Original Papers

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The effect of metacognitive self on confirmation bias revealed in relation to community and competence

Abstract: The main goal of our study was to investigate the role of insight into one's own biases (metacognitive self) in the process of hypothesis validation in accordance to the two fundamental social perception domains (community and competence) on the example of confirmation bias. The study was conducted on a group of 593 participants with the use of a confirmation bias procedure, a free recall procedure and the Metacognitive Self scale. We manipulated with the domain and the value of information given to the respondents. We suspected that individuals with a high metacognitive self, in opposition to low metacognitive self ones, would not process the given information according to the two fundamental social perception domains. The results verified the existence of an interaction effect of the metacognitive self (MCS) and the domain of the information given about a perceived person on the susceptibility to follow the confirmation bias. Contrary to the low metacognitive self individuals, who show a higher tendency for the confirmation bias within the competence than the community domain, persons with a high insight into their own biases express the same level of confirmation bias in no respect to the domain of the information. The value of the information has no significant influence.
Key words: metacognitive self, social perception, community, competence, cognitive biases, confirmation bias.

Metacognitive self (MCS) and social perception

Judging others exists as a common phenomena and works as default option in social perception. The process of judgment is often anchored in the content of data about other people. According to the Dual Perspective Model of Agency and Communion (DPM) there exist two fundamental dimensions of content in social cognition which are community (morality, warmth) and competence (agency) (Wojciszke, 1994, 2005, Fiske et al., 1999; Abele, Wojciszke, 2007, Wojciszke, Abele, Baryla, 2009). Community refers to an individual's relation and actions toward others as a member of a social group, while competence focuses on the human beings' own goals and pursuits.

At the same time social cognition and social behavior usually involve two possible perspectives – of an actor who performs an action or of an observer (recipient) of the action. The perspectives can change quickly within social interactions as people take turns and may at one time be actors and at another time observers of a particular situation. While observing and interpreting the behavior of others' from the observer's perspective people usually notice a wide range of biases and irrationalities. On the other hand, when reflecting on one's own behavior only a few individuals follow the same pattern – most of them become unable to recognize and admit their own irrational, biased ways of thinking (Brycz, Gulgowska, 1999). This type of thinking is now called in the literature as a blind spot bias (Pronin, Lin, Ross, 2002). Cognitive biases as deviations from rational thinking in everyday situations are in fact a certain statistical generalization. It is known, however, that most people manifest that tendency. Yet when a group large enough is asked to assess whether the given tendencies are or aren't expressed in their behaviours, one can expect to find individuals characterized by higher and lower accuracy of perceiving themselves in reference to the complex self-knowledge. The higher accuracy is probably related with the earlier conscious perception and the understanding of one's behaviours, with seeking sensible reasons for these behaviours and with building a kind of meta knowledge concerning the manifested biases (the effect of the process described requires earlier reinterpretation and self-awareness, Gazzaniga, 2011). To

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know how each psychological bias demonstrated in the literature is displayed in one's behaviour, is the criterion of perceiving oneself accurately. It is the knowledge about one's knowledge on the subject of biases in one's own behaviour. We call it metacognitive self (MCS, Brycz, 2012). The literature dedicated to the development and the influence of self-knowledge on our thoughts and feelings, although rich (Markus, 1980, Jarymowicz, 2008, Swann, 1984, Sedikides et al., 2003, Wojciszke, 2011, Dweck, 2000, Sarafino, 2011, Lerner, Clayton, 2011, Baumeister, Vohs, 2004, Trzebińska, 1998), lacks the consideration of metacognitive self viewed as gaining the accurate insight into one's own biases and psychological regularities. The specific insight into one's own behaviour plays an exceptional role. However this conscious and accurate insight into biases manifested in one's own behaviour is uncommon (Brycz, 2004) and can be a means of evoking a distance towards oneself, and consequently – a greater ability to self-regulate (Baumeister, 2000).

Our investigation was the *confirmation bias* (Heider, 1958). It arises as a result of a bias of a special importance for the human tendency to maintain compliance between existing knowledge and incoming data. Individuals biased towards their own hypothesis do not consider other hypothesis properly and disregard facts that may disprove their ideas. The mechanism of the confirmation bias ensures rejection of inconvenient hypothesis held to be true. This type of bias is very common, and is not restricted only to lay – perceiver. It is also manifested in science itself (e.g. Epstein, 2004). In our investigations it served as the dependent variable.

According to common knowledge people process negative information and information of a communal content using more piecemeal strategies than in case of positive or agentic type data (Reeder, Brewer, 1979) . Therefore we suspect that the participants of our study will show a higher level of confirmation bias while analyzing positive or agentic information about other people than in case of negative or communal data. On this basis we expect the main effect of the valence and the domain of information on the tendency to follow the confirmation bias.

A high level of metacognitive self as an insight into one's own biases and irrationalities is a sign of being able to look at oneself from a different, more detached perspective – as if the observer's point of view. In our study we wanted to verify the influence of the level of metacognitive self on the individual's social perception as far as forming impressions about others in concerned. We suspect that metacognitive self may change the typical impact of competence and community dimensions on human judgmental process. As individuals with a high metacognitive self recognize their own biases and irrationalities (untypical for the actor's perspective), we assume that they may go beyond the basic perspectives and dimensions in forming impressions not only about themselves, but also about others. Therefore we suppose that they will use a confirmatory strategy to the same extent no matter the domain of the information (competence vs community).

At the same time we assume that low metacognitive self individuals, who are characterized with a low insight into their biases (typical for the actor's perspective), adopt the receiver's point of view while formulating social judgments about others and focus on the communal aspects of their behavior. What follows, they may use a confirmatory strategy less often for the community domain and more often for the competence domain – they shall analyze the more important communal content more carefully and systematically, while processing the less significant agentic information in a more nonsystematic, heuristical manner.

Assumptions

Hypotheses

H1a. Impact of value of information on confirmation bias is predicted: a higher level of confirmation bias will occur for positive than negative pieces of information.

H1b. Impact of type of information on confirmation bias is predicted: a higher level of confirmation bias will occur within competence domain than within community domain.

H2. MCS x type of information interaction is predicted: individuals with a high level of metacognitive self will show an equal tendency to use a confirmatory strategy in both the competence and the community domains, while individuals with a low level of metacognitive self will follow the confirmation bias more often in the competence than in the community domain.

Method

Subjects. The respondents were 593 undergraduate students: 311 females, 282 males whose age ranged from 18 to 30 ($M = 24,5$, SD=2.19). Students were recruited randomly among all Gdansk University faculties and they were recruited also at University for Social Science and

Humanities in Sopot

Procedure. All subjects were given a polls package, which consisted of a confirmation bias procedure according to each type of schema – community: positive schema (honesty) and negative schema (dishonesty) versus competence: positive schema (intelligent), and negative schema (unintelligent) - between group independent variables (accommodation of Bar-Tal procedure, Bar-Tal, 1994), a Metacognitive Self questionnaire – within group independent variable (Brycz, Karsiewicz, 2011, α – Cronbach in current study = 0,81) and a Free Recall questionnaire that measured all recalled words exposed earlier while presenting given type of schema – between group independent variable (Bar-Tal, 2010). Questionnaires were given in fixed random order as well as the type of schema was assigned randomly to each person.

An adopted Bar – Tal's measure of confirmation bias was applied to community and competence. Communal: either negative (dishonest) or positive (honest) as well as the agentic traits – positive (intelligent) or negative (unintelligent) were presented to subjects in cover stories. Each person got acquainted only with one type of schema

(e.g. only dishonesty). In the first part of the study the respondents were given the following instruction: You want to judge a person "A" in terms of e.g. dishonesty - which pieces of information, and to what extent on a scale from 1 (not at all) to 6 (the most) are crucial for you to be sure whether a person "in question" is e.g. dishonest. According to the instruction participants were asked to decide to what extent the 15 presented below behaviors made them certain whether a person to be judged is either honest (or dishonest); or intelligent (or unintelligent) depending on the version of the study (4 groups). We created 15 sentences per 4 possible versions of the study. Each time five sentences were consistent with the schema (e.g. honest: "she/he gives the money back", intelligent "she/he passes exam and got grade A"), five were inconsistent (honest "she/he steels money") and five were irrelevant (e.g. "she/he often reads newspaper"). That was the moment of schema activation creating a possibility to verify whether people prefer schema consistent over schema inconsistent pieces of information (reliabilities for community , α – Cronbach in our study = 0,85, for competence, α – Cronbach in current study = 0,90).

We manipulated with:

- the domain of the information – community vs. competence
- the value of information – positive vs. negative

In the second part the subjects were asked to fulfil the Metacognitive Self Scale. The Metacognitive Self scale consists of 40 statements. Respondents take an attitude towards each statement on a continuous scale, ranging from 0% "this does not describe me at all" to 100% "it describes me completely" (the scales should be 10 cm in length). The MCS scale used in studies to date is characterized by acceptable reliability (α – Cronbach in our study = 0,81).

Below we give examples of the items from the currently used version of the Scale:

6. I tend to judge other people positively rather than negatively. (positivity bias - the participants were not provided with this information)

0%---100%

20. TV commercials really influence my choices and I buy advertised products more often (mere-exposure effect).

0%---100%

15. If something or someone from the outside forces me to change my behaviour, my views concerning this behaviour also change (forced conformity).

0%---100%

Next, in order to obtain the delayed free recall procedure a short distraction period was interpolated by asking the participants to also fulfil some additional irrelevant questionnaires. In the last part of the study their task was to undergo the free recall procedure. They were asked to recall as many pieces of information from the first part of the study as possible and were given the instruction not to look back to former parts of the study (Bar-Tal, 1994).

Special confirmation bias indexes were constructed. The higher the index the more confirmation bias was observed. The first one was created on the basis of the value the participants ascribed to the sentences presented in the beginning of the study.

CB index 1 = value assigned to the five schema consistent pieces of information - (minus) value assigned to the five schema inconsistent (diagnostic) pieces of information.

The second index was constructed on the basis of the delayed free recall procedure. The number of recalled words that were consistent with the given schema (confirming the trait of the person presented in the instruction e.g. honesty) and recalled words inconsistent with the schema (diagnostic, disconfirming this trait) identical with the ones exposed in the first part of the study was calculated in each participant's answers and subtracted from each other. The more consistent with the schema words the higher confirmation bias.

CB index 2 = the number of schema consistent words – (minus) the number of schema inconsistent words.

Independent variable manipulation:

As independent variables served:

- The type of schema (community: honesty vs. competence: intelligence) – between groups variable.
- The value of schema (positive: honest, intelligent vs. negative: dishonest, unintelligent) – between groups variable.
- The Metacognitive Self raw score – sum of 40 items for each person. This is within group continuous variable.

The dependent variable. As the dependent variable served the level of confirmation bias measured by the confirmation bias indexes described above.

Results

A linear regression was conducted within a model: explanatory (independent) between groups variables: MCS (continuous variable) x type x value on both indexes of confirmation bias (explained variables, within subject). Model appeared valid for type, value and metacognitive self, adjusted $R^2 = 0.07$.

H1a. The main effect of value appeared significant for both indexes of confirmation bias.

CB index 1: $\beta = 0,173$, $t = 4,311$, $p < 0,001$.
CB index 2: $\beta = 0,158$, $t = 3,962$, $p < 0,001$

Figure 1. Main effect of value on both indexes of confirmation bias
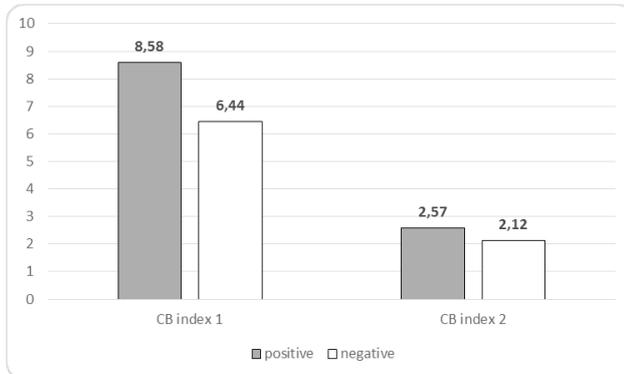
CB index 1:
negative $M = 6,44$ vs. positive $M = 8,58$, $t (590) = - 4,12$, $p < 0,001$
CB index 2:
negative $M = 2,12$ vs. positive $M = 2,57$ $t (590) = - 3,73$, $p < 0,001$

According to the results individuals commit the confirmation bias more often in case of positive than negative information what is consistent with the well-known negativity effect - the tendency of most people to assign more weight to negative than positive information in descriptions of others. The effect of valence is one of the most commonly observed in social judgments. People are guided by the value of all data and pay attention to what certifies good or bad nature of a perceived person (Reeder, Brewer, 1979).

H1b. The main effect of type appeared significant for both indexes of confirmation bias.

CB index 1: $\beta = -0,143$, $t = - 3, 575$, $p < 0,001$.
CB index 2: $\beta = - 0,159$, $t = -3,991$, $p < 0,001$.

Figure 2. Main effect of type (domain) on both indexes of confirmation bias
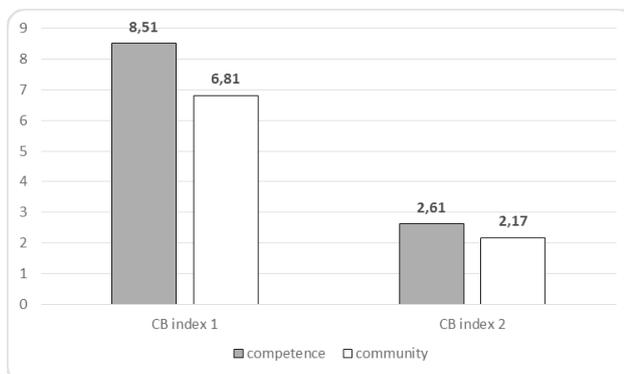
CB index 1 competence
$M = 8,51$ vs. community $M = 6,81$, $t (590) = 3,21$, $p < 0,002$
CB index 2: competence
$M = 2,61$ vs. community $M = 2,17$,$t (591) = 3,59$, $p < 0,001$

The results are consistent with the assumptions of the Dual Perspective Model of Agency and Communion. They show that the confirmatory strategy is used more often in case of agentic than communal pieces of information. People weigh community more than competence what is typical of the competence - community asymmetry. Therefore they use more analytical strategies while processing community data and more heuristic strategies such as the confirmation bias while processing competence data. Yet what is of most importance, further results of our study indicate that metacognitive self may change this pattern.

H2. The type x value as well as the MCS x type x value interactions appeared insignificant, yet an expected interaction effect between MCS x type occurred significant for both indexes of confirmation bias.

CB index 1: $\beta = - 0,116$, $t = - 2,853$, $p < 0.004$
CB index 2: $\beta = - 0.13$, $t = - 3,207$, $p < 0.002$

Figure 3. Interaction type x MCS on both indexes of confirmation bias
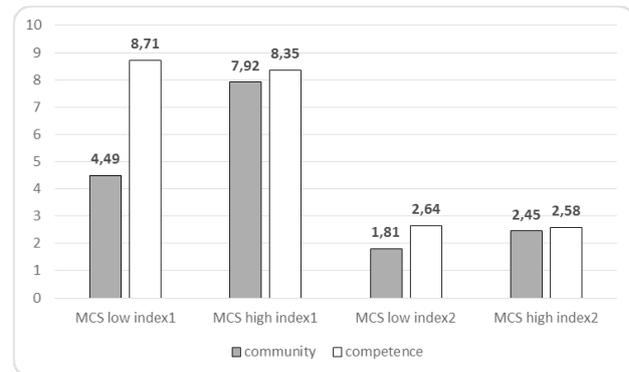
CB index 1:
Low MCS: competence $M = 8.711$ vs. community $M = 5.371$, $t (271) = 4.493$, $p < 0.001$
High MCS: competence $M = 8.350$ vs. community $M = 7.915$, $t (310) = 0.585$, n.s.
CB index 2:
Low MCS competence $M = 2.637$ vs. community $M = 1.809$ $t (272) = 4.852$, $p < 0.001$
High MCS competence $M = 2.582$ vs. community $M = 2.449$, $t (310) = 0.784$, n.s.

Individuals with a low metacognitive self use a confirmatory strategy more often in the competence domain than in the community domain. At the same time, high metacognitive self individuals express the same higher level of confirmation bias in no respect to the information domain. It means that people who possess high knowledge about their own biases do not process information about social world according to its domain (community vs. competence).
As high MCS are at the same time biased and accurate in self- perception (CB index 1: $\beta = 0,155$, $t = 3,875$, $p < 0,001$, Low MCS $M = 6,76$ vs. High MCS $M = 8,10$, $t (583) = -2,53$, $p < 0,02$; CB index 2: $\beta = 0,168$, $t = 4,202$, $p < 0,001$, Low MSC $M = 2,15$ vs. High MCS $= 2,51$, $t (584) = - 2,91$, $p < 0.005$) they reveal a preference for general heuristic processing. Since that, they not use piecemeal processing

neither in case of perceiving competence nor community. Confirmation strategy is present in high metacognitive self individuals' minds independently of the information domain. The valence of the information does not influence this effect (the 3 way interaction: MCS x type x valence is insignificant). High MCS while observing dishonest or unintelligent behavior create a hypothesis about dishonesty or lack of intelligence of a perceived person and try to confirm it. At the same time when they watch honest or intelligent behavior of an individual they form a hypothesis on honesty or intelligence of a performer and they also try to confirm it.

Contrary to high MCS – low MCS individuals' judgments about other people differ in relation to the domain. Lower usage of heuristic way of thinking among low MCS allows to put into consideration an assumption of the well – known domain – related asymmetry effect (Reeder, Brewer, 1979). When low MCS observe either honest or dishonest behavior (community domain) they use piecemeal way of thinking. Yet when they watch either intelligent or unintelligent behavior (competence domain) they adopt heuristic processing methods. It's because morality of others is more important than their competence.

We also obtained a significant interaction MCS x value on both confirmation bias indexes:

CB Index 1: $\beta = 0.159$, $t = 3.866$, $p < 0.001$
CB Index 2: $\beta = 0.157$, $t = 3.799$, $p < 0.001$

Figure 4. Interaction value X MCS on both indexes of confirmation bias
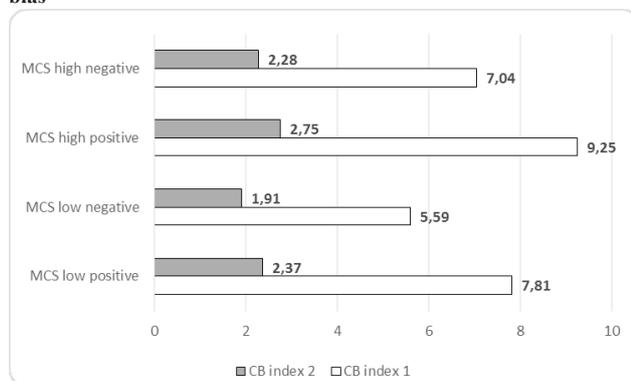
CB Index 1:
High MCS: positive $M = 9.253$ vs. negative $M = 7.037$, $t (310) = - 3.051$, $p < 0.003$, and
Low MCS: positive $M = 7.806$ vs. negative $M = 5.585$, $t (271) = - 2.96$, $p < 0.004$
CB index 2:
High MCS: positive 2.754 vs. negative $M = 2.276$, $t (310) = - 2.888$, $p < 0.005$, and
Low MCS: positive $M = 2.368$ vs. negative $M = 1.912$, $t (272) = - 2.629$, $p < 0.01$

The interaction between the metacognitive self and the value of information appeared significant, but in fact as a result of the difference in the level of confirmation bias revealed by the high and low metacognitive self individuals. The significant interaction MCS x value can be therefore treated in this case as an artifact resulting from the applied method as the value of the information about a perceived

person itself played no significant role in the interaction.

Discussion

The results of the study are in concordance with our predictions, as well as with the existing theory (Bar – Tal, 2010, Brycz, 2012, Wojciszke, 2005). According to the Dual Perspective Model of Agency and Communion while making judgments about others individuals pay more attention to the community domain than to the competence domain. The two basic dimensions are differently related to the two common perspectives in social interaction - the actor's (interpretation of own behavior) and the observer's perspective (interpretation of others' behavior). (Abele & Brack, 2013; Abele & Bruckmüller, 2013; Abele & Wojciszke, 2007; Wojciszke & Abele, 2008; Wojciszke et al., 2011). Generally people estimate the world in a manner which favors their own interests. In accordance to this tendency and to the assumptions of the DPM model while forming impressions about others (observer's perspective) the communal content is more important than the agentic one as it brings information about the person's attitude towards others and, what follows, the possible profits or dangers of entering into an interaction with this person. Therefore traits related to community, for example honesty, receive more interest in social judgments of others than those belonging to competence, like for instance intelligence. On the other hand, from the actor's perspective, in one's own behavior agentic content is of higher significance than communal for the well-being of the individual Wojciszke et al., 2011). The results of our study correspond with this trend by indicating that in general within the community domain a lower tendency to follow the confirmation bias can be observed than within the competence domain what stands for a more analytical approach towards the communal contents in social interactions - typical for processing information of a greater significance.

Yet what is of most importance, according to the results high MCS individuals create social judgments in an untypical manner – without taking into account the domain of the social information (what is characteristic for low metacognitive self individuals). The usage of the two fundamental dimensions of social perception – community and competence is closely related to adopting the agent's or the recipient's point of view. We suspect that high metacognitive self individuals, because of their insight into their own biases, which is typical for the observer's but not the actor's perspective, are simply more flexible in perceiving one selves and other people. They seem to perceive one's own behavior and the actions of others from the same perspective. Lack of the common asymmetry between perception of self versus others may be the hypothetical reason for uniformity of social judgments as far as competence and community are concerned in high metacognitive self individuals.

What might seem surprising is that high metacognitive self individuals reveal a higher general tendency of committing the confirmation bias than low metacognitive self individuals. It could be expected for the persons who are aware of their cognitive biases to be able

to restrain from using them, yet the results present that the consciousness of one's own irrationalities is not enough to prevent people from showing them. In fact it works in an opposite way, it increases the tendency to use biases in social perception of others such as the confirmatory strategy.

We suspect, in light of a pragmatic perspective which focuses on the adaptive and socially useful aspects of biases, that the tendency to commit the confirmation bias (which is typical of high metacognitive self individuals) when testing a hypothesis about a personality trait of another person can be treated as a social skill. It is because the preference for questions that match the initial hypothesis suggests a higher empathy and is better seen from the partner's of the interaction point of view e.g. when talking to a person who tends to be an introvert, it is a manifestation of better social skills to ask, "*Do you feel uncomfortable in social situations*?" rather than, "*Do you enjoy noisy parties*?" (Dardenne, Leyens, 1995). The issue needs further investigations.

The metacognitive self, based on the idea of metacognition, is a new construct in psychology. Therefore more studies should be done in order to fully describe and explain its role in human cognitive and social functioning. Among others, further investigation should be conducted to confirm the influence of metacognitive self on social perception. The results should be replicated also with a use of other types of cognitive biases.

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