environment. The finding that similarity breeds attraction has been called one of the most robust relationships in all of behavioral sciences (Berger, 1973). In spite of this, we suggest that perceived interpersonal similarity and decoupling used as a coordination device can both decrease and increase strategic uncertainty depending on the incentives at play. Furthermore, we find that when similarity is removed from the interaction, coordination is much decreased. In the presence of this, our findings show that perceived interpersonal similarities can increase the collected expected payoffs. Agents might be more likely to deviate from their choices and “like” each other’s actions more, which can increase their behavioral patterns and thus effective coordination.

Conclusion

According to Quine (1969), “There is nothing more basic to thought and language than our sense of similarity.” And psychologists have long insisted that similarity is a critical factor in decision making (Meltzoff, 2007). Similarity could provide the fundamental window on how minds work together (Ames, 2004; Robbins and Krueger, 2005; Goldman, 2006; Krueger et al., 2012).

Indeed, our finding that similarity breeds attraction has been called one of the most robust relationships in all of behavioral sciences (Berger, 1973). In spite of this, we suggest that perceived interpersonal similarity and decoupling used as a coordination device can both decrease and increase strategic uncertainty depending on the incentives at play. Furthermore, we find that when similarity is removed from the interaction, coordination is much decreased. In the presence of this, our findings show that perceived interpersonal similarities can increase the collected expected payoffs. Agents might be more likely to deviate from their choices and “like” each other’s actions more, which can increase their behavioral patterns and thus effective coordination.

Acknowledgments

We thank Isabelle Crocas, Juan Carrillo, Alessandro Rustichini for their insightful comments, Anna Anabelle, Dalton Combs, Elsa Fouragnan, Tommaso Urcolo, Mateus Offily, Luca Polonio, Mariachiaria Rummolino, and especially Silvia Caruso for their invaluable support. The study was funded by the European Research Council (ERC Consolidator Grant 617629) and the Italian Ministry of Education, University, and Research (grant to GC).

Supplementary Material

The Supplementary Material for this article can be found online at http://journal.frontiersin.org/article/10.3389/fnbeh.2015.00202.

34 Putting differently, an individual’s beliefs are based on simply what he has seen or he has been told but not on the maximally beneficial strategies his counterpart could adopt. This option is also uncertain and might be related to the information and inferences about the environment, as we do not observe the respective choices of their opponents. However, our counterpart would never choose a condition.

35 Though see Sloman and Rips (1998) or Gilboa and Schmeidler (1995) for more recent reviews of similarity.
