

For Me or for Them: How In-Group Identification and Beliefs Influence the Comprehension of
Controversial Texts

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Abstract

This study investigated the impact of readers' prior beliefs and level of in-group identification on the comprehension of controversial texts. Psychology students from a university that is known for its specialization on psychoanalysis in clinical psychology, read two controversial texts on the issue of whether cognitive-behavioral therapy (CBT) or psychoanalysis (PA) is more effective.

Participants' beliefs and their in-group identification were assessed before reading and comprehension was assessed with a verification task. Results revealed a better comprehension of the belief-consistent text for high identifiers – regardless of whether this text was socially affirming or socially threatening. Low identifiers favoring PA exhibited weak situation models for both texts, whereas a stronger comprehension for the social-affirming text was found for low identifiers favoring CBT. These results suggest that readers' beliefs and their level of in-group identification with a relevant social group are both sources for a biased comprehension of social scientific issues.

Keywords: beliefs, cognitive dissonance, in-group identification, multiple text comprehension.

What is already known about this topic

- When confronted with conflicting information, readers have a weaker memory for belief-inconsistent compared to belief-consistent information (belief-consistency effect)
- A defensive mechanism used by readers to avoid and reduce inconsistencies and cognitive dissonance is selective exposure, which can occur on the personal level (i.e., avoiding belief-inconsistent information) and also on the social level (i.e., avoiding socially threatening information)

What this paper adds

- When a social scientific controversy affects entire groups, social factors such as social categorization and identification may affect how individuals deal with conflicting texts
- The present study investigated the impact of readers' prior beliefs and their identification with a social group on the comprehension of two controversial texts on a social scientific issue
- Results showed that the belief-consistency effect as a consequence of a belief protection mechanism (i.e., selectively exposing oneself to belief-consistent information) is stronger than the need to avoid socially threatening information for high identifiers

Implications for theory, policy or practice

- Defensive-motivated readers are problematic for the communication of social scientific issues
- Defense motivation seems to be driven by both readers' beliefs and their level of in-group identification with a relevant social group that shares or does not share the same belief
- Based on our results, elaborative processing of contra arguments might be fostered by highlighting social groups with which readers have only moderate identification but that are nonetheless relevant for them

For Me or for Them: How In-Group Identification and Beliefs Influence the Comprehension of Controversial Texts

The World Wide Web offers readers large amounts of information and serves as a central information source about various social scientific issues. When readers attend to information on social scientific topics, they frequently encounter conflicting texts that present one-sided arguments supporting the respective author's argumentative stance. Even if it is desirable that readers attend to conflicting information in an impartial manner, cognitive capacities are limited and readers prefer belief-consistent over belief-inconsistent information in media selection and during comprehension. For example, when confronted with conflicting information, readers have a weaker memory for belief-inconsistent compared to belief-consistent information (*text-belief consistency effect*; e.g., Eagly & Chaiken, 1993; Maier & Richter, 2013a, 2014; Wiley, 2005). This is particularly true for topics that are self-relevant such as vaccinations (e.g., Maier & Richter, 2013a). Notably, most of the research on belief effects has focused on the influence of individually held beliefs on information selection, processing, and memory. However, social scientific issues are often not only relevant for the individual but also for the wider social groups to which individuals belong or with which they identify. When a controversy affects entire groups, social factors such as social categorization and identification may affect how individuals deal with conflicting texts (de Hoog, 2013). For example, people who strongly identify with the social category of "gamers" tend to devalue scientific information on the harmful effects of playing violent video games (Nauroth, Gollwitzer, Bender & Rothermund, 2014). Likewise, the extent to which a particular psychotherapy approach is favored (e.g., cognitive behavioral therapy [CBT] vs. psychoanalysis [PA]) might depend on identification with a social group that endorses either pro-CBT or pro-PA beliefs—especially if one already subscribes to the respective belief. In the present study, we investigated how situationally salient social identities influence the memory representation of conflicting texts. Before deriving predictions of how a salient social identity influences the mental representation of

conflicting texts, we discuss the influence of prior beliefs on text comprehension. We present the research on belief and social identity effects on comprehension within the context of cognitive dissonance theory.

Comprehension and Beliefs

A number of studies have investigated the specific effects that prior beliefs exert on the selection, processing, and comprehension of belief-consistent and belief-inconsistent information. Many of these studies found a confirmation or congeniality bias in information selection, because readers prefer to select belief-consistent rather than belief-inconsistent information (e.g., Hart, Albarracin, Eagly, Brechan, Lindberg, & Merrill, 2009; Knobloch-Westerwick & Meng, 2011). Moreover, belief-consistent information is also preferred over belief-inconsistent information in the comprehension and the memory for conflicting information (e.g., Chinn & Brewer, 1993; Johnson & Seifert, 1994; Kardash & Scholes, 1995; Levine & Murphy, 1943; Maier & Richter, 2013a, 2014; Ross, Lepper, & Hubbard, 1975; Wiley, 2005). Levine and Murphy (1943) conducted one of the first studies demonstrating a superior recall of belief-consistent information. Participants holding either pro- or anti-communist views had a better memory for belief-consistent arguments after reading pro- and anti-communist messages. A similar pattern of results, that is, a stronger mental representation for belief-consistent information has also been found in the comprehension of conflicting multiple texts (e.g., Maier & Richter, 2013a; for a review, see Richter & Maier, 2017). This line of research suggests that readers' comprehension of conflicting information is biased by prior beliefs and that readers often hold to their beliefs rather than make accurate or unbiased decisions (for a review, see Eagly & Chaiken, 1993).

One possible explanation for these biases is that readers have a core motive for cognitive consistency (Gawronski, 2012; Festinger, 1957). If cognitive consistency is threatened by belief-inconsistent information, cognitive dissonance arises as an aversive state that individuals are motivated to reduce (Festinger, 1957). In other words, inconsistencies caused by an exposition to

belief-inconsistent information are bothersome for readers, prompting them to work toward reducing those inconsistencies (Festinger, 1957; Harmon-Jones, Amodio, & Harmon-Jones, 2010). A defensive mechanism used by readers to reduce inconsistencies and cognitive dissonance is selective exposure, which means that belief-inconsistent information is more likely to be ignored and avoided (Hart et al., 2009; Jonas et al., 2014; Knobloch-Westerwick & Meng, 2011). A specific form of selective exposure seems to occur not only when readers decide which text they should read but also during processing and comprehension of texts that communicate belief-relevant information. Using eye-tracking to investigate the processing of belief-relevant controversial texts, Maier, Richter and Britt (2016) found that readers notice the belief-consistency of an argument during initial reading (as indicated by longer first-pass rereading times for belief-inconsistent sentences). Still, readers often do not invest the necessary effort to strategically resolve the inconsistencies but avoid information processing that might challenge a reader's point of view (such strategic processing would be indicated, for example, by more and longer look-backs to previous text regions) This type of processing can be viewed as a belief-protection mechanism (McCrudden & Sparks, 2014). It is important to note that in the eye-tracking study by Maier et al. (2016), fewer look-backs to previous text regions after reading belief-inconsistent information were associated with one-sided comprehension, that is, a good mental model for belief-consistent arguments but a weak mental model for belief-inconsistent arguments.

Social Self and Cognitive Dissonance

Group memberships contribute to the self-concept, implying that cognitive dissonance may also occur on the social level (Festinger, 1957). Social identity theory proposes that the perception of the personal self and the membership in social groups are important sources for the self-concept (Tajfel & Turner, 1986). When group membership or social identity becomes salient in a given situation, the in-group and the norms and values associated with the in-group guide the thoughts and behavior of individuals (Terry & Hogg, 1996). The strength of the group's influence is

determined by the level of in-group identification, that is, the degree to which individuals perceive themselves as group members (Ellemers, Spears, & Doosje, 2002) and the degree to which the in-group is incorporated into the self (Tropp & Wright, 2001). In general, the level of in-group identification can vary between members of a social group (Ellemers et al., 2002). If in-group identification is high, individuals perceive themselves more as group members.

Often, personal identity and social identity are confounded given that both contribute to the goal of maintaining a coherent self (Sherman & Cohen, 2006). In such situations, belief-inconsistent information on social scientific issues can pose a threat to social identity (Branscombe, Ellemers, Spears, & Doosje, 1999) and readers may also use a defensive motivation mechanism to social identity threats (de Hoog, 2013), especially those readers who strongly identify with the group (de Hoog, 2013). Thus, if belief-inconsistent information is socially threatening and belief-consistent information is socially affirming, readers will likely selectively expose themselves to belief-consistent and socially affirming information and will avoid processing belief-inconsistent and socially threatening information.

However, circumstances exist in which readers' personal prior beliefs differ from the position of the social group on an issue that is relevant to the social self. Individuals experience cognitive dissonance when they become aware that other in-group members hold beliefs that are opposed to their own beliefs (Matz & Wood, 2005). Matz and Wood (2005, Study 1) found that cognitive dissonance occurred when participants were merely informed that in-group members had divergent views but interaction with these group members was not expected. Hence, intragroup dissonance arises when the beliefs and values of an in-group are inconsistent with one's own beliefs or values (see also Cooper & Stone, 2000). When readers are exposed to belief-relevant information about social scientific issues, intragroup dissonance should occur when a reader's argumentative stance is inconsistent with the argumentative stance valued by the reader's in-group.

Festinger (1957) reasoned that intragroup dissonance can be resolved by different

mechanisms. For example, the person can change their beliefs or convince others to change their beliefs. These different dissonance-reduction strategies are likely associated with different foci on conflicting texts. Readers might focus on belief-consistent information with the purpose of protecting their beliefs and possibly collecting information to change the beliefs of others, or they might focus on information that affirms the beliefs of the group, which might include changing their own beliefs.

Rationale and Overview

Research indicates that readers' individual prior beliefs have a large impact on their comprehension of controversial information on social scientific issues. Moreover, social scientific controversies are often relevant for social groups to which individuals belong and identification with the group is likely to additionally influence comprehension. Based on the direction of readers' beliefs and socially shared beliefs, controversial information can be either consistent or inconsistent with a reader's beliefs and socially affirming or socially threatening. Given the dearth of research on the interactive effects of beliefs and salient social identities, we investigated how students of psychology comprehend conflicting texts on an identity-relevant issue, i.e. whether cognitive-behavioral therapy (CBT) or psychoanalytic (PA) treatment is more effective. On a personal level, the arguments and empirical results can be more or less consistent with students' beliefs about psychotherapy and the effectiveness of CBT over PA. Moreover, the debate is also important for the social group of psychology students as it defines the distinctiveness of one group of prospective psychological practitioners via the specialization of a university's psychology program. For example, the university where the data for the present study were collected (University of Kassel) is characterized by its specialization on psychoanalysis in clinical psychology. This specialization is a relevant aspect of the definition of the social group of "Kassel psychology students".

To test this assumption, a pilot study was conducted with an independent sample of 49 psychology students from the target university (44 females, 5 males; age: $M = 23.98$, $SD = 4.70$).

Participants responded to three items on a scale from 1 = *totally disagree* to 6 = *totally agree*, indicating the extent to which they endorsed the beliefs that their university's psychology program is characterized by PA (e.g., "The psychology program in Kassel is characterized by its focus on psychoanalysis.", Cronbach's $\alpha = .84$) or CBT (e.g., "The focus of the psychology program in Kassel is on cognitive behavioral therapy.", Cronbach's $\alpha = .86$). As expected, a paired sample t test revealed a stronger endorsement of the belief that the psychology program focuses on PA ($M = 3.37$, $SD = 1.18$) compared with CBT ($M = 2.33$, $SD = 0.84$), $t(48) = 5.76$, $p < .05$, $d = 1.00$. A nonsignificant correlation ($r < .20$) was found between the difference score of perceived specialization (focus on PA – focus on CBT) and participants' identification with the group of "Kassel psychology students" (assessed with the item "I identify with the group "Kassel psychology students", see Postmes, Haslam, & Jans, 2013; response categories ranging from 1 = *totally disagree* to 6 = *totally agree*). This finding indicates that the perception of the specialization or group characteristic was largely independent of the level of in-group identification.

To investigate the extent that beliefs and relevant social identities influence comprehension and memory of controversial texts, participants' prior beliefs and their in-group identification were independently assessed at the beginning of the experiment. Participants then read one text arguing that psychoanalysis is more effective than cognitive behavioral therapy (pro-PA text) and a second text that argued that cognitive behavioral therapy is more effective than psychoanalysis (pro-CBT text). After reading both texts (reading order was counterbalanced between participants), participants' referential representation of the text content (situation model; Kintsch, 1988) was assessed with a verification task.

We expected that the representation of the content of the two texts should differ as a function of readers' prior beliefs and their level of in-group identification. More precisely, we hypothesized that the situation model for the belief-consistent text (i.e., the text arguing for the superior effectiveness of CBT over PA when the respective reader holds pro-CBT beliefs and vice

versa) is better compared to the belief-inconsistent text (i.e., the text arguing for the superior effectiveness of CBT over PA when the respective reader holds a pro-PA belief). This text-belief consistency effect has been demonstrated already in previous research (e.g., Maier & Richter, 2013a; for a review, see Richter & Maier, 2017), but the present research advances the literature by testing the additional hypothesis that for social scientific issues relevant for social groups the belief effects depend on readers' identification with their group and the beliefs held by the group. The social group's (Kassel psychology students) specialization on psychoanalysis implies that the pro-CBT text provides belief-inconsistent and socially threatening information for participants favoring PA, whereas the pro-PA text provides group-affirming and belief-consistent information for such participants. Based on that, we hypothesized that the situation model for the pro-PA text is stronger compared to the situation model for the pro-CBT text when (a) the reader holds pro-PA beliefs and (b) the reader highly identifies with the social group. In turn, we hypothesized that the situation model representation for the pro-CBT text is weaker under the same circumstances. In other words, when readers hold pro-PA beliefs, their identification with the social group should amplify the text comprehension advantage for the belief-consistent pro-PA text over the belief-inconsistent pro-CBT text.

In contrast, participants holding pro-CBT beliefs should experience intragroup dissonance, because their position on an issue of relevance to the group is divergent with the position valued by the group (Matz & Wood, 2005). In this situation, the pro-PA text is inconsistent with readers' beliefs, and the pro-CBT text is belief-consistent. The intragroup dissonance resulting from being confronted with a pro-PA text should be particularly emphasized for those who strongly identify with the social group. Two different dissonance reduction strategies seem possible for high identifiers that favor the pro-CBT text (see Festinger, 1957). Either they might use a defensive mechanism protecting their beliefs by paying more attention to the belief-consistent text, or they might use a defensive mechanism protecting the social group by paying more attention to socially

affirming information. We expected no intragroup dissonance to occur for low identifiers who hold pro-CBT beliefs. Instead, we expected that these participants might be more open-minded and curious about the view shared by the social group compared to high identifiers as they should not experience a social threat. In sum, this should lead to a better comprehension of the pro-PA text over the pro-CBT text.

Method

Participants

Forty-five psychology students (38 women and 7 men) from the University of Kassel (Germany) participated in the study. Participants' average age was 23.87 years ($SD = 3.78$). Most of them were second-year students (i.e., the average number of their current semester was 3.20, $SD = 1.78$), and they received 11 Euros for participating.

Text material

The experimental text material consisted of two texts that discussed research on the efficacy of two types of psychotherapy. The *psychoanalysis text* (pro-PA text) argued in favor of the effectiveness of psychoanalysis and against the use of cognitive behavioral therapy. Likewise, the *cognitive behavioral therapy text* (pro-CBT text) argued that cognitive behavioral therapy is more effective than psychoanalysis. The texts followed the same rhetorical structure. The first paragraph was the introduction, the 2nd to 5th paragraph included four unique claim-first arguments separated by sub headlines, and the 6th paragraph was the conclusion. The texts were also of similar readability (determined with the German adaption of the Flesch's Reading Ease Index, Amstad, 1978; see Table 1). The texts were pilot-tested with an independent sample of psychology students ($N = 25$). Participants rated the texts with regard to understandability, plausibility, interest, number of arguments and perceived argumentative stance. Paired-samples t tests (with Holm-Bonferroni correction for multiple tests, Holm, 1979) revealed only a significant difference in the ratings of the perceived argumentative stance between the texts, $t(24) = 43.70$, $p < .001$. No differences in other

aspects (understandability, plausibility, interest, and number of arguments; see Table 1) were observed.

Comprehension measure

Readers' comprehension of each text was assessed with a verification task (adapted from Schmalhofer & Glavanov, 1986) in which participants judged for paraphrases, inferences, and distractors (eight items per item type and text) whether or not they matched the situation described by the texts.¹ Paraphrased items provided statements that matched the content of sentences from the texts. To construct paraphrase items, original sentences from the texts were modified by changing the word order and replacing the key content word with synonyms. Inference items were statements that were not explicitly provided by the texts, but were necessary and valid conclusions that participants needed to draw to build an adequate situation model of the text. Distractor items were additional statements about research on the efficacy of psychotherapy. Information presented in the distractor items was not explicitly mentioned in the text nor could this information be inferred from the text's content. Comprehension scores on the level of the situation model were corrected for response tendencies by relating the amount of yes responses to distractor items (false alarms) to the amount of yes responses to inference items (hits). To this end, the probit-transformed proportions of the yes responses to distractor items were subtracted from the probit-transformed proportions of yes responses to inference items (for details, see Maier & Richter, 2014).

Reader Characteristics

Direction of prior beliefs. We used 10 statements (response categories ranging from 1 = *totally disagree* to 6 = *totally agree*) to assess the extent to which participants held pro-PA versus pro-CBT beliefs. Participants' agreement with the pro-PA text was assessed with five statements (e.g., "I think that psychoanalysis is the more effective form of psychotherapy", Cronbach's $\alpha = .90$). Likewise, participants' agreement with the pro-CBT text was assessed with five statements (e.g., "I think that cognitive behavioral therapy is the most effective form out of all forms of

psychotherapy”, Cronbach’s $\alpha = .84$). We computed the mean difference between the two beliefs (mean agreement to psychoanalysis belief scale – mean agreement to cognitive behavioral therapy belief scale), with higher positive scores indicating stronger pro-PA over pro-CBT beliefs and higher negative scores indicating stronger pro-CBT over pro-PA beliefs.

In-group identification. Participants’ identification with the “Kassel psychology students” group was assessed with the in-group identification scale from Leach et al. (2008). The scale consists of 14 statements (e.g., “I feel committed to psychology students in Kassel”, response categories ranging from 1 = *totally disagree* to 6 = *totally agree*) assessing in-group identification on five components (solidarity, satisfaction, centrality, individual self-stereotyping, and in-group homogeneity; for details see Leach et al., 2008). In the present sample, the in-group identification scale reached a good internal consistency (Cronbach’s $\alpha = .85$).

Procedure

At the beginning of the computer-based experiment proper, participants received information about plans of the German Federal Ministry of Health to restructure the Bachelor/Master psychology programs at German universities. These plans focus on a new law regulating the licensing of psychotherapists in Germany and changing the clinical psychology/psychotherapy modules in the Bachelor/Master. The information further explained that the restructuring plans would address the controversial question of psychotherapy effectiveness and that the main therapeutic schools—PA and CBT—have a continuing disagreement about their proven efficacy. The instruction informed participants that they will read one text presenting arguments in favor of PA and one text presenting arguments in favor of CBT.

After the introduction to the controversial topic, participants’ prior beliefs and their level of in-group identification were assessed. In the instruction of the in-group identification scale, participants were reminded that the clinical psychology program at the University of Kassel is characterized by a strong focus on PA. Participants then read the two controversial texts in a self-

paced fashion. After reading, participants worked on the verification task. In this task, participants read test items one at a time in black letters (font type Arial, average height 0.56 cm, bold) on a white background and in random order) and provided their judgments to the question “Does the statement match the situation that was described in the texts?” by pressing one of two response keys (marked green for *yes* and red for *no*). At the end of the experiment, participants were thanked and debriefed.

Design

The experimental design was a one factorial within-subjects design (*text type*: pro-PA vs. pro-CBT text). Belief-consistency was varied within subjects to ensure sufficient power and to control for individual differences between participants related to reading comprehension, such as reading skills, belief direction and strength, topic interest or working memory capacity. Participants’ prior beliefs as well as participants’ in-group identification were included as continuous independent variables. Importantly, the correlation between prior beliefs and in-group identification was only moderate ($r = .40, p < .05$), making it possible to scrutinize the prior beliefs \times identification interaction effect. In addition, *text order* (pro-PA vs. pro-CBT text first) was counterbalanced between participants and included as a control factor.

Results

We tested our hypotheses using an ANCOVA with the two dependent variables (i.e., comprehension of the two text types) as within-subjects factor and the individual difference variables prior beliefs and in-group identification as continuous between-subjects variables (z standardized) which allowed a simultaneous test of the within-and between-subjects effects (Cohen, Cohen, West, & Aiken, 2003). The reading order of the texts was included as a control factor in the analysis. The main hypothesis that comprehension of the two texts should differ as a function of participants’ prior beliefs and their in-group identification implies a three-way interaction effect (i.e., prior beliefs \times in-group identification \times text type). Differences between

participants holding pro-PA and those holding pro-CBT beliefs were tested at conditional values one standard deviation above and below the mean of in-group identification in two separate moderated regression models for the comprehension of the two text types (i.e., pro-PA vs. pro-CBT text) as the dependent variables (cf. Cohen et al., 2003). Hypothesis tests were based on Type I error probability of .05 (two-tailed), but we used one-tailed testing for directional hypotheses where applicable. Descriptive statistics and intercorrelations of all variables are provided in Table 2.

Data Cleaning

The procedure used to analyze the data is a generalization of ANOVA and (moderated) regression analysis, which might be influenced by outliers or violations of the assumptions underlying regression analysis (cf. Cohen et al., 2003). We computed Cook's D (Cook, 1977) as an indicator of the combined effect of leverage (extremity on the independent variables) and discrepancy (extremity on dependent variables). This procedure can be viewed as a global measure of influence of a specific data point on the results of the analyses. Cook's D for each case can take only positive values (minimum: 0) with higher values indicating a larger influence on the results. Following the suggestions of Cohen et al., the cut-off value was set to 1.0. In addition, we also investigated $DFBETAS_{ij}$ as a local measure of influence, that is, the influence on specific regression coefficients. Higher values again indicate a larger influence. The cut-off value was set to $DFBETAS_{ij} > \pm 1$ according to Cohen et al. Three data points exceeded the critical values for Cook's D or $DFBETAS_{ij}$ and were not included in the analyses. We also investigated whether the assumptions of linearity, normally distributed residuals, and homoscedasticity were met in the remaining data set. The distributions of the residuals of all dependent variables did not differ significantly from a normal distribution (Kolomogorov-Smirnov tests: $Z \leq 1.00$, $p > .27$). Moreover, graphical displays (i.e., scatterplots) of residuals revealed no evidence that the normality, linearity, and homoscedasticity assumptions were violated.

Direction of Beliefs

A paired-samples *t* test for participants' agreement with the two belief scales revealed no clear preference for either psychoanalysis ($M = 3.30$, $SD = 0.94$) or cognitive behavioral therapy ($M = 3.30$, $SD = 0.86$), $t(41) = 0.03$, *n.s.* Twenty participants (48%) favored cognitive behavioral therapy, 17 (40%) favored psychoanalysis, and 5 (12 %) reported no preference for either argumentative side in the controversy. The difference score of the two belief scales (mean agreement of psychoanalysis belief scale – mean agreement of cognitive behavioral therapy belief scale) ranged from -2.20 to 3.20 ($M = 0.00$, $SD = 1.25$).

Comprehension Outcome

The ANCOVA revealed a three-way interaction of text type, prior beliefs, and in-group identification, $F(1, 37) = 4.85$, $p < .05$, $\eta^2 = .10$. Conditional effects of text type were computed for participants holding pro-PA beliefs (1 *SD* above the mean of the difference variable prior beliefs) and for participants holding pro-CBT beliefs (1 *SD* below the mean of the difference variable prior beliefs) at high (1 *SD* above the mean of in-group identification) and low (1 *SD* below the mean of in-group identification) values of the moderating variable in-group identification to interpret the three-way interaction (Aiken & West, 1991). Based on mean differences at these points, one-tailed paired-sample *t* tests were conducted to examine the interaction. Participants who were highly identified with the “Kassel psychology students” group and held pro-PA beliefs had a stronger situation model of the pro-PA text ($M = 2.14$, $SE_M = 0.26$) compared to the pro-CBT text ($M = 1.60$, $SE_M = 0.26$), $t(37) = 1.93$, $p < .05$, $d = 0.33$. Likewise, participants who were highly identified with the group but held pro-CBT beliefs had a stronger situation model of the pro-CBT text ($M = 1.71$, $SE_M = 0.37$) compared to the pro-PA text ($M = 0.96$, $SE_M = 0.36$), $t(37) = 1.90$, $p < .05$, $d = 0.33$. Thus, participants with a high level of in-group identification showed a text-belief consistency effect (Figure 1). In contrast, lowly identified students who held pro-PA beliefs had similar and overall weak situation models for the two text types (pro-PA text: $M = 1.10$, $SE_M = 0.49$; pro-CBT text: $M = 1.14$, $SE_M = 0.50$; $t(37) = 0.09$, *n.s.*). Lowly identified students who held pro-CBT beliefs

had a stronger situation model of the pro-PA text ($M = 2.42$, $SE_M = 0.26$) compared to the pro-CBT text ($M = 1.68$, $SE_M = 0.26$), $t(37) = 2.64$, $p < .05$, $d = 0.45$.

In addition, the ANCOVA revealed an interaction of text type and reading order, $F(1, 37) = 5.34$, $p < .05$, $\eta^2 = 0.11$. Participants who had read the pro-CBT text first had a stronger situation model for the pro-PA text ($M = 1.88$, $SE_M = 0.21$) compared to the pro-CBT text ($M = 1.36$, $SE_M = 0.21$), $t(37) = 2.36$, $p < .05$, $d = 0.41$. Participants who had read the PA first had a stronger situation model for the pro-CBT text ($M = 1.70$, $SE_M = 0.25$) compared to the pro-PA text ($M = 1.44$, $SE_M = 0.25$), although this difference failed to reach significance, $t(37) = 1.00$, *n.s.*. Hence, participants had a stronger situation model for the text they had read second. No other effects of the independent variables were significant.

To further investigate the three-way interaction of text type, prior beliefs, and in-group identification, two separate moderated regression models were estimated for the comprehension of each text type (i.e., pro-PA text or pro-CBT text) as the dependent variable. The moderating variables (prior beliefs and in-group identification) were z standardized and the reading order was contrast coded ($-1 =$ pro-CBT text first, $1 =$ pro-PA text first). These variables and the interaction of the moderating variables were entered simultaneously as predictors in the models. In the regression model for the pro-PA text, there was a significant interaction effect between prior beliefs and in-group identification (see Table 3 for parameter estimates). The simple slope of in-group identification for participants holding pro-PA beliefs was positive ($B = 0.52$, $SE_B = 0.31$, $p < .05$, one-tailed), whereas it was negative for participants holding pro-CBT beliefs ($B = -0.73$, $SE_B = 0.23$, $p < .05$, one-tailed), indicating that the situation model strength of the pro-PA text increased with the level of in-group identification for participants favoring psychoanalysis but decreased with the level of in-group identification for participants favoring CBT. No significant interaction effect between prior beliefs and in-group identification for the pro-CBT text was found (see Table 3). These results are consistent with the pattern of results from the ANCOVA, that is, the difference

between the two situation models was driven by differences in the situation model strength of the pro-PA text that varied as a function of participants' prior beliefs and their in-group identification.

Discussion

The present study investigated the impact of readers' prior beliefs and their identification with a social group on the comprehension of two controversial texts. The results revealed a strong belief-consistency effect in the memory representation for controversial texts for high identifiers – regardless of whether the belief-consistent text provided socially affirming or socially threatening information. For high identifiers holding pro-PA beliefs, belief-consistent information also affirms the social self and belief-inconsistent information is also a threat to social identity (cf. Branscombe et al., 1999). Accordingly, the belief-consistency effect for high identifiers holding pro-PA beliefs likely results from a cognitive dissonance experience at the level of the individual and social self. As suggested by research on selective exposure, belief-inconsistent information can trigger a defensive motivation mechanism (Festinger, 1957) during which strategic processing of belief-inconsistent information is avoided (Maier et al., 2016). This effect is further pronounced, because the processing of socially threatening information also elicits a defense motivation process (de Hoog, 2013). Thus, the results for high-identifiers that favor PA are consonant with research on belief effects and social threats. In addition, we are able to extend this line of research with the results for high identifiers holding pro-CBT beliefs. The belief-consistency effect that we found in the memory representation of these participants cannot be interpreted as resulting from socially and individually threatening information. Instead, such participants were presented with belief-consistent but socially threatening and belief-inconsistent but socially affirming information during comprehension. We suppose that for high identifiers favoring CBT, the belief-consistency effect is due to a belief protection mechanism (i.e., selectively exposing oneself to belief-consistent information) that is stronger than the need to avoid socially threatening information. Put differently, the pattern of results might indicate that readers' defensive motivation mechanism

against threats to the individual self has priority compared to defensive motivation mechanism against threats to the social self when social and individual beliefs are divergent.

The finding that the effects for the memory representation were due to different situation model strengths in the socially affirming text (i.e., pro-PA text) further supports this conclusion. The situation model strength of the pro-PA text increased with the level of in-group identification for participants favoring PA, but decreased with the level of in-group identification for participants holding pro-CBT beliefs. In contrast, comprehension of the pro-CBT did not depend on the level of in-group identification. This difference in results implies that participants in our study were aware that the arguments presented in pro-PA text are more relevant for the “Kassel psychology students” social group, because these arguments are crucial for the self-definition of the group. Hence, the positive relationship between in-group identification and situation model strength of the pro-PA text for participants favoring PA might be caused by a preference for group affirming information (de Hoog, 2013), whereas the negative relationship between in-group identification and situation model strength of the pro-PA text for participants preferring CBT might be influenced by the experience of intragroup dissonance (Matz & Wood, 2005). Moreover, the latter might be motivated not only to protect their own beliefs but to also collect information with the purpose of changing the beliefs of other group members (Festinger, 1957).

We found rather weak situation models for both text types among low identifiers favoring psychoanalysis. This finding can be interpreted as a lack of motivation to cognitively engage in text comprehension. Focusing especially on socially affirming information or engaging in text processing because of the unimportance of the social group is not attractive for these low identifiers. Conversely, low identifiers favoring CBT had a superior situation model for the socially affirming pro-PA text. We think that such participants experienced neither a social threat nor a cognitive dissonance, because low identification with the group makes the group’s preference for psychoanalysis less important to the individual. Instead, these readers might simply be interested in

learning more about the psychotherapy school that is valued at their university. Put differently, such participants are probably more open-minded and curious about the view shared by the social group.

One possible cause of the disadvantage of belief-inconsistent information in comprehension is that readers routinely use their prior knowledge and beliefs to validate the plausibility of text information as an integral part of text comprehension (epistemic monitoring; e.g., Isberner & Richter, 2014; Richter & Maier, 2017; Richter, Schroeder & Wöhrmann, 2009). The construction of a situation model is associated with epistemic monitoring processes in such a way that information judged as implausible and belief-inconsistent is often not further processed, yielding plausibility biases and text-belief consistency effects (Maier & Richter, 2013a, 2013b; Schroeder et al., 2008). Not only individually held beliefs are likely to be activated and used during epistemic monitoring processes but also socially shared beliefs. Such reasoning is consistent with theorizing by Proulx, Inzlicht, and Harmon-Jones (2012) who assumed that a general conflict monitoring mechanism exists. This general conflict monitoring mechanism detects any kind of inconsistency that results in an aversive arousal. Based on our findings, conflicts with individually held beliefs seem to be more aversive compared to conflicts with socially shared beliefs. However, we did not investigate the strategic processes that readers use during reading. Consequently, insight into the causes for comprehension differences of the two text types is limited. Further research should investigate readers' text processing more directly, for example, by using think-aloud protocols as an indicator of strategic processing (Ericsson & Simon, 1993) and reading time or eye-movements as an indicator of non-strategic and strategic processing (Just & Carpenter, 1980).

Another limitation of the present study is that we investigated identification with only one group (i.e., Kassel psychology students) and comprehension of texts about only one social scientific issue. Moreover, the study sample was rather small and the low effect sizes suggest a lack of power for the investigation of the conditional effects of text type for high/low Pro PA/CBT

believers. For a generalization of the effects, it will be important in future research to investigate whether the comprehension differences found in the present study also apply to other social groups and social scientific issues.

This study focused on the influence of readers' beliefs and their level of identification on the comprehension of controversial texts. Questions regarding the development of beliefs and identification and their dynamic interrelations during development were not pursued in this research. It would be interesting for future research to clarify if and how the origin of readers' beliefs and their group identification affect the comprehension of controversial information. For example, psychology students favoring CBT in our sample might have had more (critical) discussions with other students as their beliefs run contrary to the beliefs held by the majority of psychology students. Another limitation of our study is that its focus was on content comprehension. One additional factor that is important for multiple text comprehension is sourcing, that is paying attention to and memorizing source information (e.g., Perfetti, Rouet, & Britt, 1999). Bråten, Salmerón, and Strømsø (2016) further suggest that attending to source information is one motivated mechanism that readers can use if confronted with belief-inconsistent single texts. In detail, readers that are confronted with belief-inconsistent information are supposed to use source information to reject belief-inconsistent information rather than integrating this information in their situation model. Future research should investigate the role of sourcing in the comprehension of socially relevant belief-consistent and belief-inconsistent multiple texts.

Research from different domains has shown that readers are not motivated to achieve an accurate and unbiased position but are motivated to confirm a particular self-definitional belief. Our research extends this line of research, because it reveals insights into the interplay of readers' beliefs and their level of in-group identification with a relevant social group that shares or does not share the same belief. Defensive-motivated readers are problematic for the communication of social scientific issues. If readers are not able to assess the validity of arguments on social scientific

issues independent from their beliefs and from the beliefs shared by relevant social groups, science communication will not fully reach those individuals. Based on our results, one way to foster elaborative processing of contra arguments might be to emphasize divergent values held by social groups with which readers have only moderate identification but are nonetheless relevant for them.

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Footnote

¹ Participants' responses to the test items were analyzed to ascertain that the test items were equally plausible and that the distractor items could not be inferred by the text (for the influence of plausibility on comprehension see Schroeder, Richter & Hoever, 2008). Overall, the inference items were considered as plausible ($M = 0.59$, $SD = 0.24$). However, one inference item was perceived as highly implausible ($M = 0.13$). Moreover, one distractor item was too close to the text content as revealed by a mean response rate of 0.84 in the verification task. These two items were not considered in the analyses.

Table 1

Text Characteristics of the Experimental Texts

Text Type	Length ^a	Readability ^b	Plausibility Scale ^c <i>M (SD)</i>	Understandability Scale ^c <i>M (SD)</i>	Number of Arguments ^c <i>M (SD)</i>	Interestingness ^c <i>M (SD)</i>	Perceived Argumentative Stance ^c <i>M (SD)</i>
PA	784	35	4.05 (1.55)	4.89 (0.48)	4.04 (0.62)	4.56 (1.00)	5.96 (0.20)
CBT	759	32	4.15 (0.57)	4.79 (0.69)	3.77 (0.75)	4.04 (1.17)	1.12 (0.44)

Note. CBT: cognitive behavioral therapy, PA: psychoanalysis.

^aNumber of words per text. ^bDetermined with the German adaption of the Flesch's Reading Ease Index (Amstad, 1978). ^cResults of the pilot-testing with ratings of 25 psychology students; the plausibility scale consists of six items (Cronbach's $\alpha = .82/.80$, response categories ranging from 1 = *not at all* to 7 = *totally*) and the understandability scale consists of nine items (Cronbach's $\alpha = .76/.78$, response categories ranging from 1 = *not at all* to 7 = *totally*); one item each was used to assess perceived argumentative stance (response categories ranging from 0 = *text arguing in favor of cognitive behavioral therapy* to 7 = *text arguing in favor of psychoanalysis*) and interestingness (response categories ranging from 1 = *not at all* to 7 = *totally*). Each entry represents the average judgment across all participants of the pilot-test.

Table 2:

Means, Standard Deviations and Intercorrelations of Independent Variables (Varied Between-Subjects) and Dependent Variables

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5
1 Reading order (contrast-coded, -1 = pro-CBT text first, 1 = pro-PA text first)	0.05	1.01	1				
2 Direction of beliefs (difference score PA-CBT)	-0.05	1.25	.04	1			
3 In-group identification	3.67	1.01	-.12	.40*	1		
4 Situation model strength (pro-PA text)	1.89	0.98	.01	-.01	-.20	1	
5 Situation model strength (pro-CBT text)	1.58	0.91	.21	-.10	.02	.38*	1

Note. $N = 42$. CBT: Cognitive behavioral therapy, PA: Psychoanalysis. Direction of beliefs: Mean agreement to PA belief scale – mean agreement to CBT belief scale. Situation model strength: Biased-corrected proportion of yes-responses to inference items.

* $p < .05$ (two-tailed).

Table 3:

Parameter Estimates for Moderated Regression Analyses with Comprehension as Outcome

	Pro-PA Text		Pro-CBT Text	
	<i>Estimate</i>	<i>SE</i>	<i>Estimate</i>	<i>SE</i>
Intercept	1.66***	0.16	1.53***	0.16
Direction of beliefs	-0.04	0.16	-0.16	0.16
In-group identification	-0.10	0.16	0.12	0.17
Direction of belief X in-group identification	0.63**	0.22	0.11	0.22
Reading order	-0.22	0.16	0.17	0.16
Goodness of fit	$R^2 = .22, F(4,37) = 2.62, p = .05$		$R^2 = .07, F(4,37) = 0.72, n.s.$	

Note. Direction of beliefs (mean agreement to PA belief scale – mean agreement to CBT belief scale) and in-group identification (assessed with the in-group identification scale from Leach et al., 2008) were *z* standardized and the reading order was contrast coded (–1 = pro-CBT text first, 1 = pro-PA text first).

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed).

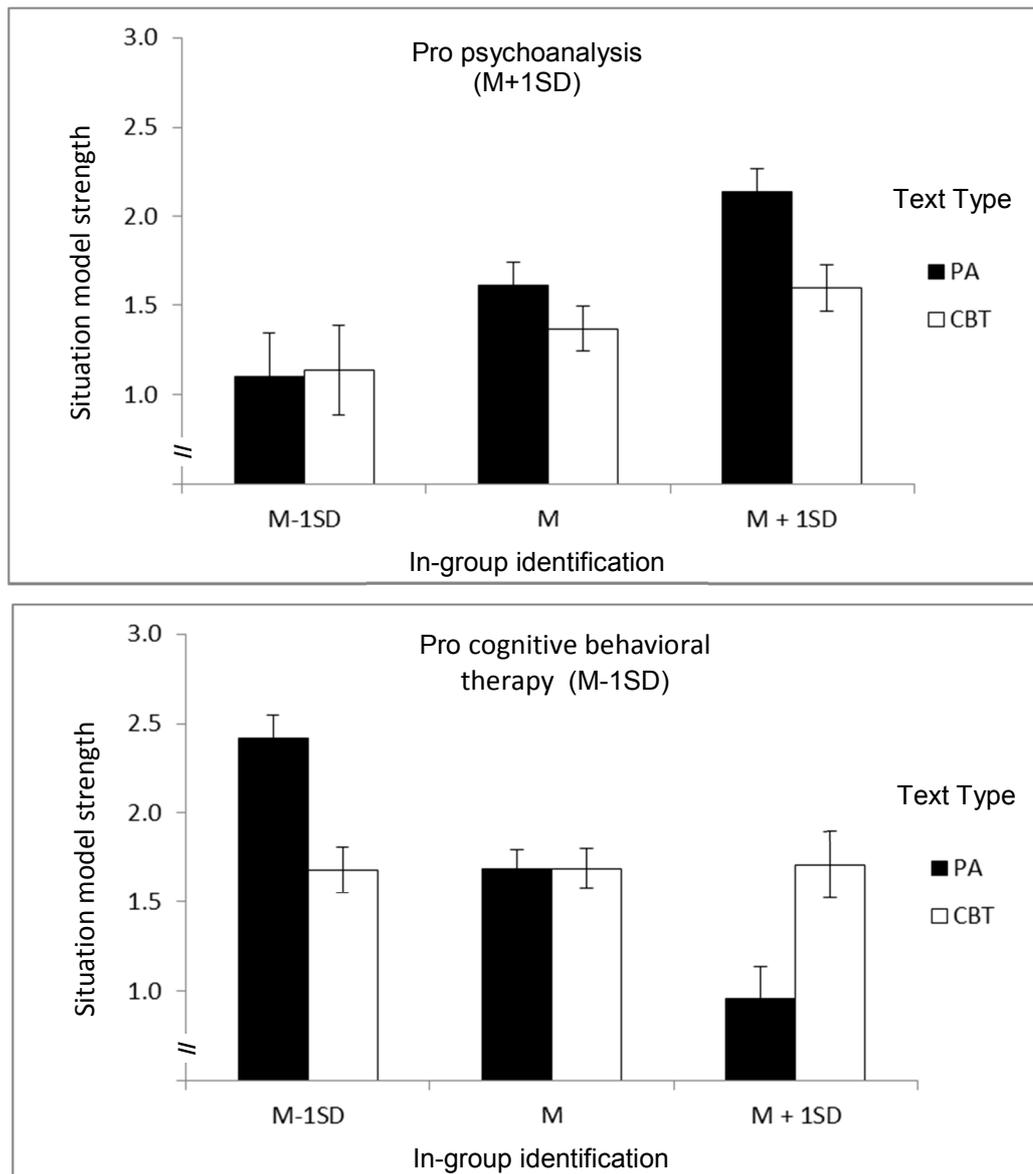


Figure 1. Interaction of the belief direction, in-group identification, and text type (PA: Psychoanalysis text, CBT: Cognitive behavioral therapy text). The effects of text type were estimated separately for participants favoring psychoanalysis (1 *SD* above the mean of the direction of beliefs) and participants favoring cognitive behavioral therapy (1 *SD* below the mean of the direction of beliefs) and at conditional values of 1 *SD* above (high level) and 1 *SD* below (low level) the mean of in-group identification. Error bars represent the standard error of the mean.