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Cognitive mechanism of conformity

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Cognitive Mechanism of Conformity

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Chapter 1

General Introduction

Social cognition emerged in the 1970s and 80s as an attempt to answer social-psychological questions by adopting experimental techniques and theoretical concepts from cognitive psychology. In the process of developing social theories, social psychologists eventually came upon the inevitable question: what are the cognitive mechanisms that can explain those theories? More importantly, is there a need to explain social phenomena from the cognitive perspective? In an attempt to answer those questions, a new scientific term was coined: “social cognition” - a sub-topic of social psychology that focuses on the role that cognitive processes play in social interactions.

However, to a certain degree, social psychology has always been concerned with social cognition, so the methods introduced by cognitive approach during the 1970s did not represent major changes in the content being studied. As Zajonc (1980) pointed out, it was rather the degree to which the processes going on within the brain could be understood. Indeed, most founding figures of social psychology (e.g., Kurt Lewin, Gordon Allport, Solomon Asch, etc.) had a distinctly cognitive orientation, with one of the main points of their analysis being a perceiver’s thoughts on the social stimuli and situations. Take, for example, the studies of conformity performed by Solomon Asch.

In his initial study on conformity (Asch, 1951), Asch invited his participants to compare a line to three other lines and choose the one best matching in length. Though the correct response was obvious on most occasions, the participants preferred to follow the group’s opinion even when it was incorrect. Asch initially expected nearly all students to choose the correct response irrespective of the group’s opinion, so the actual results surprised the whole scientific community of that time.

Though most of the initial studies on conformity offer pure social explanations of the behavior, there has always been an attempt to understand (if only on an abstract level) the processes going on in the mind of the perceiver, stating that the conformity effect reflects a belief in the superior knowledge of the group (Asch, 1951), or that people conform to the group’s norms and values because they want to be accepted by the group (e.g., Brauer & Chaurand, 2010). With the emergence of social cognition as a separate (sub-)discipline of social psychology, the researchers took this problem to the next level and tried to take a closer look at the cognitive mechanism underlying the social phenomena. Recent studies attempt to find a plausible cognitive explanation for the conforming behavior, but, what you mostly see is merely a description of the underlying neural processes (e.g., Shestakova et al., 2012; Stallen & Sanfey, 2015). And though the idea of this modern approach is to find a mechanistic explanation of this social phenomenon, I believe that explaining the neural processes underlying the

behavior could be better described as a pseudo-mechanistic explanation trying to categorize the studied behavior rather than explain it. I will get back to this point later, but for now I can say that I believe that a true mechanistic approach would look for a cognitive theory that is able not only to explain the conformity but also to predict the occurrence of the behavior.

But not only had social psychology started developing an interest in cognitive psychology: the interest turned out to become mutual. Basically, if social cognition attempted to introduce cognitive methods to the studies of social phenomena, the social approach towards cognitive psychology tried to look at the studied content from the opposite side: introduce social approach into cognitive studies. Most cognitive studies have been concentrating on individual minds and brains in isolation. However, people do not live and act in isolation. Human actions emerge as a result of interactions with the surrounding world and other people. As stated by Knoblich (2006): "...reassessing perception, action planning, and motor control in the light of their potential social roots might reveal that functions traditionally considered hallmarks of individual cognition originated through the need to interact with others." In fact, one can argue that all human cognition is social in its nature to some extent. In order to fully understand human behavior, the social aspect had to be taken into consideration. If you agree with this, it becomes obvious that clear-cut separation between cognitive and social psychology is at least difficult, if not impossible. As Hommel (2006) put it: "I doubt that characterizing and distinguishing between cognitive and social psychology in terms of the phenomena looked at makes sense." However, as both sub-disciplines have their own approach towards human behavior, combining both paradigms presents a certain challenge. Studies combining social and cognitive approaches demonstrate that a simple attempt to assign any social phenomenon under an existing cognitive category (or neural process) does not really work. Same as introducing social aspects into a cognitive process and further working with correlational evidence is not enough. Such an approach does not offer a truly mechanistic explanation of the phenomenon studied, but rather describes it from various perspectives. One thing is clear: we need a new approach if we want to fully understand cognitive nature of human behavior.

In my research I use conformity as an example of social phenomena and make an attempt to find a plausible cognitive theory that can not only accurately describe the mechanism of this social behavior but also predict its occurrences under various conditions. The main purpose of my studies has been to look for a new approach towards research of social phenomena in the field of social cognition. Together with my supervisor, professor Bernhard Hommel, I came up with an idea to apply the Theory of Event Coding (Hommel, 2009) to the studies of conforming behavior and use the Theory of Event Coding (TEC) as a cognitive theory that should not only explain the behavior but also predict it. In my opinion, TEC offers a plausible framework for explaining conforming behavior. According to TEC, an event (perceived or produced) is coded by human brain in terms of its features, making no

principal distinction between “self” or “others” (Hommel, Colzato & van den Wildenberg, 2009; Hommel, 2009), so that perceived and produced events, when consisting of similar features, would be coded approximately the same way. In such a situation, at the stage of retrieval, those events might be easily confused with each other resulting in retrieval of a false memory, thus, producing a “conforming” effect. The less a person distinguished between him/herself and the others, the higher the effect. I will talk about TEC in more detail in the following chapters.

The main goal of this thesis was to find a cognitive mechanistic explanation for one of the most common social phenomena: conformity. Besides finding and applying a cognitive theory to a social behavior, other questions that I approach here are:

- How are social phenomena affected by developments in society, and how do these changes find reflection in cognitive processes underlying them?
- How does a truly mechanistic approach differ from most current approaches offering a cognitive explanation for social phenomena?
- What statistical problems can one face when using or creating an experimental paradigm for a study?

At the end of this thesis, I will also look at the possibilities of applying my theoretical approach to further studies of social behaviors and processes within different cultural and economic settings.

Chapter overview

This dissertation is based on three empirical studies and one theoretical paper, each of which creates content for a separate chapter.

Chapter 2. For my initial study I used a paradigm adopted from a number of experiments studying conformity. That was the paradigm proposed by Klucharev et al. (Klucharev, Hytönen, Rijpkema, Smidts, & Fernández, 2009; Shestakova et al., 2012) where participants were offered a number of pictures of female faces and were asked to rate their attractiveness (I will explain this paradigm more detailed later in my thesis). When confronted with other students’ rating of the same pictures participants were consistently changing their initial rating in the direction of the rating they were confronted with. The level of conformity under the proposed paradigm was very high in all the studies using it (Klucharev et al., 2009; Shestakova & et al., 2012). In my opinion TEC was a perfect theory that offered not only a plausible explanation to such a behavior but also could predict conforming behavior under various circumstances. In order to check my hypothesis I created a study where participants were offered a feedback on their ratings under the two different conditions: social (“other students’ ratings”) and non-social (random computer choice). According to TEC theory

there should be no difference in conformity levels between these two conditions. And indeed the study that I performed showed convincing evidence in support of this theory.

Chapter 3. The paradigm that I adopted from Klucharev et al. turned out to have an issue: there was a serious concern that the results of the studies using this method might have been affected by Regression to the mean (Ihmels & Ache, 2018; Kim & Hommel, 2018). In order to test whether this was really the case, I have conducted a test experiment that basically replicated my initial study from Chapter 2 but was lacking the experimental condition: participants were not confronted with alternative ratings but were just asked to rate the same pictures twice in two separate sessions. The results of this test study were similar to the results of the initial studies described in Chapter 2 which confirmed the statistical fault of the paradigm. It did not mean though that my initial theoretical explanation of the conforming behavior was wrong. I needed to find another paradigm that would address the statistical issues of the previous one but would still make it possible to test my hypothesis. Please notice that I added here a footnote (1) after the publication of the paper because the results of the on-going experiment I refer to in this paper differed slightly from the final results of the experiment (Chapter 4).

Chapter 4. To perform a follow up study I developed a new study design that addressed the statistical issues of the previous studies. Instead of rating a picture on a scale 1 to 8 in my new study participants were offered a choice between two pictures excluding any possibility of regression to the mean to affect the statistical analysis of the results.

At the same time in my follow up study I have also looked at the possibility of the culture influencing conforming behavior, namely collectivistic versus individualistic trends affecting the level of conformity (Kim & Hommel, submitted). The cognitive mechanism that I initially proposed for conforming behavior (based on TEC) suggests that conformity occurs when the subject does not distinguish well between performed and observed actions when creating and retrieving any particular event file, namely the choice of a preferred picture in my experimental design. It was natural to assume then that people in collectivistic countries would be less inclined to oppose oneself to others (and therefore less inclined to differentiate between own and others actions) than people in individualistic societies. Indeed I found some results supporting this theory, however the main conclusion of this study was that in general across all cultures people do not show higher conformity under a social condition when the observed choice is believed to be performed by other individuals than under a nonsocial condition when the observed choice is believed to be random and performed by a computer.

Chapter 5. In this theoretical paper I take a closer look at the modern possibilities to join cognitive and social perspectives on human behavior. Based on the studies of conformity that I have performed for this thesis (Chapters 2-4), I attempt to demonstrate in this paper that the time has come to adopt a new approach for studying social behaviors. Simply describing them from cognitive perspective is not enough: mechanistic theorizing is needed in order to not only explain the behavior but also predict it under various sociohistorical circumstances. As I try to show here, developing mechanistic theories for social phenomena is not only possible but necessary to eliminate the boundaries between cognitive and social accounts of human behavior. Please notice that I added two footnotes (2 & 3) after the publication of the paper. Footnote 2 refers to the origin of the Figure 1 that I used in the paper. Footnote 3 refers to the results of the on-going experiment I mentioned in this paper that differed slightly from the final results of the experiment (Chapter 4).

Chapter 6. In the final chapter of this thesis I summed up the results and conclusions of my research, looking critically at the issues that I faced during my work. At the same time I proposed several possible ways to continue the research in the field of social cognition using the tools and ideas I created while working on my thesis. In my opinion the results of my studies offer an interesting perspective for further development of cognitive approach towards studies of social phenomena: mechanistic theorizing.

Chapter 2

An Event-Based Account of Conformity

Based on: Kim, D., & Hommel, B. (2015). An event-based account of conformity. *Psychological Science*, 26 (4), 484–489.

ABSTRACT

People often change their behavior/beliefs when confronted with deviating behavior/beliefs of others, but the mechanisms underlying such phenomena of conformity are not well understood. Here we suggest that people cognitively represent their own actions and others' actions in comparable ways (theory of event coding), so that they may fail to distinguish these two categories of actions. If so, other people's actions that have no social meaning should induce conformity effects, especially if those actions are similar to one's own actions. We found that female participants adjusted their manual judgments of the beauty of female faces in the direction consistent with distracting information without any social meaning (numbers falling within the range of the judgment scale) and that this effect was enhanced when the distracting information was presented in movies showing the actual manual decision-making acts. These results confirm that similarity between an observed action and one's own action matters. We also found that the magnitude of the standard conformity effect was statistically equivalent to the movie-induced effect.

Keywords: Conformity; Theory of Event Coding (TEC); adaptive behavior

In 1951, Solomon Asch reported one of the most famous experiments in the history of psychology. He had participants watch confederates who judged the length of lines and often made obvious errors. When subsequently requested to make these judgments themselves, almost all participants went along with the confederates' incorrect judgments at least sometimes. Post experimental interviews revealed that the participants did not really believe in the answers they gave, which led Asch to the conclusion that this conformity effect reflected a belief in the superior knowledge of the group. Since then, Asch's study has been replicated in various forms and versions (Cialdini & Goldstein, 2004), and the results have overwhelmingly supported the classical finding. Conformity refers to changing one's attitude or behavior to be in line with the social norms accepted by other people (Baron, Byrne, & Branscombe, 2007; Cialdini & Goldstein, 2004), and most authors agree that people conform to the group's norms and values because they want to be accepted by the group (e.g., Brauer & Chaurand, 2010). Humans have a tendency to adopt behaviors of others for social purposes: to facilitate bonding of people into social groups with functional relationships. This adaptation (a form of conformity) happens rather automatically through mimicking other people's behaviors (Chartrand & Bargh, 1999; Lakin, Jefferis, Cheng, & Chartrand, 2003). Interestingly, conformity effects can occur in the physical absence of other people if participants are merely informed about the opinion of a group they personally do not know, such as "foreign students" (Klucharev, Hytönen, Rijpkema, Smidts, & Fernández, 2009; Shestakova et al., 2012). This runs counter to the assumption that conformity reflects the need to belong to the group whose values one encounters, but it seems consistent with Asch's (1951) assumption that the belief in the superior knowledge of the group is responsible for the effect.

The aim of the present study was to test whether even simpler mechanisms may account for at least some conformity effects. This idea was motivated by the theory of event coding (TEC), which posits that both produced and perceived events (i.e., action plans and perceptual representations of actions) are coded (a) in terms of their features and (b) in a common format (Hommel, 2009; Hommel, Müsseler, Aschersleben, & Prinz, 2001). TEC does not differentiate between the self and others, so actions performed by oneself and actions performed by another person are coded in roughly the same way (Hommel, Colzato, & van den Wildenberg, 2009)—even though one commonly has more information (e.g., proprioceptive, anticipatory, and historical) about one's own action. Experiencing a self- or other-performed action is assumed to lead to the creation of an *event file*, in which action-related feature codes and codes representing the perceptual context are bound together (Hommel, 2004). Event files operate according to a pattern-completion logic, so that the retrieval or stimulus-induced reactivation of one code spreads to the other components (Kühn, Keizer, Colzato, Rombouts, & Hommel, 2011).

Applying this reasoning to a typical conformity study results in the following interpretation: A participant who watches someone judge a stimulus will create an event file that binds the judgment action to the stimulus, much as if the participant had judged that stimulus him- or herself. When the participant encounters the same stimulus again, this reactivates the event file, which creates a response conflict between the judgment action that the participant was thinking of and the judgment action that the observed person performed. Response conflicts are known to slow down reaction time and lead to occasional errors, and the latter effect is consistent with Asch's (1951) observation. This logic also applies to more recent versions of the conformity paradigm (e.g., Klucharev et al., 2009; Shestakova et al., 2012; Zaki, Schirmer, & Mitchell, 2011), in which participants judge a stimulus themselves before they are presented with some "group opinion." If we assume that a participant stores these two events in a comparable format, when the participant is subsequently asked to judge the same stimulus again, this encounter with the stimulus will retrieve both event files, and the participant may not even know which of the reactivated judgment actions was his or her own. Accordingly, the participant's later judgments will be biased toward some average of his or her previous judgment and the group judgment—which is in fact what has been observed (Shestakova et al., 2012).

A unique feature of our account is that it does not require any specific status of the supposed group opinion the participant is confronted with: The participant does not need to know or believe that the response presented as group opinion is representative of group-related judgment, nor does he or she need to assume that the response is related to, or has any meaning for, the current task. We therefore tested the hypothesis that even unrelated, meaningless "judgments" (which we refer to as *intervening events*) that participants encounter between two of their own judgments of the same stimulus (in two separate sessions) would bias their second judgments toward the value indicated by the intervening event. The second hypothesis we tested refers to the perceptual similarity between people's own judgments and the intervening event. TEC assumes that overt and covert actions are cognitively represented by codes of their perceptual features, so greater perceptual similarity between one action event and another should lead to greater overlap of the features in the actions' event files. Accordingly, greater perceptual similarity between participants' initial judgments and the intervening event should yield more pronounced conformity effects.

EXPERIMENT 1

Our experimental design was based on the study of Shestakova et al. (2012) and Klucharev et al. (2009), in which participants judged the beauty of same-gender faces. However, instead of presenting any normative group-related information after participants entered their first judgment

of a given face, we presented either a static slide with a number within the range of the scale or a short movie showing a female finger pushing a number button on a keyboard similar to the keyboard used by the participants (see Fig. 1). Participants were not given any reason for this presentation, and they were not encouraged to attend to it.



Figure 1. *Examples of the intervening events, which appeared either as a static number between 1 and 8 (left panel) or as a short movie with a female hand pushing a number button on a keyboard (here number 4).*

Method

Participants

Twenty female right-handed psychology students (aged 18-24 years) participated for a small compensation of 6 EUR or 2 study credits. No male participants were admitted to avoid cross-gender effects related to our stimuli (Cloutier, Heatherton, Whalen & Kelley, 2008). The sample size represents the Leiden lab standard for novel manipulations with unknown effects sizes.

Stimuli

Our face stimuli were 220 pictures of Caucasian females taken, with permission, from the same database that was used by Shestakova et al. (2012). As in that study, only female pictures were used because crossgender rating of attractiveness is related to mate selection (Cloutier et al., 2008). The pictures were presented on a computer monitor using E-Prime (Schneider, Eschman, & Zuccolotto, 2012).

Procedure

Prior to the experiment, all the participants read and signed an informed-consent form; the study was described as aimed at identifying the features that contribute to the attractiveness of female faces. In the first experimental session, participants rated the pictured faces on an 8-point

scale ranging from 1 (*very unattractive*) to 8 (*very attractive*); they entered their responses by pressing the corresponding number button on the keyboard in front of them using their right hand. Participants were informed that after each judgment they would see a number or short movie that would require no action on their part. After we made sure that all the instructions were well understood, participants were presented with the 220 pictures, one by one and in random order. Each rating was followed by an intervening event in the form of a number slide or a movie (the type of event was randomly chosen, but the two types appeared roughly equally often). The number value (implied rating) represented in the intervening event was equal to the participant's own judgment (roughly one third of the cases), 1 to 3 points higher than the participant's own judgment (roughly one third of the cases), or 1 to 3 points lower than the participant's own judgment (roughly one third of the cases). After participants evaluated all 220 pictures, they were offered a short break (20 min). In the second experimental session, the same 220 pictures of female faces were presented (in random order) for a second evaluation, this time without any intervening events. At the end of the experiment, all the participants were debriefed about its real purpose.

Analysis

The conformity effect (the effect of the intervening event) was calculated as the change between a participant's first and second rating of the same face. This change was calculated separately for the trials on which the implied rating in the intervening event was equal to the participant's first judgment (*equal condition*), 2 to 3 points lower than the participant's first judgment (*lower condition*), and 2 to 3 points higher than the participant's first judgment (*higher condition*). We then analyzed mean rating change in a repeated measures analysis of variance (ANOVA) with direction of the intervening event (higher than vs. equal to vs. lower than the first judgment) and format of the intervening event (number vs. movie) as independent variables. ANOVA results were Greenhouse-Geisser adjusted in the case of significant Mauchley effects.

Results

On average, participants rated the attractiveness of the presented faces lower on the 2nd session (3.75) than on the 1st session (4.06), indicating a small shift of the overall reference frame. In line with our first hypothesis, the change from the first to the second judgment was affected by the intervening event: faces were rated most negatively after lower intervening events and most positively after higher intervening events (see Figure 2). This was confirmed by a significant Direction effect, $F(2, 38) = 35.87$, $p < .001$, $\eta^2p = 0.65$. Within-subject contrasts indicated that the equal condition differed significantly from both the lower condition, $F(1, 19) = 25.96$, $p < .001$, $\eta^2p = 0.58$, and the higher condition, $F(1, 19) = 12.50$, $p < .01$, $\eta^2p = 0.40$. Hence, we were able to demonstrate a

conformity effect in the absence of another person and without presenting any normative or otherwise socially meaningful judgments.

Our second hypothesis was not supported by the data, however. There was not any indication that the conformity effect might depend on the format of the intervening event; the corresponding interaction was far from significance, $F(2, 38) = 0.02$, $p = .97$, $\eta^2p = 0.001$.

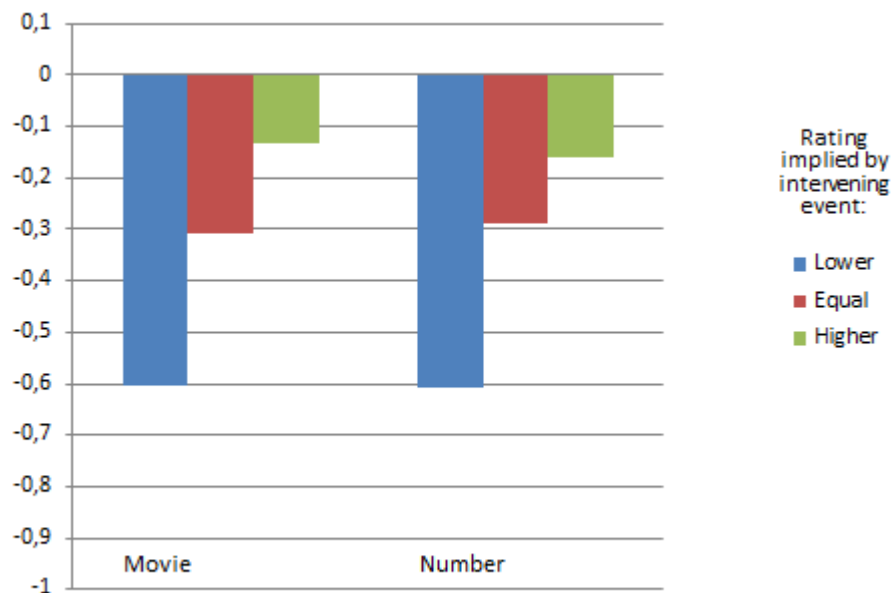


Figure 2. Experiment 1: mean change in face attractiveness ratings on the 2nd as compared to the 1st experimental session, as a function of the format and the direction of the intervening event.

Discussion

Even though the outcome of this experiment provides some evidence for our event-based approach to conformity, it would be premature to jump to conclusions regarding the presence of the conformity effect and the absence of the predicted similarity effect. First, even though we did nothing to encourage participants to interpret the intervening events as representing anything related to other people's opinions, the participants may very well have developed such an interpretation on their own, especially as we did not provide any explanation for presenting the numbers and movies. Accordingly, we conducted Experiment 2, which provided such an explanation. Second, using a within-participants trial-to-trial manipulation of the format of the intervening event might not have been the most effective way to make similarity effects visible. Experiencing random mixtures of different formats of the same kind of information can be argued to induce a more categorical representation of that information, so that participants might not have represented the

shown values as numbers vs. number-targeted actions—which would effectively prevent similarity effects. Accordingly, we used a between-participants manipulation of format in Experiment 2.

Method

The method of this experiment was the same as in Experiment 1 with the following exceptions: The format of the intervening event was manipulated between participants; 20 new students (ages 18–30 years) were presented with number slides only, and another 20 new students (ages 18–28 years) were presented with movies only. The instructions were the same as in Experiment 1 except that they explicitly mentioned that the intervening events (the numbers or movies) were intended to distract the participant, that the values were chosen randomly, and that they did not represent anyone’s opinion.

Results

Again, the overall rating dropped a bit from the first judgment (3.97) to the second judgment (3.73), indicating a small shift of the reference frame. More importantly for our purposes, there was again a highly significant main effect of Direction, $F(1.63, 62.10) = 29.88, p < .001, \eta^2p = 0.44$, indicating that participants were systematically affected by the intervening event (see Figure 3). Also of interest, this conformity effect was mediated by an interaction of Direction and Format, $F(1.63, 62.10) = 6.71, p < .005, \eta^2p = 0.15$, showing that the direction effect was stronger for movies than it was for numbers. Separate ANOVAs revealed that the Direction effect was significant for both numbers, $F(1.36, 25.74) = 6.02, p < .05, \eta^2p = 0.24$, and movies, $F(1, 19) = 26.66, p < .001, \eta^2p = 0.58$. For movies, the equal condition was again significantly different from both the lower condition, $F(1, 19) = 23.18, p < .001, \eta^2p = 0.55$, and the higher condition, $F(1, 19) = 4.41, p < .05, \eta^2p = 0.19$. For numbers, the equal condition was significantly different from the lower condition, $F(1, 19) = 7.14, p < .05, \eta^2p = 0.27$, but not from the higher condition, $F(1, 19) < 1$. This pattern supports our second hypothesis by showing that greater similarity between the participant’s own judgment action and the intervening event leads to a stronger impact of the latter.

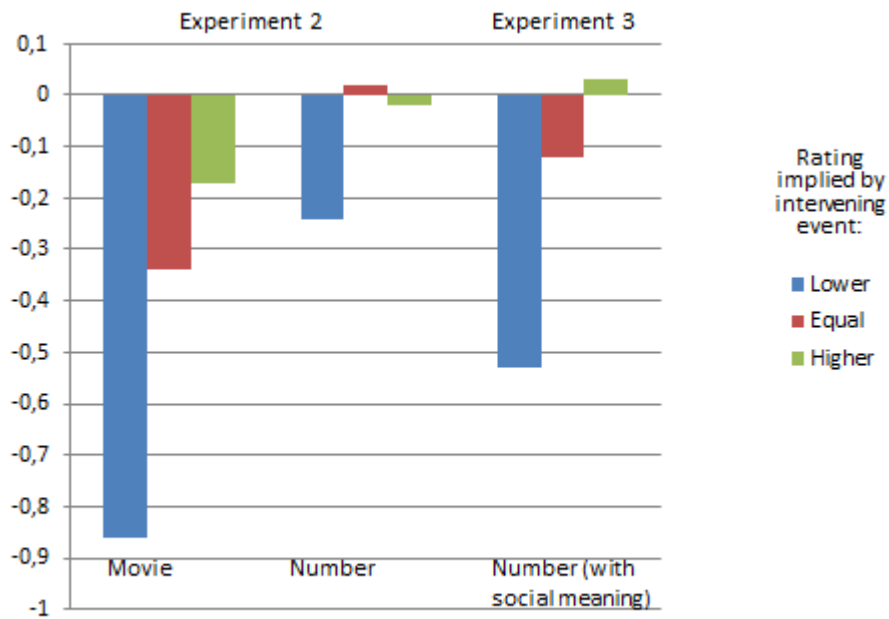


Figure 3. *Experiment 2 and 3: mean change in face attractiveness ratings on the 2nd as compared to the 1st experimental session, as a function of the format and the direction of the intervening event.*

Discussion

As expected, conformity effects were obtained even with instructions that emphasized the irrelevance of the intervening events and encouraged participants to ignore them. Moreover, the finding that the conformity effect was larger in the movie condition than in the number condition supports the hypothesis that the effect is modulated by the similarity between the intervening event and the participant's own judgment action.

EXPERIMENT 3

The previous experiments demonstrated that conforming behavior occurs even in the absence of any social factors, suggesting that such factors are not necessary to create or explain conformity effects. However, it is possible that social factors increase the effect. To test this possibility we conducted Experiment 3, where we combined our experimental design with the design and instruction used in previous, more traditional studies on social conformity (e.g., Klucharev et al., 2009; Shestakova et al., 2012; Zaki et al., 2011). Thus, we replicated the number part of Experiments 1 and 2 but made participants believe that the numbers would represent the average ratings of a reference group.

Method

Except for the instructions given to participants, the method was the same as in Experiment 2, with numbers as intervening events. In this experiment, the instructions explicitly mentioned that the intervening events represented the average ratings of the photos by the students of Leiden University. Accordingly, the experimental design was very close to the design used by Klucharev et al. (2009) and other researchers.

Results

Again, the mean rating dropped from the first judgment (4.18) to the second judgment (3.97), indicating a small shift of the reference frame. There was again a highly significant main effect of Direction, $F(2, 38) = 22.86, p < .001, \eta^2p = 0.52$, indicating that participants were systematically affected by the intervening event (see Figure 3, Experiment 3). To see whether adding social meaning to the intervening event affects the strength of its influence on the rating change, we compared the results of the Experiment 3 with the results from the number condition of Experiment 2. A repeated measures ANOVA with the participant's mean rating change as dependent variable, "Direction" of the intervening event (higher vs. equal vs. lower as compared to first judgment) as within-participants independent variable and "Social meaning" (number "representing group's opinion" vs. "random" number) as between-subjects variable revealed that the conformity effect was mediated by "Social meaning" (i.e., experiment), $F(1.46, 55.55) = 3.86, p < .05, \eta^2p = 0.09$. This shows that the direction effect was stronger for numbers with added social meaning. Another ANOVA compared the results of Experiment 3 with the movie condition of Experiment 2, but there was no evidence of an interaction between the direction of the intervening event its format (experiment), $F(1.70, 64.51) < 1$. Hence, the conformity effects induced by the movie condition and the standard manipulation are statistically equivalent.

CONCLUSIONS

Taken altogether, our findings demonstrate that adding social meaning to the intervening event is not required in order for conformity effects to occur: simply being exposed to another event that bears some relationship and similarity to one's own action can change one's behavior in similar situations in the future. Even though we obviously had no full control over the thoughts of our participants, we see no reason or evidence why they might have interpreted the numbers and movies they experienced as meaningful social actions of other people or even groups that might possess superior knowledge. This is not to say that such interpretations cannot play any role in

inducing conformity under some circumstances, but they are clearly not necessary to induce behavioral and judgmental conformity.

However, a direct comparison between the number conditions with and without social meaning revealed that adding social meaning can increase the conformity effect. Interestingly, this increase did not go beyond the effect obtained in the meaningless movie condition, suggesting that social implications of an otherwise meaningless event are functionally equivalent to the similarity of this event to one's own action. This might be due to one or both of the following reasons. For one, there is evidence that the actual or implied presence of other people attracts attention (Dolk et al., 2014; Friesen & Kingstone, 1998; Langton, Watt & Bruce, 2000). If we assume that the movie condition in Experiment 2 had a the greater effect than the number condition because of its more attention-attracting dynamic characteristics, it is possible that the lack of attentional saliency of the number condition was compensated by adding attention-attracting social implications to it in Experiment 3. For another, showing the actual manual judgment (as in the movie condition) and adding judgment-related aspects to the number presentation (as in Experiment 3) both can be assumed to increase the similarity between the intervening event and the participants own judgment actions, which according to TEC should increase the effect. Note that the two possible factors might interact, so that increasing attention to the intervening effects makes their similarity with one's own action more salient.

In any case, it is interesting to note that the principles and concepts we made use of to predict and interpret our present findings have been developed for entirely different, not dedicatedly socially purposes. This implies that at least some aspects and phenomena of social conformity emerge from domain-general characteristics of the human cognitive system. As we have pointed out, this system represents one's own actions and actions of other people in comparable ways (Hommel et al., 2001; Prinz, 1990), which facilitates imitation and other forms of social learning including, as the present findings suggest, the acquisition of social norms and rules. Our findings also suggest that perceptual similarity between observed actions and one's own actions promotes the transfer from one to another, which fits with observations that people one is sharing features with (such as virtual models that look just like oneself: Bailenson, 2012) are more likely to have an impact on one's own behavior.

AUTHOR CONTRIBUTIONS

Both authors contributed to the development of the study concept, data analysis and interpretation, and they both approved the final version of the manuscript. Testing and data collection were performed by D. Kim. D. Kim drafted the manuscript and B. Hommel provided critical revisions.

Chapter 3

Reply to Ihmels and Ache (2018): Event-Based Conformity Versus Regression to the Mean

Based on: Kim, D., & Hommel, B. (2018). Reply to Ihmels and Ache (2018): Event-based conformity versus regression to the mean. *Psychological Science*, 29(7), 1193–1194.

In a previous article, we ([Kim & Hommel, 2015](#)) challenged existing social-psychological accounts of conformity ([Asch, 1951](#)) by arguing that what looks like conforming behavior might simply emerge from a failure to distinguish between observations of one's own behavior and that of others. We tested this idea by adopting the experimental design of Klucharev and colleagues ([Klucharev, Hytönen, Rijpkema, Smidts, & Fernández, 2009](#); [Shestakova et al., 2012](#)), in which participants rate the faces of unfamiliar same-gender individuals twice—once before and once after they are exposed to what they are made to believe is the average rating of the same faces by an important reference group. Under these conditions, the participant's second rating tends to be biased by the intervening event: It becomes more positive or negative if the group rating was more positive or negative, respectively, than the participant's first rating. We replicated this observation but found the same bias if the "reference-group rating" was replaced by an intervening event without any social meaning, such as the presentation of visual numbers falling within the range of the judgment scale or of movies of a hand pressing a key with a corresponding number. We felt that this finding ruled out a social account of the bias but suggested instead that participants may simply store both their own judgment and the intervening event (without keeping track of the authorship) in corresponding event files ([Hommel, 2004](#); [Hommel, Müsseler, Aschersleben, & Prinz, 2001](#)) and then, when encountering the same face again, retrieve the available event files and report some (possibly weighted) average of the response they imply.

In their commentary, [Ihmels and Ache \(2018\)](#) argue that the very effect we intended to explain may actually not exist—at least not in the design we adopted from [Klucharev et al. \(2009\)](#) and other researchers. As Ihmels and Ache demonstrated in a reanalysis of our data, statistically correcting for possible regression-to-the-mean effects makes the conformity effect disappear. This might point to a statistical artifact, but other interpretations are possible: The effect may be real but restricted to extreme ratings, which individuals might be more prone to "correct."

We therefore decided to test the regression-to-the-mean account directly by replicating our basic experiment (for details of the method, see [Kim & Hommel, 2015](#); for data and further details see https://osf.io/7hf98/?view_only=c5202c0826e24763b1b20708dc055028) without the intervening event. Sixteen Dutch female participants were simply presented with the same set of pictures showing female faces in two experimental sessions and were asked to judge their attractiveness on a scale from 1 (*very unattractive*) to 8 (*very attractive*). Because we used the same program as in our original study, we constructed the pseudovisible "direction" based on the (now withheld) intervening event that we would have presented in the original study (a judgment equal to, 1–3 points lower than, or 1–3 points higher than the first rating of the participant). As expected, an

analysis of variance (ANOVA) of the changes in the attractiveness ratings produced a significant effect of direction, $F(1.33, 19.93) = 7.39$, $p < .01$, $\eta_p^2 = 0.33$, which in a Bayesian ANOVA indicated very strong evidence ($BF = 38.233$). These findings provide direct support for Ihmels and Ache's argument that the shift in the ratings that we previously took as a conformity effect occurs even in the absence of the intervening event, presumably reflecting regression to the mean.

Given that our design was used in numerous previous demonstrations of “conformity effects” as well, these observations suggest that such effects no longer exist—which would feed earlier reports of a decline of conformity effects in Western societies ([Bond & Smith, 1996](#)). It is thus possible that the original observations of [Asch \(1951\)](#) and contemporaries were so much interwoven into the zeitgeist of their times that they reflected more of a historical peculiarity than a universal aspect of human behavior (cf. [Gergen, 1973](#)). Interestingly, the degree to which stimuli trigger the retrieval of event files can be controlled ([Colzato, Steenbergen, & Hommel, 2018](#); [Keizer, Verment, & Hommel, 2010](#)), and the degree of that control relies on cultural metacontrol biases toward cognitive persistence (in individualistic cultures) or flexibility (in collectivistic cultures; see [Hommel & Colzato, 2017](#)). If we consider the fact that our participants hailed from The Netherlands, a country in the Top 5 on Hofstede's international individualism scale ([Hofstede, Hofstede, & Minkov, 2010](#)), our null finding would be consistent with the assumption that conformity reflects stimulus-induced event-file retrieval. If true, this suggests that more robust conformity effects can be found in more collectivistic societies. Indeed, in a recent follow-up study we successfully demonstrated, in a new design that made regression-to-the-mean effects impossible, that Chinese participants tested in China show significantly stronger conformity effects than Western European participants tested in The Netherlands¹.

Author Contributions

D. Kim and B. Hommel developed the study concept. Both authors contributed to the study design. Testing, data collection, and data analysis were performed by D. Kim. D. Kim and B. Hommel both wrote the manuscript, and B. Hommel provided critical revisions. All authors approved the final version of the manuscript for submission.

Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

¹ The follow-up experiment demonstrated a tendency towards stronger conformity of Chinese participants under social condition but no significant interaction effect between conformity, conditions and countries

Chapter 4

Conformity: A cross-cultural comparison

Based on: Kim, D., & Hommel, B. (2021). Conformity: A cross-cultural comparison. Submitted

Abstract

Increasing evidence suggests that social conformity declines in modern Western societies. In the present study, we compared conformity behavior in four countries that differ in individualism/collectivism (the Netherlands, the United States, India, and China) under a new experimental paradigm that eliminates methodological problems of earlier designs. Participants were presented with 100 pairs of pictures and had to choose the one they preferred, before they were confronted with the same or an opposite choice that they were told to represent either the choice of a relevant reference group (a condition with social relevance) or a random, computer-generated choice (a condition without social relevance), and then finally judged the picture pairs for a second time. Conformity-like effects were obtained for all four countries, irrespective of their degree of individualism/collectivism, and in both relevance conditions. This suggests that conformity effects are not moderated by culture or social relevance but produced by generic cognitive mechanisms.

Keywords: Conformity; Theory of Event Coding (TEC); Individualistic / Collectivistic Culture

Since the famous study performed by Asch (Asch, 1951), the phenomenon of social conformity has been extensively investigated. In his original study, Asch asked his participants to judge the length of a line after the confederates would have made their judgments (often obviously incorrect). Almost all participants went along with the obviously wrong judgment at least sometimes. Post-experimental interviews revealed that the participants did not really believe in the (confederate-biased) answers they gave, which led Asch to the conclusion that this conformity effect reflects the belief in the superior knowledge of the group. Since then, Asch's study has been replicated in various forms and versions varying from more or less direct replications of Asch's original experiment (e.g., Cialdini & Goldstein, 2004; Perrin & Spencer, 1980, 1981; Vlaander & van Rooijen, 1985) to exploring conformity behavior under different paradigms and in different cultural groups (Klucharev, Hytonen, Rijpkema, Smidts, & Fernandez, 2009; Berry, 1967). In many conformity studies, participants are rating a series of stimuli, such as the perceived beauty of unfamiliar faces, and are then confronted, after each rating, with the ratings of a relevant reference group, such as students from the same university (e.g., Shestakova, Rieskamp, Tugin, Ossadtchi, Krutitskaya & Klucharev, 2012). Somewhat later, participants are asked to rate the same stimuli again, and the common observation is that they change the previous rating into the direction of the rating of the reference group (i.e., rate the stimulus lower than before if the group rating was lower, and rate the stimulus higher than before if the group rating was higher than the participant's first rating)—the conformity effect. Interestingly for our present purposes, it has been noticed that conformity effects are strongly influenced by cultural norms of the group and do not seem to stay stable over the time, especially in Western individualistic societies, which have seen a continuous decay of the size of the effect (Bond & Smith, 1996).

As alluded to already, the conformity effect is commonly ascribed to the “wisdom of the group”, and it has been suggested that participants intentionally adjust their rating in order to reduce the difference between their own and the group rating (Asch, 1951). Most authors agree that people conform to the group's norms and values because they want to be accepted by the group (e.g., Brauer & Chaurand 2010). Hence, people are assumed to adopt behaviors of others to facilitate bonding of people into social groups with functional relationships. However, recent analyses of the cognitive and neural mechanisms underlying conformity behavior in humans (for overview, see Stallen & Sanfey, 2015; Wu, Luo & Feng, 2016) might suggest a different view. Of particular relevance for the present study, Kim and Hommel (2015) had proposed an account of conformity phenomena that does not consider any contribution of dedicated social mechanisms. They claimed that the Theory of Event Coding (TEC) offers a framework for explaining conforming behavior that is both plausible and more explicit than other available approaches with respect to the underlying

psychological mechanisms. According to TEC, an event (perceived or produced) is cognitively and neurally coded in terms of its features, making no principled distinction between “self” and “other” (Hommel, Colzato & van den Wildenberg, 2009; Hommel, 2004, 2009, 2015), so that perceived and produced events are coded in a common format (Prinz, 1990) and integrated with each other. If so, rating a stimulus would lead to the integration of the stimulus and its rating and to the storage of this binding. If then participants would store not only their own rating event but also the rating event of the reference group (i.e., the binding of the to be rated stimulus and the rating score of this group), they might retrieve both bindings when facing the stimulus another time and re-rate the stimulus by taking the (perhaps weighted) average of the retrieved ratings—thus producing a “conforming” effect.

Among other things, this cognitive account predicts that the social nature of the group rating would be unnecessary to create “conformity” effects. While presenting a rating as coming from a relevant reference group might increase attention to the rating, which after all is irrelevant for the actual task, and may thus make processing this rating more likely, it should also be possible to induce conformity-like effects by presenting intervening events without any social nature. Indeed, Kim and Hommel (2015) found no principled difference between “social” and “non-social” conditions: participants were influenced by numbers representing possible ratings irrespective of whether these numbers were presented as representing the scores of a reference group or as numbers being randomly produced by a computer, or whether a movie of a hand pressing a number key in the rating range was played. However, Kim and Hommel’s experimental paradigm raised some concerns about possible artifacts, as the method to calculate the conformity effect (which was adopted from Klucharev et al., 2009. and Shestakova et al., 2012) could have been contaminated by a regression to the mean (Ihmels & Ache, 2018). In fact, what had looked like a conformity effect could be reproduced in a control study without any intervening event (Kim & Hommel, 2018), a finding that the regression-to-the-mean approach would predict. While this does not rule out the non-social account of Kim and Hommel, it does question whether real conformity effects exist at all. Given that Bond and Smith (1996) reported a very substantial continuous decrease of the effect size in the mid-1990s already, it may very well be that statistically unbiased paradigms no longer give rise to measurable conformity effects. Hence, Asch’s effect might be a “child of its time” (Perrin & Spenser, 1981) rather than a replicable and robust phenomenon.

Given this state of affairs, we developed a novel paradigm that prevents regression-to-the-mean effects and tested whether substantial conformity effects could be obtained with this paradigm. To test for possible cultural effects, we considered four countries with very substantial differences with respect to the individualistic or collectivistic nature of their culture: the Netherlands and the United

States, which according to Hofstede's individualism scale (Hofstede, Hofstede & Minkov, 2010) are in the top five of the most individualistic countries worldwide (scores of 80 and 91 out of 100 possible, respectively), as well as India and China, which despite visible trends towards individualization (Van de Vliert, Yang, Wang & Ren, 2013) have much lower scores (48 and 20, respectively). We also compared a condition with social relevance, which would be comparable with previous studies of conformity, and a condition without any social relevance, as used by Kim and Hommel (2015). Social theories of conformity would predict that conformity-like effects should be obtained in the condition with social relevance only but not in the non-social condition, whereas the cognitive approach of Kim and Hommel (2015) would predict that both conditions should generate conformity-like effects.

In order to avoid any statistical issues, we replaced the typical rating response by a forced choice paradigm. In each trial, participants were presented with two pictures shown simultaneously and were asked to choose the one they liked more. The intervening event would then consist of either the same response or the alternative response, in which case a change of response choice under the second test should be more likely. To reduce the cultural specificity of the previous paradigm, we decided to replace the previously used pictures of Caucasian female faces (Kim & Hommel, 2015) by more culturally neutral stimuli. Conformity effects were assessed by means of our new, confound-free version of the stimulus-rating task, which however kept the basic experimental logic of previous conformity studies: participants were presented with two pictures of plants or flowers and were to choose the one they preferred before being exposed to a choice that they were told to represent either (the "social" condition) the average judgment of the students of the same university (in the lab-based experiments) or of other participants (in the web-based experiments) or a choice that was randomly generated by the computer (the "non-social" condition). Thereafter, participants were presented with the same stimuli and were again to choose the preferred picture. A conformity-like effect would express itself by making preference changes from the first to the second choice more likely after having been exposed to a different preference as compared to the same preference. As in the previous study (Kim and Hommel, 2015), we also manipulated the social versus non-social nature (i.e., the format) of the intervening event.

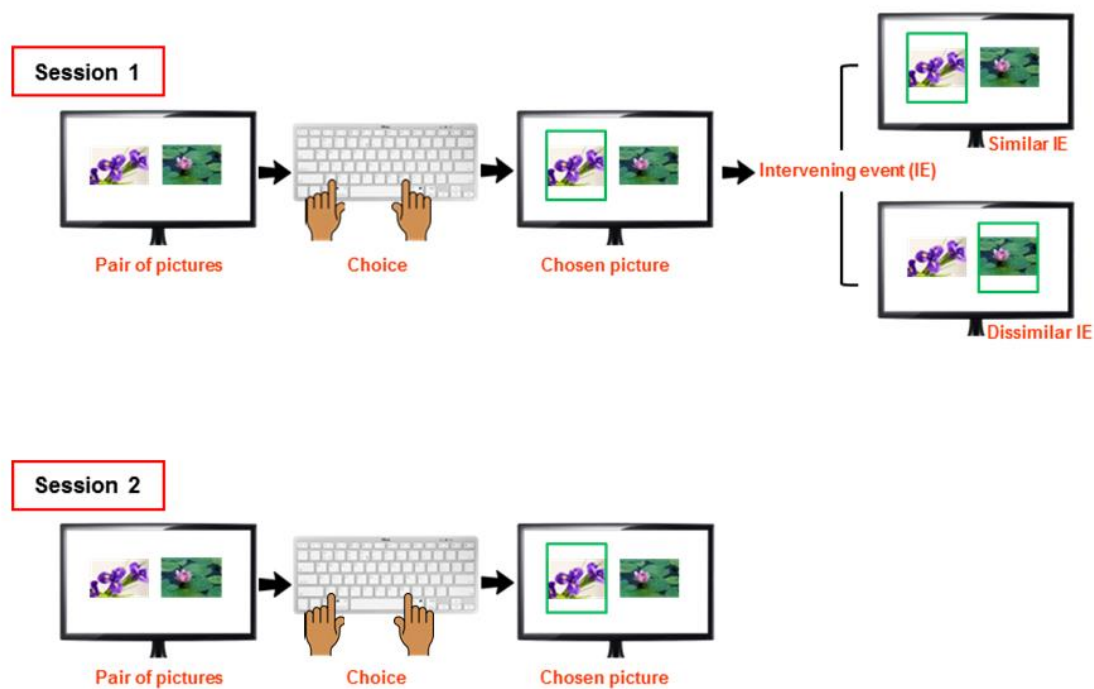
Method

We tested participants from four different countries in total. However, participants from two countries (the Netherlands and China) were tested in the university laboratories (at Leiden University and Southwest University, respectively), while participants from the other two countries (the USA and India) were tested online. 80 European students from Leiden University (age 17-33, mean age 21.15, 14 males) and 80 Chinese students from Southwest University (age 19-23, mean age 20.02, 22

males) participated under the lab condition. All of them were recruited via the university student recruitment websites accessible mainly (but not exclusively) to psychology students. Given that the national roots of Dutch students, and of Dutch citizens in general, is more diverse than of those in the Chinese sample, we will refer to the two groups as (mainly Northwestern) European and Chinese, respectively. 116 participants from the USA (age 20-69, mean age 35.26, 79 males) and 121 participants from India (age 23-56, mean age 29.87, 82 males) participated under online conditions. All of them were recruited through the online crowdsourcing service Amazon Mechanical Turk (MTurk). Note that the online groups were somewhat larger, because we also intended to test at least 80 participants per country and 40 per condition but couldn't control the exact number of registrations to the experiments. Participants from each country were randomly assigned to one of two conditions: "social" or "non-social", resulting in N=40 for all four experimental groups tested in the lab, N=56 in the "social" condition and N=60 in the "non-social" condition for the American participants, and N=55 and N=66 for the Indian participants, respectively.

Each participant took part in a single testing session of about 45 minutes. At the beginning of the experimental session, participants were asked to read and sign the informed consent form, and then fill in a short demographic questionnaire (age, gender, and country of origin). Participants were informed that the aim of the experiment was to investigate the factors contributing to the esthetical values of the pictures. Due to the fact that we had no control over diversity of the participants recruited on-line via MTurk, we decided to ask them to complete two additional questionnaires that may allow us to understand possible unexpected differences between the groups tested in the lab and those tested online. The first questionnaire assessed the personal attitude of the participant on an individualistic/collectivistic scale. It consisted of 16 statements and participants were requested to indicate how much they agree or disagree with each statement (e.g., "I'd rather depend on myself than others") on a 1 – 9 scale (1 = never or definitively no, 9 = always or definitively yes). The second questionnaire assessed participants tolerance to ambiguity (adopted from Herman, Stevens, Bird, Mendenhall & Oddou, 2010). It consisted of 12 statements and participants were requested to indicate how much they agree or disagree with each statement (e.g., "I avoid settings where people don't share my values") on a 1 – 5 scale (1 = Strongly Disagree to 5 = Strongly Agree and a 3 = Neither Agree nor Disagree). See Figure 1.

Figure 1. Schematic representation of the sequence of events occurring on each trial of the conformity task



Immediately after filling in the respective forms and questionnaires, participants performed the experimental task consisting of two phases separated by an interval of 10 minutes. We created 100 set pairs from 200 pictures of plants and flowers and had participants decide, in each trial, which of the two presented pictures they found more attractive. The pictures were presented on a computer monitor and participants indicated their choice by pressing the Z and the M keyboard button for the left or right picture, respectively, which would trigger the brief appearance of a green frame surrounding the chosen picture. Immediately thereafter, the same pair of pictures was presented with one of the pictures also surrounded by a green frame (intervening event, IE)—either the same picture that was chosen by the participant or the other picture (with a probability of around 50% each: varying between 47% and 53%). In the “social” condition, participants were informed that the IE represents the average choice of the other participants of the experiment. In the “non-social” condition, participants were informed that the IE was randomly chosen by the computer and was only used to separate the trials. In both conditions, participants were informed that the IE would not require any further action on their side. A short break (10-20 minutes) followed, during which participants in the lab could take a break doing what they wanted and on-line participants were asked to watch a 10-minutes documentary on the history and chemistry of colour, and to indicate every time when the visual scene changed. The extra control condition was introduced due to the on-

line character of the experiment offering less controlled environment and therefore demanding more measures to introduce as little variability in such environment as possible. Thereafter, the same 100 pairs (presented in random sequence) were to be judged the same way, this time without any IE (Figure 1). At the end of the experiment all participants were debriefed about the real purpose of the study.

Results

For each participant, we calculated the percentage of stimulus pairs for which participants' choice changed from the first to the second session as a function of whether the intervening event referred to the same picture as the initial choice (same IE or sIE) or to the other picture (different IE or dIE). Frequencies of choice-changes were submitted to a repeated-measure ANOVA with groups (European vs. Chinese vs. American vs. Indian) and format (social vs. non-social) as between-participant variables and similarity (sIE vs. dIE) as a within-participant variable. The analysis yielded three significant effects: A main effect of similarity, $F(1, 389) = 18.37$, $p < 0.001$, $\eta_p^2 = 0.04$, indicated that choice changes were more frequent with dIEs ($M = 0.30$, $SD = 0.14$) than with sIEs ($M = 0.27$, $SD = 0.13$)—the conformity effect. A main effect of country, $F(3, 389) = 70.79$, $p < 0.001$, $\eta_p^2 = 0.35$, reflected that choice changes increased from Europe (.18) over China (.23) and the US (.31) to India (.38). Finally, there was a two-way interaction between country and format, $F(3, 389) = 2.74$, $p = .043$, $\eta_p^2 = 0.02$. Country-wise ANOVAs showed no effect of format for groups from Europe, US, and India, $F_s > 1.6$, $p_s > .21$, but a significant effect for China, $F(1, 78) = 5.94$, $p = .017$, where choice changes were more frequent for the social than the non-social format (.04 vs. 0). Importantly, however, even this effect was independent from similarity, as indicated by the absence of a significant three-way interaction, $F(93, 389) = 1.83$, $p = 0.14$, $\eta_p^2 = 0.01$. (See Table 1).

Table 1. *Conformity effect calculated per region and per format (social / non-social) as a difference between percentage of the judgement change with different intervening event and same intervening event.*

Country	Format	<u>Similarity</u>		Conformity Effect
		Same	Different	
Northern Europe	Social	.160 (.08)	.163 (.08)	.003
	Non-Social	.189 (.10)	.207 (.10)	.017
China	Social	.206 (.08)	.248 (.09)	.043
	Non-Social	.225 (.09)	.223 (.09)	-.001
USA	Social	.330 (.13)	.349 (.15)	.019
	Non-Social	.277 (.13)	.301 (.14)	.024
India	Social	.362 (.13)	.404 (.11)	.042
	Non-Social	.372 (.12)	.389 (.12)	.018

Even though we did not obtain outcomes that would have suggested systematic differences between the more homogeneous groups tested in the lab and the more heterogeneous groups tested online, we used results from the questionnaires filled in by the two online groups to run some exploratory correlational analyses. However, Pearson 2-tailed correlation analyses did not reveal any significant correlation between the conformity effect (calculated as a difference between percentage of the choice change with dIE and with sIE) and the scores for the tolerance to ambiguity questionnaire: $r(237) = .070, p = .286$; the scores on the collectivistic scale (calculated as the difference between total scores on collectivistic scale and total scores on the individualistic scale), $r(237) = .126, p = .053$; or age, $r(397) = .065, p = .195$.

Discussion

We developed a new, artifact-free paradigm to assess whether people change their choice of stimuli after having been presented with information about how others have judged the same stimuli. Our findings suggest that this paradigm is sufficiently sensitive to pick up the impact of such intervening events and can thus effectively replace previous artifact-prone paradigms to assess conformity. Of particular interest, we obtained a highly significant effect of similarity, which represents the conformity effect, and this effect was comparable across all four countries we considered. Given that these countries are assumed to differ substantially with respect to the individualistic/collectivistic nature of their culture, our findings suggest that conformity-effects exist and are not sensitive to

cultural impact. Hence, even though social accounts of conformity effects would suggest that such effects are less pronounced in more individualistic countries, our present observations do not confirm these expectations. We do note, however, that our exploratory correlational analysis yielded a correlation between conformity and the individual collectivistic orientation of our participants that at least approached the significance criterion. Assuming that such an effect might become significant with an even larger sample than ours (or with one-tailed testing in our present sample), this observation leaves the possibility that, irrespective of the embedding culture, more collectivistically oriented individuals might show a somewhat larger conformity effect.

A second observation is also of considerable theoretical interest: we did not find any evidence suggesting that the presence and size of the conformity effect might depend on the social nature of the intervening event. Even the only interaction in which format was involved, the one between format and country, did not involve similarity. That is, our findings provide evidence that at least in Chinese participants, social and non-social comparisons might work differently, this affects choices as such (i.e., changes in judgment irrespective of the relationship between one's own judgment and the one presented in the intervening event), but not the conformity effect proper. In other words, intervening events with substantial social relevance changed the behavior of participants not any stronger than intervening effects without such relevance. This fits with the predictions of Kim and Hommel's (2015) cognitive account of conformity effects and converges with our present observation that culture has no measurable impact.

Taken altogether, our findings provide strong evidence for the assumption that people are sensitive to intervening events that associate to-be-judged stimuli with other responses than their own, but the social nature of these intervening events is irrelevant. This raises doubts in the assumption that conformity effects reflect dedicated social mechanisms and represent something like consideration of "the wisdom of the group". Rather, people do not seem to distinguish between stored stimulus-response bindings that they generated themselves and binding that were generated by others. This ability may very well generate conformity: behavioral choices are very likely to be affected by stored stimulus-response bindings ("event files" in the terms of Hommel, 2004), so that being exposed to many people that all respond to particular stimuli in the same way would be more likely to make a person showing the same response. However, this does not seem to require any social intention or any socially dedicated mechanism.

The data and materials for all experiments are available at OSF (<https://osf.io/ky7z4/>) and none of the experiments was preregistered. The Leiden University Psychology Research Ethics Committee approval has been obtained for both lab and on-line parts of the experiment (CEP17-0329/167 and 2017-03-29-D.A. Kim-V1-678).

Chapter 5

Social cognition 2.0: Towards mechanistic theorizing

Based on: Kim, D., & Hommel, B. (2020). Social cognition 2.0: Towards mechanistic theorizing. *Frontiers in Psychology* 10:2643. doi: [10.3389/fpsyg.2019.02643](https://doi.org/10.3389/fpsyg.2019.02643).

ABSTRACT

Social cognition emerged in the 1970s and 80s as an attempt to answer social-psychological questions by adopting experimental techniques and theoretical concepts from cognitive psychology. Recently, cognitive psychologists began to build complementary bridges between cognitive and social psychology by showing increasing interest in the cognitive implications of social situations. Here we take a closer look at the remaining obstacles to join cognitive and social perspectives on human behavior. Using conformity as an example, we attempt to demonstrate that the social-cognition approach has been successful in adopting cognitive concepts and experimental methods, but is still lagging behind with respect to (1) mechanistic theorizing, as it often engages in merely describing phenomena in terms of reasons rather than explaining it in terms of causes; and (2) reflecting the sociohistorical context of the phenomenon under investigation. As we try to show, developing mechanistic theories for social phenomena, including the effects of individual differences and their sociohistorical dependencies, is not only possible but necessary to eliminate the boundaries between cognitive and social accounts of human behavior.

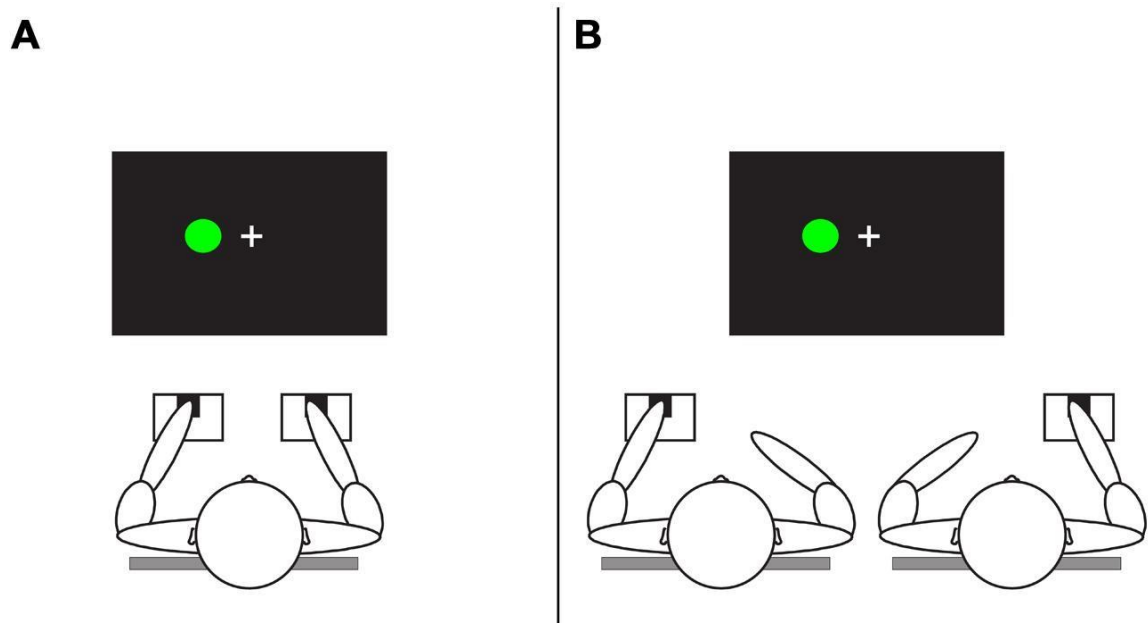
Keywords: Conformity; Theory of Event Coding (TEC); adaptive behavior

Social cognition, a “field of psychology concerned with the mental processes through which we perceived, think about, and act toward other people and in response to situational factors” (Amodio, 2019), emerged in the 1970s and 80s, as a result of adopting experimental techniques and theoretical concepts from cognitive psychology. In contrast to more sociological or behavioristic approaches, the social cognition approach tries to understand social thought and behavior from an individualistic perspective that considers the way information about social events is processed, stored, and used. This emphasis on individuals has been criticized (e.g., Taylor & Brown, 1979), and we do not intend to claim that the social cognition is the best or only way to understand social behavior. And yet, the social-cognition approach does provide an interesting and stimulating interface between cognitive and social research and theorizing, which is particularly important as the increasing interest of social psychologists in cognitive processes has recently been echoed by an increasing interest of cognitive psychologists in social situations and the cognitive implications thereof (Hommel, 2006).

This interest was fueled by surprising observations that what cognitive psychologists considered well-established, almost hard-wired cognitive effects can be strongly affected by the real or even imagined presence of other people. Take the notorious Simon effect (Simon, 1969), which indicates that speeded responses to stimuli are faster and more accurate if the stimulus spatially corresponds to the location of the response, even if stimulus location is irrelevant to the task. The classic effect has been replicated hundreds, perhaps thousands of times across different variations of the basic design, the stimuli, and the responses (e.g., Hommel, 2011). It is commonly attributed to response conflict, the idea being that, when stimulus and response do not correspond, the intentional response conflicts with the response that is automatically triggered by the stimulus location, which in turn may lead to an error or a delay that reflects resolution of the conflict (e.g., Kornblum, Hasbroucq & Osman, 1990). If so, one would expect that the effect disappears if the participant responds with only one key to only one of the stimuli, rendering the task a “go-nogo task”, because in this case the correct response can already be prepared long before the stimulus appears. This is indeed what studies have shown (Hommel, 1996). However, if such a go-nogo version of the task is performed in the presence of another person who operates the other key to respond to the other stimulus (see Fig. 1), the effect comes back—the so-called Joint Simon effect (JSE; Sebanz, Knoblich & Prinz, 2003).

Figure 1

Schematic representation of Standard Simon Task (A) and Joint Simon tasks (Ruissen and de Bruijn, 2016).²



The discovery of the JSE has been considered to show that people automatically co-represent other people and their tasks and to demonstrate “the fundamental social nature of perception and action” (Knoblich & Sebanz, 2006). While more recent findings have challenged the assumption of automatic co-representation (Dolk, Hommel, Colzato, Schütz-Bosbach, Prinz & Liepelt, 2014) and speculations about “social nature” do not seem to contribute much to understanding the underlying mechanisms, the observation of the JSE and related phenomena demonstrate that even the most basic cognitive effects are not immune to the social environment and the real or imagined presence of others. This in turn renders any clear-cut separation between cognitive and social psychology or phenomena questionable (Hommel, 2006)—irrespective of whether one assumes that all social behavior is actually cognitive in nature or whether one prefers the opposite perspective. However, the increasing methodological overlap between the cognitive and social sciences notwithstanding, integrating insights from both fields still faces considerable challenges. In the following, we highlight

² In the original article, there was a mistake in the legend for Figure 1. Schematic representation of standard Simon task (A) and joint Simon tasks (B). The figure was originally created by (Ruissen and de Bruijn, 2016). The correct legend appears below.

Figure 1. Schematic representation of standard Simon task (A) and joint Simon tasks (B). (Ruissen and de Bruijn, 2016).

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

two of them: non-mechanistic theorizing about social effects and insufficient attention for the historicity and cultural boundedness of social phenomena. We will discuss both issues in the context of social conformity, by drawing on some, partly rather unexpected recent findings from our lab.

NON-MECHANISTIC THEORIZING

Conforming behavior has always been an interesting social phenomenon attracting the attention of many social psychologists in all times. In his most famous, but at the same time most controversial study, Asch (1951) demonstrated that people easily change their opinion when confronted with deviating opinions of others. His participants were to choose the one out of three visual lines that would match a reference line in length. Even though the correct response was obvious, participants were strongly affected by deviating judgments of other participants, who in fact were all confederates, and followed the group's opinion even when it was incorrect. Asch himself initially expected participants to choose the correct response irrespective of the group's opinion, so the actual results surprised him as much as the entire scientific community at that time.

How can we explain this kind of behavior? Social-psychological accounts have claimed that conformity effects reflect the belief in the superior knowledge of the group (Asch, 1951) and suggested that people conform to the group's norms and values because they want to be accepted by it (e.g., Kelman, 1958). While we do not doubt the validity of these claims, they remain descriptive and do not amount to a truly mechanistic explanation. Social-psychological "explanations" refer to the possible reasons of conformity behavior rather than to the actual causes, and thus favor the personal level of explanation over the more appropriate functional or systems level. If we are to understand social behavior by referring to and analyzing the information-processing operations underlying it, explanations should be restricted to this functional/systems level of description rather than to the personal level at which the to-be-explained phenomenon is defined. Failing to do so is likely to result in re-describing the phenomenon in pseudo-explanatory terminology, rather than revealing the actual mechanistic underpinnings (Hommel, 2019). Neuroscientific "explanations", in turn, have merely demonstrated that conformity behavior goes along with neural activity that has also been shown to go along with other (e.g., conflict-inducing) behavior that is similar to conformity behavior. For example, in the study of Klucharev (Klucharev, Hytonen, Rijpkema, Smidts, & Fernandez, 2009), results demonstrated that when individual judgements differed from those of the group, activity in the medial prefrontal cortex (area generally known to be involved in the processing of conflict) increased, while activity in the nucleus accumbens, an area associated with the expectation of reward, decreased. Again, we do not doubt the validity and importance of these

observations, but they hardly provide a mechanistic principle that would really explain the phenomenon.

We conclude that the social cognition approach was successful in bringing into play cognitive methodological techniques and cognitive theoretical concepts, but it did not yet make the decisive step of engaging in truly mechanistic theorizing. In order to do so, social cognition approaches would not only need to include cognitive concepts in the explanation of phenomena but also to delineate exactly how the interaction of cognitive operations causally generates the phenomena. A truly mechanistic approach needs to look for a cognitive theory that goes beyond re-describing or provide personal reasons to produce effects like conformity by providing a mechanism that allows researchers to systematically predict such behavior under various conditions.

To become more explicit with respect to the needed level theorizing, and to provide a concrete example case, we refer to a recent attempt of ours (Kim & Hommel, 2015) to explain key characteristics of conformity by using basic principles of the Theory of Event Coding (TEC), a general theory of the interactions between human perception and action (Hommel, Müsseler, Aschersleben & Prinz, 2001). We would like to emphasize that our goal is not to defend our particular approach at this point, but will use it only as an example for the degree of theoretical detail and specificity that we think is needed for the next generation of social cognition approaches—Social Cognition 2.0 (a term we borrow from Amodio, 2019) that is. We also admit that our approach does not account for all available conformity-related observations. In the original Asch (1951) experiments, participants carried out their judgments in the presence of confederates. This introduces motives of justification and self-presentation, as obvious from self-reports showing that some participants knew that the answer of the group was wrong but they apparently didn't dare to give a deviant answer. Later approaches have focused more on the after-effects of information about majority opinions and judgments of a relevant reference group, such as in the studies described below (i.e., changes of one's judgment of a given object or issue to make it more compatible with a majority vote), and it is only these kinds of after-effects we will be addressing in the following.

Our account of the impact of majority judgments on the future behavior of participants was motivated by TECs claim that both produced and perceived events (i.e., action plans and perceptual representations) are coded in terms of their features and in a common format (Hommel et al., 2001; Hommel, 2009), and that it does not differentiate between representing "me/self" and "others" (Hommel, 2018). Accordingly, actions performed by the individual him-/herself and the actions performed by someone else should be coded in comparable ways (Hommel, Colzato & van den Wildenberg, 2009)—even though one commonly has more (e.g., proprioceptive, anticipatory,

historical) information about one's own action (Hommel, 2018). Given TECs further assumption that co-activated event codes tend to be bound into event files (Hommel, 2004), experiencing a (self- or other-performed) action should lead to a binding of action-related feature codes to codes representing the perceptual context (i.e., the stimuli inducing the action, the object on which it is carried out, and the situation in which that happens). Event files operate according to a pattern-completion logic, so that the retrieval or stimulus-induced reactivation of one code spreads to the other components (Kühn, Keizer, Colzato, Rombouts & Hommel, 2011).

Given these assumptions, we reasoned, conformity-related changes in judgment might thus have nothing to do with group wisdom or group norms but rather reflect a mix-up of event files reflecting one's own action history and event files reflecting the actions of others. If, say, an individual reacts to a stimulus line by judging it to be 2 cm long, she would store an event file that integrates perceptual codes of the stimulus features and the response "2 cm". Perceiving nine other people reacting to the same stimulus by judging it to be 3 cm long would lead to the storage of nine event files that integrate stimulus features with the response "3 cm". Even if event files coding one's own action might enjoy more attention or stronger weighting, encountering the stimulus on another occasion would still tend to retrieve 10 event files with most of them suggesting another than the correct response. Given the notorious strong impact of (memories of) past responses on present performance (Lewin, 1922a,b), what looks like conformity may simply be the failure to properly discriminate between one's own (correct) response and the (incorrect) response(s) of one's co-actor(s).

To test this possibility, Kim and Hommel (2015) adopted the experimental design of recent conformity studies (Klucharev et al., 2009; Shestakova, Rieskamp, Tugin, Ossadtchi, Krutitskaya & Klucharev, 2012) and had participants rate 220 pictures of female faces for attractiveness on a scale 1 to 8. After their own evaluation, participants were presented with what they were led to believe was the rating of the same face by other students of their university—an important reference group. After a short break, participants were asked to rate the same faces again. Replicating previous studies, we found significant changes in the ratings into the direction of the rating of a reference group: higher scores if a reference group found the face more attractive and lower scores if they found it less attractive. Importantly, we included a second group of participants that was also presented with other ratings after having rated each face themselves, but the cover story did not mention any possible reference group. Rather, participants were told that the numbers were randomly chosen and function as distractors to make the task more difficult. Given our theoretical background, we expected that the mere exposure to an alternative "response" (even in the absence of any social indication of it) would result in an adjustment of participants' rating behavior in the

second rating session. Indeed, even in the absence of any social cover story, participants demonstrated “conformity” by adjusting their second rating into the direction of the presented number (Kim & Hommel, 2015).

We hasten to add that this observation must not be taken as unequivocal evidence for the validity of our theoretical background. As argued by Ihmels and Ache (2018) and partly confirmed by Kim and Hommel (2018), the paradigm used by Kim and Hommel (2015) and previous researchers is sensitive to regression-to-the-mean effects, which implies that the effect that Kim and Hommel (2015) were able to extend to non-social conditions was actually not a real conformity effect. What we do want to emphasize, however, is that we consider our approach the first truly mechanistic account of conformity behavior which allows for much more specific predictions than the previously suggested descriptive accounts.

AHISTORICAL THEORIZING

A major objection against the application of cognitive theories to social phenomena may be based on the fact that cognitive approaches address processes that rely on millions of years of biological evolution while social phenomena can change even within the lifespan of one generation. This problem was voiced by Gergen (1973), who argued that laws and principles of social interaction vary over time, so that “theories of social behavior are primarily reflections of contemporary history”. If so, phenomena we observe today may become weaker tomorrow and even cease to exist the year after, sometimes due to that reporting and discussing a phenomenon might work back and speed up eliminating the phenomenon; e.g., studying and discussing obedience to authority may reduce the likelihood of finding obedience in citizens.

A related aspect of social behavior is its cultural variability. Similar social situations can evoke different behavioral responses in members of different cultures, historical traditions, and religions, different gender roles, even different emotional reactions and different neural responses (Han & Ma, 2014) to life events like death or childbirth. This suggests that culture has a strong impact on basic cognitive aspects of human brain functioning. Indeed, a number of seminal studies by Nisbett and colleagues, who have strongly revived the interest in cultural factors, found that people growing up in East Asian cultures such as China and Japan tend to develop more holistic thinking styles, whereas people brought up in Western cultures like Australia and the USA tend to develop analytic thinking styles, with severe consequences for the way global and local information is processed (e.g., Nisbett, Peng, Choi & Norenzayan, 2001). Along the same lines, members of collectivistic (e.g., Catholicism or Buddhism) and individualistic (e.g., neo-Calvinism) religions show profound differences in cognitive-control styles (Hommel & Colzato, 2017).

Take again conformity as an example. After Asch's famous experiment (1951), many replications of the study followed exploring which factors contributed to the main effect, such as the obviousness of the correct response, group size, or gender composition of the group (e.g., Larsen, 1990; Bond, 2005). But not all replications were successful. In fact, effect sizes decreased systematically over decades and even tended to disappear in the most recent studies (Bond, 1996), which according to Perrin and Spenser (1981) suggests that Asch's study was a "child of its time" by reflecting the high level of social obedience of 1950s in the USA that disappeared as a consequence of the rise of individualistic values. And yet, successful replications of the Asch's observations are still reported even in the Western World in the last two decades of the 20th century (e.g., Vlaender & van Rooijes, 1985; Abrams et al., 1990). Could this be a sign that Gergen was correct in claiming that social phenomena cannot be studied in the lab?

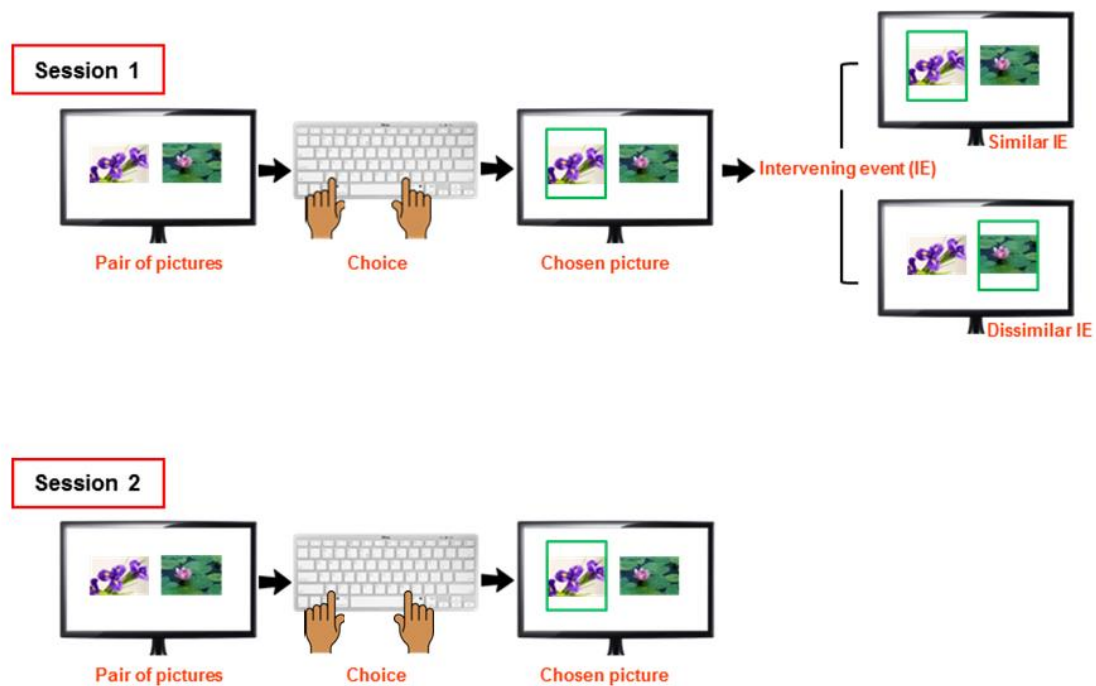
We would like to argue that, on the contrary, Gergen's challenge calls for more mechanistic theorizing based on systematic laboratory research. Historical processes and the dynamics of social phenomena they imply do not stand in the way of more rigorous theorizing but rather provide useful constraints for building theories that embrace historical processes and make them part of the modeling process. Hence, we need mechanistic models that can explain exactly how historical changes impact cognitive processing and the phenomenon under investigation. For example, Hommel and Colzato (2017) have suggested that differential emphasis on commonalities versus distinctions between events and individuals in collectivistic and individualistic cultures provide selective social feedback for the development of a more integrative or a more discriminative cognitive processing style, which eventually establishes a corresponding default bias. A more integrative bias would increase, and a more focused bias would reduce the amount of social information considered in a decision, which in the latter case would reduce and eventually eliminate phenomena that rely on the processing of social information, such as conformity. If so, conformity effects should be easier to find in more collectivistic societies.

To test this prediction, Kim et al. (2022, submitted) created a novel paradigm for testing conformity effects that avoids methodological problems like regression-to-the-mean effects. Participants saw 110 pairs of pictures (plants and flowers) and chose the one they liked more. As in previous studies, participants were then confronted with the opinion of "others" before they were tested again to see whether deviating opinions of "others" changed their judgement (see Fig.2). To compare collectivistic and individualistic cultures, we tested participants in the Netherlands, a country in the top-5 Hofstede's Individualism/Collectivism Scale (Hofstede, Hofstede & Minkov, 2010, with 80 out of 100 Individualism points), and China (20 Individualism points), which despite a visible trend towards individualization has remained much more collectivistic in comparison (Van de Vliert,

Yang, Wang & Ren, 2013). We found a significant main effect of conformity in the Chinese but not in the Dutch sample, suggesting that the Dutch students were ignoring the social information. This suggests that conformity behavior is not hardwired but emerges from an interaction between cultural biases and situational salience of social information. Rigorous mechanistic theorizing can capture both of these factors and make specific, and increasingly precise predictions that are open to laboratory testing.³

Figure 2

Schematic representation of the sequence of events occurring on each trial of the conformity task of Study 2.



³ The follow-up experiment demonstrated a tendency towards stronger conformity of Chinese participants under social condition but no significant interaction effect between conformity, conditions and countries

CONCLUSIONS

Lewin (1952) claimed that nothing is as practical as a good theory, and we claim that this holds in particular for the understanding of social phenomena. While the social-cognition approach has been successful in adopting cognitive concepts and experimental methods, it is still lagging behind with respect to mechanistic theorizing and still way too often engages in merely describing phenomena in terms of reasons rather than explaining it in terms of causes. As we tried to show here, developing mechanistic theories for social phenomena is possible (see also Pfister et al., 2019, for a mechanistic account of rule-breaking), and there is no reason to shy away from using these theories to also account for the impact of historical development, cultural and individual variability, and environmental dynamics. In other words, the time is ripe for Social Cognition 2.0.

AUTHORSHIP

Both authors contributed to the development of the article concept and they both approved the final version of the manuscript. D. Kim drafted the manuscript and B. Hommel provided critical revisions.

Chapter 6

General discussion

General discussion

In my research I attempted to look at the cognitive explanation for one of the most studied social behaviors, namely conformity. Together with my supervisor, Prof. Bernhard Hommel, I went a long way creating a plausible cognitive theory that could explain and predict an occurrence of conformity, testing it, admitting to mistakes in the experimental design and finally testing an adjusted theory under a new paradigm.

Theoretical framework and summary of empirical studies

I started my research with an idea to find a plausible cognitive theoretical framework for one social phenomenon: conforming behavior. In my opinion, the Theory of Event Coding (TEC) was the cognitive theory that offered a good basis for building this framework. In order to test my idea, I conducted an experiment using an existing study design adopted from previous studies of conformity (Klucharev, Hytönen, Rijpkema, Smidts, & Fernández, 2009; Shestakova et al., 2012). In my study, however, I added one more experimental condition, namely a non-social group where participants were confronted not with what they thought were other students' alternative choices but with random computer choices, thus eliminating "social" factor from influencing their conforming behavior if such occurred. According to TEC, a simple confrontation with an alternative behavior would affect reproduction of your own behavior at a later stage (Hommel, Colzato & van den Wildenberg, 2009; Hommel, 2009). The study results supported my theory.

Unfortunately, the study paradigm that I used for my initial experiments had a statistical issue: the results were possibly influenced by Regression to the Mean that might have occurred as a result of the rating system (scale 1 to 8) used in the 1st and the 2nd experimental sessions (Ihmels & Ache, 2018; Kim & Hommel, 2018). That did not mean, however, that my theory was wrong. I still believed that TEC could offer a good theoretical basis for studying conformity and, possibly, other social phenomena. However, I had to create a new study design that would allow me to test my theory and avoid statistical issues of the previous one. As I mentioned above, the issue was caused by the system of rating used in this paradigm: an 8-point scale ranging from 1 (*very unattractive*) to 8 (*very attractive*). So, I decided to replace this rating with a "choice between two pictures" procedure. Instead of rating one picture, participants were asked to choose the one that they liked more of the two pictures. This study design eliminates any possibility of Regression to the Mean. At the same time, in my follow-up study I wanted to see if and how conformity was affected by culture; in particular, collectivistic versus individualistic culture. My idea was that people from more

individualistic cultures are better at separating “I” from “others” and, as a result, are less susceptible to the conformity effect. That required another change in the study design: I replaced pictures of Caucasian women by photos of plants and flowers (more culturally neutral stimuli).

This study was conducted partially in the lab (in the Netherlands and China) and partially online (in the USA and India). I tried to keep the study design as similar as possible for all experimental groups. The results of this study confirmed my initial hypothesis: the conformity effect did not differ across all experimental groups irrespective of the country or condition (social versus non-social), suggesting that people are sensitive to intervening events that associate to-be-judged stimuli with other responses than their own, but the social nature of these intervening events is irrelevant. I could not find any significant interaction effect between culture and conformity level, though there was a tendency towards higher conformity among the participants from collectivistic cultures (in particular China) under social conditions, which could mean several things:

- it is possible that the culture effect and interaction between culture and condition is very small and difficult to detect, therefore, it would require a much larger sample to find it
- conformity is not affected by culture and manifests itself equally across various societies;
- the difference between individualistic and collectivistic cultures is getting less pronounced nowadays.

Though my hypothesis has undergone certain changes as a result of the experiments I carried out testing it, the final conclusion, in my opinion, supports the initial idea: TEC is a plausible cognitive theory that can explain and predict conformity under various circumstances.

In Chapter 5 I looked critically at the modern approach towards social cognition and at the methodologies adopted in the present studies of conformity in general, and in the field of social cognition in a broader sense. Cognitive theories that are being applied to explain social phenomena can and should not only describe social phenomena from a cognitive perspective in terms of theories but rather explain and predict behaviors under various circumstances.

Further questions and directions

There are number of questions I tried to address in my thesis, to name just few:

Which factors affect conformity? My initial theory was that conformity was a result of exposure to alternative actions, produced by oneself or observed. Using TEC as my theoretical basis (Hommel, 2009; Hommel, Müsseler, Aschersleben, & Prinz, 2001), I proposed that people conform not because they are under any social pressure to do so, but mainly through the adjustment of their own event

file for the action as a result of being exposed to an alternative action. I discussed this mechanism in more detail in Chapter 2. If my theory was right, there would be no principal difference between people being exposed to an alternative action believing that such an action is an expression of an alternative opinion of other people (social condition) or a simple random action generated by a computer, for example, (non-social condition). My further research confirmed this idea.

However, more questions needed to be addressed looking at the factors that affect conformity. Does the phenomenon change over time? Some researchers in the field of social psychology suggested that conformity might have been a social phenomenon typical for the times of Asch (Perrin & Spenser, 1981). It is possible that the general trend towards individualistic values in modern societies across the world has weakened the susceptibility to conformity in general population. This idea would not contradict my theory: a person with higher individualistic characteristics is much stronger in cognitive separation of oneself from others and, therefore, less inclined to combine own and others actions in one event file. As a result, further reproduction of own initial action would be less affected by observed similar actions of other persons. However, testing a large group of participants still demonstrated the conformity effect suggesting that the cognitive mechanism underlying it is still valid (see Chapter 4). It is still possible, of course, that, due to the above mentioned factors, the effect has weakened over the time. An additional longitude study is needed to observe the development of the phenomenon in society over the time.

If we agree that an individualistic mindset is less susceptible to conforming behavior than a collectivistic one, then the next logic question would be: Does conformity manifest itself differently in various cultures? In particular, individualistic versus collectivistic cultures. In my cross-cultural study (Chapter 4) I attempted to address this question. I tested participants in four countries: the Netherlands, China, the USA and India (the latter two were tested online). These four countries differ in the level of individualism (Hofstede, Hofstede & Minkov, 2010), which gave me an opportunity to see if a particular culture influenced the conformity in a way that participants from more individualistic cultures would demonstrate lower levels of conformity than those from more collectivistic cultures. Though I did find such a difference after testing participants from the Netherlands and China (which was mentioned in Chapter 3 and Chapter 5: see footnotes 1 & 3), adding more participants from other countries revealed no significant effect of interaction between the conformity level and condition (social or non-social) and country. Please see Chapter 4 for more details and possible explanations of the results.

The main question I tried to address in this thesis, however, is whether there is a good cognitive mechanistic theory that can describe conformity. In my opinion, TEC offered sufficient grounds that

would allow to build a solid mechanistic explanation to this particular and, possibly, other social phenomena. The results of my experimental research fully supported my initial idea.

Besides conformity I believe that TEC offers a good framework for cognitive approach towards explaining and predicting various other social behaviors. In future studies it would be interesting to test it as a cognitive basis for a different social phenomenon, for example, marriage or fashion. For me as a person deeply interested in fashion, the latter would be a very appealing subject to study. It would be plausible to assume that the cognitive mechanism of compliance with fashion is in many ways similar to the mechanism of conforming behavior: after all, compliance with fashion is a form of conformity. On the other hand, fashion is often associated with esthetic values of a person or a social or cultural group. Does a mere exposure to a fashion look help to create an event file associated with this look and with its esthetic impression and, at a certain moment, adopt it as one's own? Can personal esthetic norms be manipulated in the same way as I manipulated conformity in my experiments? Another interesting thing about fashion is that it is a relatively rapidly changing social phenomenon. What was fashionable and looked appealing to us 10 years ago might look ugly and weird nowadays. Does that mean that our esthetic preferences are very unstable and can be easily manipulated? On the other hand, not all people are susceptible to fashion trends. In fact, some people are not affected by those trends at all. Is it because these people do not attend to fashion and therefore do not form any event files associated with it? Or are those people in general more capable of separating "self" from "others"? Can TEC account for those differences?

Another interesting social phenomenon that can be studied within the theoretical framework that I proposed in this thesis is marriage. How does a personal idea of marriage change through exposure to various forms and norms? Can we explain and predict it within the framework offered by TEC? Why is it that within the same cultural group you have individuals that comply fully with the most generally accepted form of marriage, yet, you have certain subgroups that form their own norms different from the mainstream? Do people in individualistic societies vary more from the general norm and, if so, how can we explain it from a cognitive perspective?

In fact I believe that any social phenomena can and should be studied from a cognitive perspective as such an approach is promising. An ability to predict social behaviors would give us a valuable tool for understanding and, more importantly, predicting changes and processes in modern societies.

Conclusion

In conclusion, social behaviors play an important role in human lives. Being able to explain them from a cognitive perspective is a challenge that modern field of social cognition is facing. Why do we

behave certain ways under certain circumstances, often irrespective of our cultural background, age or beliefs? What are the brain processes that can account for our behavior? Are those processes similar for all people or, if not, how they differ and why? Can those processes be manipulated? These are just a few of many questions that are yet to be addressed by researchers. I propose that applying cognitive theories to social phenomena and testing them under experimental conditions across various groups offer a promising approach to finding the answers in the fast-developing field of social cognition.

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Summary in Dutch

Theoretisch kader en samenvatting van empirische studies

Ik begon mijn onderzoek met het idee om een plausibel cognitief theoretisch kader te vinden voor één sociaal fenomeen: conformerend gedrag. Naar mijn mening was de Theory of Event Coding (TEC) de cognitieve theorie die een goede basis zou kunnen bieden voor het bouwen van dit raamwerk. Om mijn idee te testen, voerde ik een experiment uit met een bestaand onderzoeksontwerp dat was overgenomen uit eerdere onderzoeken naar conformiteit (Klucharev, Hytönen, Rijpkema, Smidts, & Fernández, 2009; Shestakova et al., 2012). In mijn studie voegde ik echter nog een experimentele conditie toe, namelijk een niet-sociale groep waar deelnemers niet werden geconfronteerd met wat zij dachten dat de alternatieve keuzes van andere studenten waren, maar met willekeurige computerkeuzes, waardoor de 'sociale' factor werd geëlimineerd en deze hun conformiteit niet beïnvloedde. Volgens TEC zou een simpele confrontatie met alternatief gedrag in een later stadium de reproductie van je eigen gedrag beïnvloeden (Hommel, Colzato & van den Wildenberg, 2009; Hommel, 2009). De onderzoeksresultaten ondersteunden mijn theorie. Helaas had het onderzoeksparadigma dat ik gebruikte voor mijn eerste experimenten een statistisch probleem: de resultaten werden mogelijk beïnvloed door regressie naar het gemiddelde dat zou kunnen zijn opgetreden als gevolg van het beoordelingssysteem (schaal 1 tot 8) dat werd gebruikt in de 1e en de 2e experimentele sessies (Ihmels & Ache, 2018; Kim & Hommel, 2018). Dat betekende echter niet dat mijn theorie fout was. Ik geloofde nog steeds dat TEC een goede theoretische basis kon bieden voor het bestuderen van conformiteit en mogelijk andere sociale fenomenen. Ik moest echter een nieuw onderzoeksontwerp maken waarmee ik mijn theorie kon testen en de statistische problemen van de vorige kon vermijden. Zoals ik hierboven vermeldde, werd het probleem veroorzaakt door het beoordelingssysteem dat in dit paradigma wordt gebruikt: een 8-puntsschaal variërend van 1 (zeer onaantrekkelijk) tot 8 (zeer aantrekkelijk). Dus besloot ik deze beoordeling te vervangen door een "keuze tussen twee foto's" -procedure. In plaats van één foto te beoordelen, werd de deelnemers gevraagd om de foto te kiezen die ze het leukst vonden van de twee foto's. Deze onderzoeksopzet elimineert elke mogelijkheid van regressie naar het gemiddelde. Tegelijkertijd wilde ik in mijn vervolgonderzoek kijken of en hoe conformiteit beïnvloed werd door cultuur; in het bijzonder collectivistische versus individualistische cultuur. Mijn idee was dat mensen uit meer individualistische culturen beter zijn in het scheiden van 'ik' van 'anderen' en daardoor minder vatbaar zijn voor het conformiteitseffect. Dat vereiste weer een wijziging in de onderzoeksopzet: ik verving foto's van blanke vrouwen door foto's van planten en bloemen (meer cultureel neutrale prikkels). Dit onderzoek is deels in het lab uitgevoerd (in Nederland en China) en deels online (in de

VS en India). Ik heb geprobeerd het onderzoeksontwerp voor alle experimentele groepen zo gelijk mogelijk te houden. De resultaten van deze studie bevestigden mijn aanvankelijke hypothese: het conformiteitseffect verschilde niet tussen alle experimentele groepen, ongeacht het land of de toestand (sociaal versus niet-sociaal), wat suggereert dat mensen gevoelig zijn voor tussenkomende gebeurtenissen die prikkels associëren met te beoordelen factoren, maar de sociale aard van deze tussenkomende gebeurtenissen is niet relevant. Ik kon geen significant interactie-effect tussen cultuur en conformiteitsniveau vinden, hoewel er een tendens was naar meer conformiteit onder de deelnemers uit collectivistische culturen (met name China) onder sociale omstandigheden, wat verschillende dingen zou kunnen betekenen:

- het is mogelijk dat het cultuureffect en de interactie tussen cultuur en experimentele conditie erg klein en moeilijk te detecteren is, daarom zou er een veel grotere steekproef nodig zijn om het te vinden;
- conformiteit wordt niet beïnvloed door cultuur en manifesteert zich gelijkmatig in verschillende samenlevingen;
- het verschil tussen individualistische en collectivistische culturen wordt tegenwoordig minder uitgesproken.

Hoewel mijn hypothese bepaalde veranderingen heeft ondergaan als gevolg van de experimenten die ik heb uitgevoerd om het te testen, ondersteunt de eindconclusie naar mijn mening het oorspronkelijke idee: TEC is een plausibele cognitieve theorie die conformiteit onder verschillende omstandigheden kan verklaren en voorspellen. In hoofdstuk 5 heb ik kritisch gekeken naar de moderne benadering van sociale cognitie en naar de methodologieën die in de huidige onderzoeken naar conformiteit in het algemeen en op het gebied van sociale cognitie in bredere zin worden toegepast. Cognitieve theorieën die worden toegepast om sociale fenomenen te verklaren, kunnen en moeten niet alleen sociale fenomenen beschrijven vanuit een cognitief perspectief in termen van theorieën, maar eerder gedrag onder verschillende omstandigheden verklaren en voorspellen.

Curriculum Vitae

Diana Aleksandrovna Kim was born on January 25, 1969 in Moscow, Russia. In 1986 she graduated from high school in Moscow and in 1991 obtained her University degree at the Moscow Linguistic University majoring in English. In the period between 1991 and 1994 Diana worked as a personal assistant at the office of A.E.C. (Dutch trade company operating in Russia) and after as a producer at the Moscow news office of RTL4 (Dutch TV station). In 1994 Diana moved to the Netherlands and worked at various business companies as a personal assistant and later as a vendor manager (at the Amsterdam office of Cisco Systems). Thereafter she studied Psychology at Leiden University, graduating from the Bachelor program in 20... Diana then started the Research Master's program in Psychology, Cognitive Neuroscience track at Leiden University, during which she did a research investigating the effects of neurofeedback training in elderly population. In 20.. she graduated from the Master program and immediately started a PhD at Leiden University. Under the supervision of Prof.dr. Bernhard Hommel, Diana has investigated the cognitive mechanism underlying conforming behavior. The results of her doctoral work are outlined in this dissertation.

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