Imagine-self perspective-taking and Nash behavior

Ramsza, Michal and Karbowski, Adam

SGH Warsaw School of Economics, SGH Warsaw School of Economics

2016

Imagine-self perspective-taking and Nash behavior

This is a preliminary version (from early 2016) of the further paper "Karbowski A and Ramsza M (2017) Imagine-Self Perspective-Taking and Rational Self-Interested Behavior in a Simple Experimental Normal-Form Game. Front. Psychol. 8:1557. doi: 10.3389/fpsyg.2017.01557". The latter publication was supported by National Science Centre, Poland (grant number UMO-2016/21/B/HS4/03016).

Michał Ramsza* Adam Karbowski †

Abstract

We hypothesize that introduction of imagine-self perspective-taking by decision-makers promotes Nash choices in a simple experimental normal-form game. In particular, we examined behavior of 404 undergraduate students in the experimental game, in which row player can suffer a monetary loss only if (1) she plays her Nash equilibrium pure strategy and (2) the other player plays her dominated pure strategy. Results suggest that the threat of suffering monetary losses effectively discourages the row players from choosing Nash equilibrium strategy. The row players can rationally take the possibility of playing dominated strategy by column players into account. The column players can play dominated strategy either because of their not full rationality or their specific not self-interested motivation. However, adopting imagine-self perspective by the row players seems to effectively shorten the psychological distance between them and the column players, alleviate attributing (by row players) (i) a susceptibility to errors (ii) and/or some non-self-interested motivations to the column players and in effect promote Nash equilibrium choices in the proposed experimental game. The imagine-self-self-interest link is further postulated and succinctly discussed in the context of relevant psychological and economic literature.

Keywords: empathy, imagine-self perspective, rational behavior, self-interested behavior, experimental games

1 Introduction

Weizsäcker (2003) coined the hypothesis that decision-makers' tendency to ignore their opponents' incentives in experimental normal-form games is an artefact of the experimental environments in the laboratories, and in particular of the use of abstract payoff matrix presentations in experimental procedures. Weizsäcker (2003) further suggests that adding a context to the experiments (and probably developing a more realistic sense of strategic

* Department of Mathematics and Mathematical Economics, Warsaw School of Economics, Al. Niepodległości 162, 02-554 Warsaw, Poland. Email: mramsz@sgh.waw.pl.
† Department of Economics, Warsaw School of Economics, Al. Niepodległości 162, 02-554 Warsaw, Poland. Email: adam.karbowski@sgh.waw.pl.

choice) would help the subjects to perceive their opponents' decision problems more vividly and clearer. From the viewpoint of game-theoretic models of quantal response (see e.g. McKelvey and Palfrey, 1995) the subjects' tendency to ignore their opponents' incentives can be referred to as an anomaly (Weizsäcker, 2003). In these models it is usually assumed that players are aware of the level of randomness in their opponents' motivations (Weizsäcker, 2003). However, the game play data seem to consistently reject the above-mentioned assumption (cf. Weizsäcker, 2003).

The following article addresses the outlined behavioral "anomaly" of ignoring rationality of others in experimental normal-form games. In particular, we set out to investigate whether the subjects' tendency to ignore their opponents' incentives in a simple experimental normal-form game can be alleviated due to introduction of imagine-self perspective-taking by decision-makers. To this end, we examined subjects' behavior in a simple experimental normal-form game (for details, see section 2), in which one of the two players (row player) can suffer a monetary loss only if (1) she plays her Nash equilibrium (pure) strategy and (2) the other player (column player) plays her dominated (pure) strategy.

We hypothesize that introduction of imagine-self perspective-taking by decision-makers promotes Nash choices in the outlined game. In particular, we expect that adopting imagine-self perspective by the row player shortens the psychological distance (Liberman et al., 2007) between her and the column player[1]. In consequence, the column player may appear to her more similar (similarity is one of the forms of psychological distance, see Liviatan et al., 2006). If so, "psychologically closer" individual may seem to decision-maker more likely to be rational, which is how decision-makers tend to perceive themselves (see e.g. Rawls, 1971; O'Neill, 1998; Hendrikse, 2003; Hollis, 2013). As a result, row player's confidence that the opponent will play her dominant strategy may rise and so the number of Nash choices made by row players in our experiment.

In his seminal work on psychological perspectives on another's situation, Stotland (1969) distinguished two different forms of perspective taking, i.e. (1) imagine-self and (2) imagine-other. Imagine-self perspective means imagining what one's own thoughts and emotions would be if one were in the situation of the other person (Batson, 2014). According to Grohn and others (2014) imagine-self mindset is related to the often documented (see Marks and Miller, 1987) false-consensus bias (false-consensus effect) where experimental subjects tend to believe that others are similar to them. Imagine-other perspective translates in turn to

[1] For more studies on psychological distance and behavior in experimental games, see e.g. Aguiar et al., 2008; Kim et al., 2013. More on the topic can be also found in discussion section.

imagining the thoughts and emotions of the other person (Batson, 2014). Stotland (1969) found that both above-mentioned forms of imagining lead to increased emotional arousal in comparison to adopting emotionally cool, objective perspective (Batson, 2014). Batson and others (1997) report that imagine-self perspective-taking produces both self-oriented and other-oriented (empathic) emotions in decision-makers. Imagine-other perspective-taking seems in turn to produce solely other-oriented empathic concern (Batson, 2014).

As Grohn, Huck and Valasek (2014) notice, the concept of empathy despite its importance in Humean (1739) and Smithian[2] (1759) philosophical enunciations has never gained a decent foothold in economic theory. Grohn and others (2014) showed that empathy should be perceived as a distinct psychological mechanism that affects both belief and utility formation in strategic decision-making. In the presence of empathy, beliefs and utility become intricately linked, even minor manipulations of beliefs may change player's utility. Grohn and others (2014) suggest that empathy, among other functions, is a cognitive tool that allows to produce inferences about the other's beliefs in a strategic context, and so to predict another player's choice.

Psychological research (Batson, 2011) indicates strong links between imagine-other perspective-taking and altruistic behavior, links that are not present when decision-makers adopt imagine-self perspective (Grohn et al., 2014). The following study shows in fact that the imagine-self perspective-taking may be linked to Nash equilibrium behavior of decision-makers. Batson (2011) suggests that imagining others triggers helping behavior of individuals due to (i) pure need to help others, (ii) need to reduce personal tension over suffering of others, (iii) fear of social sanctions or (iv) drive for social rewards. As Grohn and others (2014) note, Batson (2011) demonstrates how helping behavior remains a stable phenomenon even if channels ii, iii and iv are shut down, supporting the empathy-altruism hypothesis.

According to Batson (2011) the key route to trigger altruistic behavior in humans is to adopt imagine-other perspective. Since empathic emotions are induced by both imagine-other and imagine-self perspective-taking, the empathy-altruism hypothesis refers in fact to imagine-other-altruism hypothesis. Then, since Nash equilibrium concept is believed to model self-interested behavior of decision-makers involved (Cohen, 1998), and the following study links imagine-self perspective-taking to Nash equilibrium behavior, the imagine-self-self-

[2] Both imagine-self and imagine-other perspective-taking refer to high-level cognitive processes described by Adam Smith as mindreading (1759). Mindreading is today defined as people's ability to infer what others think or feel (Batson, 2009; Grohn et al., 2014). Smith stressed that these high-level processes are deliberate, what stands in contrast to Hume's (1739) conception of empathy understood as automatic assessing of others (thus close to interpersonal mimicry, see e.g. Lakin et al., 2003; Iacoboni, 2009).

interest hypothesis could be considered. In consequence, it is not excluded that empathy-behavior link extensively discussed in philosophical and psychological literature (cf. Maibom, 2014) can be decomposed not only into (1) imagine-other-altruism hypothesis (see e.g. Batson, 2011), but also, at least under some specific circumstances, into (2) imagine-self-self-interest hypothesis.

The implications of empathy-altruism hypothesis (in fact, imagine-other-altruism hypothesis) for strategic choice have been rigorously investigated by Grohn and others (2014). These authors explored the possibility that decision-makers who are more sophisticated when it comes to evaluating the preferences of others are also more prone to have other-regarding preferences. Grohn and others (2014) hypothesized that decision-makers who adopt imagine-other perspective have more accurate beliefs than purely selfish players. On the basis of three toy games (a public good game, an ultimatum game and a battle of the sexes game) the authors showed that decision-makers with other-regarding preferences have more accurate beliefs of other players' types (a low-empathy (L) or a high-empathy (H) type)[3], and are therefore "better" strategic players. From the viewpoint of our paper, the most interesting is the analysis of battle of the sexes game play data and, in particular, the fact that the expected coordination between types L and H is higher than between two H types (Grohn et al., 2014). The authors explain this rather counterintuitive result by the use of imagine-self perspective by type L. Imagine-self perspective-taking works as a credible commitment device to play type L's preferred option at a higher-than-equilibrium rate, causing a player of type H to yield and play her less-preferred option (Grohn et al., 2014). It seems consistent with our experimental results, where adoption of imagine-self perspective by the row player increases probability of playing Nash equilibrium strategy by her.

The remainder of the paper proceeds as follows. We describe participants, materials and experimental procedure in section 2. The results presented and analyzed in section 3 are then briefly discussed in the light of relevant psychological and economic theories in the final section 4.

2 Method

To test expectations elaborated upon in the previous section an experiment was designed and conducted. The experimental procedure comprised a single two-player normal-form

[3] More game-theoretic analyses on players' beliefs of other players' types can be found e.g. in Stahl and Wilson (1994; 1995) and Huck and Weizsäcker (2002).

game. The game was presented to four experimental groups of subjects numbering about one hundred subjects each (for details, see the next section). Each group, prior to solving the game, was given different instructions (the set of instructions given to subjects is presented further in this section).

Participants

Participants of the experiment were 404 undergraduate students of Warsaw School of Economics (SGH). In particular first year and second year students participated in the experiment. During first year of studies at Warsaw School of Economics students do not choose any particular profile of studies (in order to complete a bachelor's degree students major in one of the taught disciplines, ranging from business and economics studies, through decision sciences and information systems to political science and international relations).

Materials and experimental procedure

During the experiment the following two-player normal-form game was used.

Table 1. The normal-form game used in the experiment.

	L	R
T	600; 600	-300; 500
B	500; 600	300; 500

Source: own material.

Because participants did not have any prior knowledge about games, a short (about 10 minutes) tutorial on how a game is played was given at the beginning of the procedure. It was then checked that the participants understood a concept of a strategy and payoff. The subjects were told to think of numbers in table 1 as if they were monetary amounts in euros[4] that the participants can gain (positive payoffs) or lose (negative payoffs) depending on the decisions taken in the game.

After the tutorial participants were given randomly chosen versions of printed instructions (one of four versions, see table 2) with the normal-form game. The solving of the game by participants was not time-limited, and on average it took a participant about 3 minutes to indicate her/his choice. The printed instructions were next collected and the results were computed in a spreadsheet application.

[4] These are significant monetary values for the SGH undergraduate students. E.g. 500 euros cover average monthly living expenses of the SGH undergraduate students.

Note that the above game (see table 1) is solvable through the process of iterative elimination of the strictly dominated strategies. It is easy to see that the R (right-hand) strategy of a column player is strictly dominated by the L (left-hand) strategy. Once the R strategy is eliminated the B (bottom) strategy of a row player becomes strictly dominated. As a result there is a single strict pure strategy Nash equilibrium (T[5], L).

There were four experimental groups numbering about one hundred participants each. Each group was given different instructions. These instructions are provided below.

Table 2. Experimental instructions.

Group number	Instructions given
1	You are a row player (you choose between T and B). Indicate your choice by underlining one of the following strategies: T or B.
2	You are a column player (you choose between L and R). Indicate your choice by underlining one of the following strategies: L or R.
3	You are a row player (you choose between T and B). Before you make your choice, what would be your choice if you were a column player: L or R (indicate your choice be underlining). Now make choice for yourself: T or B (indicate by underlining).
4	You are a column player (you choose between L and R). Before you make your choice, what would be your choice if you were a row player: T or B (indicate your choice by underlining). Now make choice for yourself: L or R (indicate by underlining).

Source: own material.

The above instructions are constructed in such a way as to test how behavior of a given player, either row or column, varies as the player is guided to consider choices of an opponent. As with imagine-self perspective-taking people try to imagine themselves in other people's shoes, instructions given to groups 3 and 4 are intended to induce imagine-self perspectives in subjects belonging to those groups.

3 Results

[5] T stands for top.

The results of the experiment are given in table 3. Observe that for the first two (compare table 2) experimental groups only one strategy is to be selected (one choice is to be made), but for the last two experimental groups two strategies make up an answer (two choices are to be made by participants) and so there are four possibilities.

Table 3. Received results.

Strategy chosen	Number of participants that chose the given strategy	Relative frequency of the given choice
Group 1		
T	39	0.371
B	66	0.629
Group 2		
L	94	0.904
R	10	0.096
Group 3		
TL[6]	56	0.583
TR	1	0.010
BL	33	0.344
BR	6	0.063
Group 4		
TL	36	0.364
TR	3	0.030
BL	58	0.586
BR	2	0.020

Source: own material.

Some of the results seem fairly clear. In the first experimental group only about 37 per cent of subjects chose strategy T and about 63 per cent went with a choice of strategy B. This result seems not even close to the unique strict pure strategy Nash equilibrium of the presented game. There is, however, no surprise (from the viewpoint of sufficiently rational and self-interested subjects) in results within the second group. Almost all (over 90 per cent)

[6] The two-letters notation indicates participants' choices made in the third and fourth experimental groups.

participants of the second group chose the dominant strategy L. Only 10 out of 104 subjects chose the dominated strategy R. In the third experimental group over 90 per cent of subjects chose the optimal (Nash equilibrium) strategy for a column player (strategy L) and at the same time about 59 per cent of subjects chose the Nash equilibrium strategy T. This share is visibly higher than in the first experimental group (about 59 per cent in the third group to about 37 per cent in the first one). In the fourth experimental group about 95 per cent of subjects chose the optimal strategy of a column player (in comparison to about 90 per cent in the second group, respectively). Within the fourth experimental group about 39 per cent of subjects chose the Nash equilibrium strategy of a row player (in comparison to 37 per cent in the first group, respectively).

In this study we decided to formulate the following research hypotheses.

Hypothesis 1

In the first experimental group a proportion of subjects choosing a strategy B is higher than a proportion of subjects choosing a strategy T.

Hypothesis 2

A proportion of subjects choosing T in the third experimental group is higher than a proportion of subjects choosing B in the third experimental group.

Hypothesis 3

A proportion of subjects choosing T in the third experimental group is higher than a proportion of subjects choosing T in the first experimental group.

Hypothesis 4

A proportion of subjects choosing L in the third experimental group is higher than a proportion of subjects choosing R in the third experimental group.

Hypothesis 5

A proportion of subjects choosing TL in the third experimental group is higher than a proportion of subjects choosing BL in the third experimental group.

Hypothesis 6

A proportion of subjects choosing L in the second experimental group is higher than a proportion of subjects choosing R in the second experimental group.

Hypothesis 7

A proportion of subjects choosing strategy L in the fourth experimental group is higher than a proportion of subjects choosing R in the fourth experimental group.

Hypothesis 8

A proportion of subjects choosing L in the fourth experimental group is equal to a proportion of subjects choosing L in the second experimental group.

Hypothesis 9

A proportion of subjects choosing L in the second experimental group is higher than a proportion of subjects choosing T in the first experimental group.

Observe that in our simple experimental normal-form game the row player can suffer a monetary loss only if (1) she plays her Nash equilibrium (pure) strategy T and (2) the other player plays her dominated (pure) strategy R. We believe that the threat of suffering monetary losses can effectively discourage the row players from choosing strategy T in the first experimental group. The row players can rationally take the possibility of playing strategy R by column players into account. The column players can play strategy R either because of their not full rationality (and so the column players may e.g. do not understand the decision problem completely or make mistakes in solving it or indicating their choices) or their specific not self-interested motivation. However, in the third experimental group adopting imagine-self perspective by the row players may effectively shorten the psychological distance between them and the column players, alleviate attributing (by row players) (i) a susceptibility to errors (ii) and/or some non-self-interested motivations to the column players and in effect promote Nash equilibrium choices made by the row decision-makers. The above reasoning stands behind hypotheses 1, 2, 3, 4 and 5.

Since in our study the column players are not faced with the threat of suffering monetary losses, the adopting imagine-self perspective by the column decision-makers should not change much in their choices. L should be a desirable strategy no matter how the row player is perceived. This reasoning stands behind hypotheses 6, 7, 8 and 9.

For testing about a single proportion an exact test of the statistical significance of deviations from a theoretically expected distribution of observations into two categories was used (binomial test), and for testing about two proportions a permutation (randomization) test was used. The *p*-values reported in table 4 refer to null hypotheses given in footnotes while decisions refer to research hypotheses.

The results of the tests are given in the following table.

Table 4. Test results.

Hypothesis number	P-value	Hypothesis
1	0.005409[7]	not rejected
2	0.0411[8]	not rejected
3	0.001263221[9]	not rejected
4	2.2e-16[10]	not rejected
5	0.009593[11]	not rejected
6	2.2e-16[12]	not rejected
7	2.2e-16[13]	not rejected
8	0.2854253[14]	not rejected
9	1.506029e-16[15]	not rejected

Source: own material.

4 Discussion

We believe that at least two causes may stand behind the observed behavior of row players in the first experimental group (the majority of the row players in the first experimental condition select strategy B). As already mentioned, the row players may choose non-Nash equilibrium strategy because of rational expectations that (i) the column player is not fully

[7] Null hypothesis: probability of choosing strategy T is 0.5. Alternative hypothesis: probability of choosing strategy T is smaller than 0.5.
[8] Null hypothesis: probability of choosing strategy T is 0.5. Alternative hypothesis: probability of choosing strategy T is greater than 0.5.
[9] Null hypothesis: probability of choosing T in the third group is equal to probability of choosing T in the first group. Alternative hypothesis: probability of choosing T in the third group is higher than probability of choosing T in the first group.
[10] Null hypothesis: probability of choosing L is 0.5. Alternative hypothesis: probability of choosing L is greater than 0.5.
[11] Null hypothesis: probability of choosing TL is 0.5. Alternative hypothesis: probability of choosing TL is greater than 0.5.
[12] Null hypothesis: probability of choosing L is 0.5. Alternative hypothesis: probability of choosing L is greater than 0.5.
[13] Null hypothesis: probability of choosing L is 0.5. Alternative hypothesis: probability of choosing L is greater than 0.5.
[14] Null hypothesis: probability of choosing L in the fourth group is equal to probability of choosing L in the second group. Alternative hypothesis: probability of choosing L in the fourth group is not equal to probability of choosing L in the second group.
[15] Null hypothesis: probability of choosing L in the second group is equal to probability of choosing T in the first group. Alternative hypothesis: probability of choosing L in the second group is higher than probability of choosing T in the first group.

rational or (ii) is motivated to act in a not self-interested manner. The latter can be at least partially explained by social value orientation (SVO) theory (McClintock, 1972; Griesinger and Livingston, 1973). The row player may know that the column player can exhibit competitive orientation and so seek for a maximization of her relative gain. Note that selecting strategy R by the column player may mean in fact sacrificing risk-free 100 euros to inflict losses on the row player. The self-interested column decision-maker should instead select strategy L in order to maximize her individual gain.

The row player may also take the possibility of mistake made by the (even self-interested) column player into account. In neoclassical economics full rationality means that the ratio of decision maker's cognitive capacities to problem complexity always equals 1 (Hendrikse, 2003). Consequently, a decision maker is able to immediately solve any problem and makes no mistakes. Since this form of rationality is postulative in nature and not realistic (see e.g. Selten, 1999), the row players may convincingly take the possibility of errors made by column players into account. The column players may at least (i) do not understand the decision problem properly, (ii) make mistakes in solving the problem or (iii) make mistakes in indicating the desired answer. Simply put, the row players may attribute (even not fully consciously) some other form of rationality (other than full rationality) to column players, i.e. for example bounded (limited) rationality or procedural rationality (cf. Hendrikse, 2003). Bounded rationality occurs when the ratio of decision maker's cognitive capacities to problem complexity is lower than 1 (Simon, 1961). Procedural rationality occurs when the ratio of decision maker's cognitive capacities to problem complexity is nearly zero (Hendrikse, 2003). Other than full rationality concepts of rationality allow the possibility of errors made by the decision-maker.

When we look at the results, we can conclude that in our experimental game the pure strategy Nash equilibrium concept does not work well. Note that in game equipped with instructions that do not induce imagine-self perspective, the majority of outcomes would be (B, L) instead of the single strict pure strategy Nash equilibrium (T, L). The pure strategy Nash equilibrium concept works better when assisted with the experimental instructions intended to induce imagine-self perspective. In game equipped with such an instruction the majority of outcomes would be (T, L).

It seems that somehow the imagine-self perspective-taking promotes Nash choices in our simple experimental normal-form game. What is the reason for that? How this statistically significant difference in results (see e.g. hypotheses 1, 2 and 3) can be explained? One possible explanation can be found on the grounds of psychological distance theory. This

explanation, though appealing, is not exhaustive and at this stage should be treated as a conjecture. We think that adopting imagine-self perspective by the row player shortens the psychological distance between her and the column player. An object is more psychologically distant as it takes place farther into the future, as it occurs in more remote locations, as it is less likely to occur, and as it happens to people less and less like oneself (Trope et al., 2007). Cognitive psychologists assume that people mentally construe objects that are psychologically not distant in terms of low-level, detailed, and contextualized qualities, whereas at a distance they construe the same objects in terms of high-level, abstract, and stable characteristics (Trope et al., 2007). Experimental instructions intended to induce imagine-self perspective may encourage row players to think about column players not as abstract decision-makers, but real people, probably similar to participants at least in some terms. In consequence, the column player may appear to the participant "psychologically closer". If so, "psychologically closer" individual may seem to participant more likely to be rational, which is how decision-makers tend to perceive themselves. As a result, row player's confidence that the opponent will play her dominant strategy may rise and so the number of Nash choices made by row players in our experiment.

Note that the third (and the fourth) experimental condition could be in fact also perceived as a game with oneself, i.e. the decision-maker may "impose herself" (e.g. her own preferences) on the other player. Then the column player in the third experimental condition may appear to the decision-maker really "psychologically close" and definitely more predictable comparing to the first condition. Observe further that (i) a proportion of subjects choosing L in the third experimental group is higher than a proportion of subjects choosing R in the third experimental group (hypothesis 4) and (ii) a proportion of subjects choosing TL in the third experimental group is higher than a proportion of subjects choosing BL in the third experimental group (hypothesis 5). If experimental subjects from the third group see themselves in the column players and tend to select strategies L and T in the third experimental condition, it seems reasonable to suppose that subjects from the third group acted in a self-interested and sufficiently rational manner.

It is also worth noticing that imagine-self perspective taking by participants allows to receive significantly more game results that would be generated in a society consisting of (i) sufficiently rational and (ii) self-interested people (pairs of choices – TL). Perhaps then imagine-self perspective-taking can act as a specific cognitive device promoting self-interested behavior of society members in strategic interactions, in the best interest of the

whole society. Imagine-self perspective taking may be then close to this form of Smithian mindreading (1759) that assists working of the "invisible hand".

Having briefly discussed in the previous paragraph the imagine-self-self-interest link, it remains to comment on the results corresponding to the last four hypotheses. As expected, the adopting imagine-self perspective by the column decision-makers does not change much in their choices. L remains a desirable strategy no matter how the row player is perceived.

References

Aguiar, F., Branas-Garza, P., & Millar, L.M. (2008). Moral distance in dictator games. *Judgment and Decision Making, 3*, 344-354.

Batson, C.D., Early, S., & Salvarini, G. (1997). Perspective taking: imagining how another feels versus imagining how you would feel. *Personality and Social Psychology Bulletin, 23*, 751–758.

Batson, C.D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), The social neuroscience of empathy. Cambridge: MIT Press.

Batson, C.D. (2011). Altruism in Humans. Oxford: Oxford University Press.

Batson, C.D. (2014). Empathy-Induced Altruism and Morality: No Necessary Connection. In H.L. Maibom (Ed.), Empathy and Morality. Oxford: Oxford University Press.

Cohen, J. (1998). Cooperation and self-interest: Pareto-inefficiency of Nash equilibria in finite random games. *Proceedings of the National Academy of Sciences of the United States of America, 95*, 9724-9731.

Griesinger, D.W., & Livingston, J.W. (1973). Toward a model of interpersonal motivation in experimental games. *Behavioral Science*, 18, 173-188.

Grohn, J., Huck, S., & Valasek, J.M. (2014). A note on empathy in games. *Journal of Economic Behavior & Organization, 108*, 383-388.

Hendrikse, G. (2003). *Economics and Management of Organizations: Co-ordination, Motivation and Strategy*. New York: McGraw-Hill.

Hollis, N. (2013). *Brand Premium: How Smart Brands Make Money*. New York: Palgrave Macmillan.

Huck, S., & Weizsäcker, G. (2002). Do players correctly estimate what others do? Evidence of conservatism in beliefs. *Journal of Economic Behavior and Organization, 47*, 71-85.

Hume, D. (1739). A Treatise of Human Nature. Oxford: Oxford University Press.

Iacoboni, M. (2009). Imitation, empathy, and mirror neurons. *Annual Review of Psychology*, *60*, 653-670.

Kim, H., Schnall, S., Yi, D., & White, M.P. (2013). Social distance decreases responders' sensitivity to fairness in the Ultimatum Game. *Judgment and Decision Making, 8,* 632-638.

Lakin, J.L., Jefferis, V.E., Cheng, C.M., & Chartrand, T.L. (2003). The chameleon effect as social glue: Evidence for the evolutionary significance of nonconscious mimicry. *Journal of Nonverbal Behavior*, *27*, 145-162.

Liberman, N., Trope, Y., & Stephan, E. (2007). Psychological distance. In A.W. Kruglanski & E.T. Higgins (Eds.), Social Psychology: Handbook of Basic Principles. New York: Guilford Press.

Liviatan, I., Trope, Y., & Liberman, N. (2006). Interpersonal similarity as a social distance dimension: A construal level approach to the mental representations and judgments of similar and dissimilar others' actions. Unpublished manuscript, New York University.

Maibom, H.L. (2014). Empathy and Morality. Oxford: Oxford University Press.

Marks, G., & Miller, N. (1987). Ten years of research on the FCE: An empirical and theoretical review. *Psychological Bulletin, 102*, 72-90.

McClintock, C.G. (1972). Social motivation – A set of propositions. *Behavioral Science*, 17, 438-454.

McKelvey, R.D., & Palfrey, T.R. (1995). Quantal response equilibria for normal form games. *Games and Economic Behavior, 10*, 6-38.

O'Neill, J. (1998). Self-love, Self-interest and the Rational Economic Agent. *Analyse & Kritik, 20*, 184-204.

Rawls, J. (1971). A Theory of Justice. Cambridge: Harvard University Press.

Selten, R. (1999). What is Bounded Rationality?. SFB Discussion Paper B-454.

Simon, H. (1961). Administrative Behavior. New York: Free Press.

Smith, A. (1759). The Theory of Moral Sentiments. Edinburgh: Millar.

Stahl, D.O., & Wilson, P.W. (1994). Experimental evidence on players' models of other players. *Journal of Economic Behavior and Organization, 25*, 309-327.

Stahl, D.O., & Wilson, P.W. (1995). On players' models of other players: theory and experimental evidence. *Games and Economic Behavior, 10*, 218-254.

Stotland, E. (1969). Exploratory investigations of empathy. In L. Berkowitz (Ed.), Advances in experimental social psychology (Vol. 4, pp. 271–313). New York: Academic Press.

Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal Levels and Psychological Distance: Effects on Representation, Prediction, Evaluation, and Behavior. *Journal of Consumer Psychology, 17*, 83-95.

Weizsäcker, G. (2003). Ignoring the rationality of others: evidence from experimental normal

form games. *Games and Economic Behavior, 44*, 145-171.