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Biased Memory Retrieval in the Service of Shared Reality With an Audience: The Role of Cognitive Accessibility

Ullrich Wagner[1], E. Tory Higgins[2], Nikolai Axmacher[3], and Gerald Echterhoff[1]
[1] Department of Psychology, University of Münster
[2] Department of Psychology, Columbia University
[3] Department of Neuropsychology, Faculty of Psychology, Institute of Cognitive Neuroscience, Ruhr University Bochum

After communicators have tuned a message about a target person's behaviors to their audience's attitude, their recall of the target's behaviors is often evaluatively consistent with their audience's attitude. This audience-congruent recall bias has been explained as the result of the communicators' creation of a shared reality with the audience, which helps communicators to achieve epistemic needs for confident judgments and knowledge. Drawing on the "Relevance Of A Representation" (ROAR) model of cognitive accessibility from motivational truth relevance, we argue that shared reality increases the accessibility of information consistent (vs. inconsistent) with the audience's attitude. We tested this prediction with a novel reaction time task in three experiments employing the saying-is-believing paradigm. Faster reactions to audience-consistent (vs. audience-inconsistent) information were found for trait information but not for behavioral information. Thus, an audience-congruent accessibility bias emerged at the level at which impressions and judgments of other persons are typically organized. Consistent with a shared-reality account, the audience-consistent accessibility bias correlated with experienced shared reality with the audience about the target person and with epistemic trust in the audience. These findings support the view that the creation of shared reality with an audience triggers a basic cognitive mechanism that facilitates the retrieval of audience-congruent (vs. audience-incongruent) trait information about a target person.

Public Significance Statement

Human memory is susceptible to various distortions and biases. An intriguing example is the subtle adaptation of a speaker's memories for past events to the audience's attitude, known as the audience-congruent recall bias, which is linked to the creation of a shared reality with the audience and the speaker's motivation to achieve a truthful view of the events. In three experiments, we investigated the underlying cognitive mechanisms. Applying a novel, speeded reaction time task, we find enhanced spontaneous cognitive accessibility of information that is supported (vs. not supported) by the shared reality with the audience. Also, cognitive accessibility predicted the subsequent recall bias. Thus, the present phenomenon can be traced to an early, nondeliberative stage of cognition. Our research shows how people's episodic memories can be altered in the course of everyday acts of social communication, and extends previous research on memory biases from self-serving motivation.

Keywords: shared reality, motivated memory bias, cognitive accessibility, communication, saying-is-believing paradigm

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Ashleigh Maxcey served as action editor.

Ullrich Wagner https://orcid.org/0000-0002-8708-8898

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Correspondence concerning this article should be addressed to Ullrich Wagner, Department of Psychology, University of Münster, Fliednerstraße 21, 48149 Münster, Germany. Email: ullrich.wagner@uni-muenster.de

The construction of memories hinges on the interplay between motivational and cognitive processes (Di Rosa et al., 2021; Eitam et al., 2013; Kunda, 1990; Sorrentino & Higgins, 1986). Research on motivational factors has largely focused on the impact of self-serving recall biases, that is, biases geared toward protecting or enhancing perceived value of the self (e.g., Conway, 2005; Sanitioso et al., 1990; Zhang et al., 2018). For example, Sedikides and colleagues found that people tend to recall information about themselves that challenges a positive self-view to a lesser degree than other information, an effect termed "mnemic neglect" (Sedikides et al., 2016). Similarly, Ross et al. (1981) showed that participants who were led to believe that a certain everyday behavior (e.g., tooth brushing) was disadvantageous rather than advantageous subsequently estimated a lower frequency of performing such undesirable behaviors within the previous 2 weeks.

While representing compelling examples of motivated memory processes, these studies have focused on self-related memories in connection with self-serving motives (self-enhancement or self-protection). A recent model by Eitam and colleagues adopts a broader view on motivated remembering that is not limited to self-related memories and extends its scope beyond value-related motives (Eitam & Higgins, 2010; Eitam et al., 2013). This model, called "Relevance Of A Representation" (ROAR), posits that the influence of motivational factors on cognition, including memory processes, is a result of the specific effects that these factors exert on the cognitive accessibility of stored information. According to ROAR, the motivational relevance of a representation determines which information becomes accessible in a perceiver's mind and is therefore most likely to be actually used in current thought (see also Higgins, 1996). Motivational sources that can increase accessibility are rooted not only in value motivation (motives related to desired outcomes), but also in truth motivation (motives related to establishing what is real) and in control motivation (motives related to managing what happens).

The ROAR model does not criticize or challenge previous accounts of motivated memory (Kunda, 1990; Sedikides et al, 2016; Zhang et al., 2018). Instead, it provides two extensions. First, it proposes a general mechanism underlying motivated cognitive biases that relates to selective enhancement of accessibility of motivation-congruent information, which is an automatic, unintentional cognitive process that emerges at early stages of information processing and does not require conscious deliberation or elaboration (De Houwer et al., 2009; Herring et al., 2013). Consistent with this view, Berry et al. (2007) found that food-deprived (vs. satiated) participants responded more quickly to food-related stimuli. This finding suggests that mnemonic accessibility of these items was enhanced in participants for whom the items were more desirable and thus had greater relevance to value motivation.

Second, ROAR proposes that such mechanisms can be driven by any relevant motive, not only by value-related motives (typically exemplified by self-serving motives). Within research on self-serving motives on self-related memories, at least two studies suggest that self-serving memory biases are associated with better accessibility of motivation-congruent information, as reflected in faster reaction times (RTs) for motivation-congruent than for motivation-incongruent information (Sanitioso et al., 1990, Study 3; Dunning et al., 1991, Study 5). However, research has not yet examined the role of truth relevance in motivated remembering and the role of the underlying cognitive mechanism of accessibility.

To address this gap, we investigated memory biases from tuning communication to an audience's judgment in the so-called "saying-is-believing" (SIB) paradigm (Higgins & Rholes, 1978). The SIB paradigm allows researchers to study a well-established memory bias that is driven by motivational truth relevance—the motivation of communicators to create shared feelings and beliefs, that is, a shared reality, with their audience (Echterhoff et al., 2005, 2009; Higgins, 1992). In the SIB paradigm, participants first read a text about the behavior of a specific target person. The text consists of several passages describing the target persons' behavior in an evaluatively ambiguous manner. For example, the behavior described in one text passage could be interpreted either as "stubborn" (more negative interpretation) or as "persistent" (more positive interpretation). After having read the text, participants are asked to describe the target person to another person (their audience) whom they believe knows the target person and either likes or dislikes this person (positive vs. negative audience attitude). Under these circumstances, participants typically produce an evaluatively more positive message for the audience if they believe that the audience likes the target and an evaluatively more negative message if they believe that the audience dislikes the target—a process called audience tuning (Higgins, 1999). Critically, when participants are later asked to recall the original information about the target person as accurately as possible, they show the same evaluative bias in their own memory of the target person's behaviors—the audience attitude effect on recall, or audience-congruent recall bias (for reviews, see Higgins, 1999; McCann & Higgins, 1992).

This memory bias from audience tuning has been dubbed the "SIB" effect: Communicators' recall of the target person's behaviors is consistent with their audience-tuned message rather than with the original behavioral information about the person (Higgins & Rholes, 1978). Subsequent research has demonstrated that this audience-congruent recall bias is driven by communicators' creation of shared reality with their audience (Echterhoff & Higgins, 2017; Echterhoff et al., 2009; Higgins, 1992). Specifically, recall bias was found when participants wanted to create a shared reality with their audience and experienced having done so successfully, that is, a perceived commonality of inner states with respect to the specific target (Echterhoff et al., 2005, 2008, 2017). For example, the audience-congruent recall bias did not emerge if audience tuning served other goals, such as being polite or obtaining financial incentives (Echterhoff et al., 2008).

Recently, the audience-congruent recall bias has also been shown to be positively correlated with a self-report measure of shared reality (Schmalbach et al., 2019). Because of this critical role of shared reality creation in obtaining the audience-congruent recall bias, the effect is now also referred to as the "sharing-is-believing" effect (Higgins, 2019a; Higgins et al., 2021). In the present article, we use the more descriptive term "audience-congruent recall bias" to distinguish between the memory effect itself and the underlying process. However, we keep the original term "saying-is-believing paradigm" to refer to the established experimental paradigm.

Two major motivational aspects of shared reality creation have been highlighted: the relational motive to be socially connected with the audience and the epistemic motive to acquire valid and true knowledge about the world (Echterhoff & Higgins, 2021; Echterhoff et al., 2009). While relational motivation within communication contexts represents a more general desire for social connection with a communication partner, epistemic motivation is specifically rooted in epistemic trust in the communication partner, that is, the judgment of the partner as a credible source of true and valid information about a given reference topic (Echterhoff et al., 2005, 2009).

Epistemic motivation specifically relates to truth motivation or truth relevance in the ROAR model. It is the inclusion of this motivational aspect in shared reality creation that makes this paradigm well suited to test motivational needs that go beyond typical value-oriented motives.[1] To be sure, this does not mean that shared reality creation cannot, or does not, allow people to achieve control or value-oriented motives. For instance, achieving shared reality about a significant and complex issue, such as the selection of a new employee for a challenging job in one's company, can boost our perceived self-efficacy (control) and make us feel better about ourselves (value). It is clear, however, that the motivational needs achieved by shared reality creation are more than just control or value oriented (Higgins, 2019b). Indeed, epistemic or truth motivation has been identified as a particularly relevant factor in the audience-congruent recall bias in several SIB studies. For example, the recall bias is robustly associated with epistemic trust in the audience (Echterhoff et al., 2005, 2008, 2017). Moreover, it has been found to be stronger after an experimental manipulation that weakens (vs. strengthens) participants' confidence in their own person judgment ability and thus enhances their motivation to seek social verification of their judgments (Kopietz et al., 2010).

Notably, while shared reality research has highlighted the motivational factors of the audience-congruent recall bias, the underlying cognitive processes have not yet been directly investigated. The ROAR model (Eitam & Higgins, 2010; Eitam et al., 2013) suggests that the established audience-congruent recall bias arises from enhanced cognitive accessibility of the audience-congruent (vs. audience-incongruent) information. What renders audience-congruent information more accessible is its higher motivational relevance derived from the shared reality achieved with the audience. Thus, we are proposing a link among the social experience of creating shared reality, motivational relevance from truth motivation, and the cognitive process of accessibility.

To test this proposal, we included measures of cognitive accessibility within the SIB paradigm. Following the ROAR model, cognitive accessibility should be greater for information that is consistent (vs. inconsistent) with the audience's attitude toward the target person, indicating audience-congruent accessibility. Moreover, the established audience-congruent recall bias and audience-congruent accessibility should be positively correlated. In addition, given our proposal that the memory bias is driven by the experience of shared reality, we also explored whether the accessibility bias is associated with a measure of experienced shared reality with the audience (see Schmalbach et al., 2019).

We further assumed that the enhanced accessibility should primarily emerge at the level of trait impressions of the target person rather than at the level of specific behavioral information. This is because people tend to form trait interpretations of other people's behaviors spontaneously (Uleman et al., 1996). Thus, their mental representations of other persons are primarily represented at the more abstract (semantic) trait level rather than at the level of specific behaviors. Extensive previous research has provided evidence for this process of spontaneous trait inference, by which people quickly extract general traits from specific information about another person's behavior, assign this trait information to the other person, and later use such trait representations to construct memories of the person's behavior (e.g., Srull & Wyer, 1989; Uleman et al., 1996, for overviews). Hence, we thought that the audience-congruent accessibility bias would be more likely to emerge for trait representations about a target person. We explored effects also at the behavioral level but had no explicit hypothesis.

Overview of Studies

To examine the role of differential cognitive accessibility as the underlying mechanism of the audience-congruent recall bias, we performed three online studies that complemented the traditional SIB paradigm (Echterhoff et al., 2005; Higgins & Rholes, 1978) by measuring the cognitive accessibility of audience-congruent versus audience-incongruent target information at both the trait level and the behavioral level. In line with previous conceptualizations, we consider accessibility as a critical determinant directly affecting primarily the earliest stages of cognitive processing (occurring spontaneously right after stimulus presentation). Accessibility is typically assessed by implicit measures that require speeded responding, that is, as quickly as possible (De Houwer et al., 2009; Fazio & Olson, 2003, for overviews; Shrum & O'Guinn, 1993, for an application to social reality). The speeded nature of the task minimizes the influence of deliberative or strategic cognitive processes that emerge when participants answer direct questions without time restriction, such as elaboration of retrieved information, relevance appraisal of retrieved information, or evaluation of social desirability of possible answers.

Study 1 was a preliminary study in which we tested two typical measures of cognitive accessibility, both of which have already been applied successfully in other contexts of experimental psychology, one based on an RT task (Dunning et al., 1991; Sanitioso et al., 1990) and one based on a scrambled sentence task (Costin, 1969). Based on the results of this initial study, the task that turned out to be the more sensitive measure of cognitive accessibility—the RT task—was further investigated in Studies 2 and 3 under conditions that were particularly conducive to the creation of a shared reality (experimentally enhanced perception of commonality between communicator and audience).

Study 2 additionally tested how the audience-congruent recall bias might be affected by the inclusion of cognitive accessibility assessment through the RT task. Study 3 further examined whether the audience-congruent accessibility bias differs as a function of whether the specific communication is or is not about that particular target. Across studies, the consistent finding was that audience-congruent information was more accessible than audience-incongruent information, and this difference in cognitive accessibility correlated with subjectively perceived shared reality with the audience and epistemic trust in the audience. The findings support the notion of a motivationally driven audience-congruent accessibility bias as the underlying mechanism that generates the classical audience-congruent recall bias in the SIB paradigm.

Study 1

Cognitive accessibility has not been assessed in SIB studies of shared reality effects on memory. Thus, we designed Study 1 as a

[1] We consider the terms "epistemic motivation" (used in the SIB literature) and "truth motive"/"truth motivation" or "truth relevance" (used by ROAR) as equivalent, referring to the general human motivation to gain true and valid information about the world, while "epistemic trust" is the specific materialization of this motive in a particular communication situation with regard to a specific communication partner.

preliminary study in which two different measures of cognitive accessibility were tested in the SIB paradigm. One of the measures was based on an RT task (speed-based measure) and the other on a choice task (content-based measure). Both measures have been successfully applied already within other research contexts of personality and social psychology (Sanitioso et al., 1990, Study 3; Dunning et al., 1991, Study 5; Costin, 1969; see Method section for detailed descriptions). The measure that turned out to be more sensitive within the SIB paradigm was selected for further investigation in subsequent studies. Apart from the inclusion of these additional measures of cognitive accessibility, the protocol followed the standard procedures of the SIB paradigm (Echterhoff et al., 2005; Higgins & Rholes, 1978).

Finally, participants also filled out questionnaires of subjectively perceived shared reality about the target person (SRT; Schmalbach et al., 2019), epistemic trust, relational motivation, and self-other overlap with respect to their communication partner, which we used for further cross-validation of the expected, audience-consistent accessibility effect. The correlations of these measures with the accessibility effect should generally be positive, in particular for subjective shared reality and epistemic trust, which have been shown to correlate positively with the classical audience-congruent recall bias.

Thus, we predicted that after communicating with the audience about the target, cognitive accessibility of audience-congruent trait information about the target would be higher than audience-incongruent trait information. Also, this effect of audience attitude on the audience-congruent accessibility bias (i.e., difference in accessibility between audience-congruent and audience-incongruent trait information) should predict the magnitude of the subsequent audience-tuning memory bias, that is, the evaluative bias in free recall. Additionally, we explored whether the accessibility bias correlates with subjective indicators of shared reality (Schmalbach et al., 2019).

Transparency and Openness

Study 1 was not preregistered. It mainly served as a "proof-of-principle" study to determine which of two different tasks would be more sensitive to assess cognitive accessibility within our experimental paradigm. On the basis of Study 1, Studies 2 and 3 were preregistered (Study 2: https://aspredicted.org/X97_KD2; Study 3: https://aspredicted.org/JZB_QYC). We report how we determined our sample size, all data exclusions, all manipulations, and all measures in all studies. All materials, data, and analysis codes are either included in the online supplemental materials or are available via Open Science Framework (https://osf.io/adn8p/?view_only=a8ca9c0185204636bfa879bfe96910d5). Data were analyzed using SPSS29.

Method

Participants

A power analysis performed by G*Power (Faul et al., 2007) indicated that at least 128 participants would be required to detect a medium-sized effect of $d = 0.5$ with a statistical power of 0.80 and a Type I error probability of $\alpha = .05$ (two-tailed). Considering the novelty of the two accessibility measures used in the present context, especially within an online study that did not allow clarifications by the experimenter on request, we calculated about 20% more to allow for the possibility of a relatively high sample shrinkage due to major problems that participants might experience with the new tasks. (It turned out that such problems did not occur.) One hundred and sixty-five participants eventually completed the study ($M_{age} =$ 28.1 years, $SD = 13.2$, range: 16–64; 97 female, 68 male, no other; gender was assessed by a drop-down menu with the three response options "male," "female," and "other"). They were recruited online or personally at the local university. Participants took part in the study for curricular credit or the chance of winning a voucher for an online shop (€10). The study was approved by the local ethics committee (reference 2019-25-GE) and was carried out in accordance with the provisions of the Declaration of Helsinki and the American Psychiatric Association ethical standards in the treatment of human study samples. All participants gave informed written consent before participation.

Materials and Procedure

The study was performed via the online platform SoSciSurvey (Leiner, 2019). The general procedure basically followed the standard SIB paradigm (Echterhoff et al., 2005; Higgins & Rholes, 1978). The main adjustment was that we added two tasks designed to assess differential cognitive accessibility of audience-congruent versus audience-incongruent target information. These tasks were performed after the participants' message production.

Participants were informed that they would participate in a study on "person perception and communication." At the beginning of the study, they were informed that they would now be in an online exchange with a communication partner called "Jan," who was introduced as a former volunteer in a group experiment performed at the University of Münster. In order to increase the plausibility of Jan's existence as an online communication partner, the program purportedly first performed an availability check in order to test whether Jan actually was currently available online. Participants were asked to start the study again later if Jan currently turned out to be unavailable (which was actually never the case). After the program had confirmed Jan's current online availability, participants were asked to enter their name or a nickname for their subsequent communication with Jan.

Then, participants read a text describing a target person called "Michael." The text was evaluatively ambiguous, containing several behavioral descriptions of Michael that could be interpreted in either a positive or a negative way (see Supplemental Material S1 in the online supplemental materials for the original German text and English translation). The text was a modified version of the person description used in Schmalbach et al. (2019). Participants were asked to carefully read the text in order to form an impression of Michael. After reading the text, participants received the task to describe Michael for their communication partner Jan. They learned that Jan knows Michael from the previous group experiment and that either he likes Michael or he dislikes Michael (manipulation of audience attitude). The participants were asked to describe Michael in their message to Jan in such a way (without mentioning his name) that Jan would be able to identify him from the description. After they had sent their descriptive message to Jan, participants received feedback that online message transmission to Jan was successful and were then asked to work on some other cognitive tasks, which purportedly served to bridge the time that Jan needed to read the message. These tasks were actually the two tasks to measure cognitive accessibility: the RT task and the scrambled sentence task. The

order of the two tasks was balanced across subjects (RT task first: $n = 183$, scrambled sentence task first: $n = 182$).

RT Task

The RT task was based on the idea that, in a speeded task, enhanced cognitive accessibility of audience-congruent information will lead participants to react faster to audience-congruent than to audience-incongruent information. Such an approach to assess differential accessibility by a reaction-time measure has previously been used by Sanitioso et al. (1990), who found that the self-serving bias in autobiographical recall of desired traits was accompanied by faster recall of autobiographical examples of desired than nondesired traits. A similar approach was also used by Dunning et al. (1991; Experiment 5) in the context of a study on self-serving biases on prototypicality judgments, where goal-oriented and people-oriented participants were presented with various attribute words (including attributes related to goal orientation and people orientation) and asked to indicate for each of the attributes as quickly as possible whether the attribute was associated with the concept of leadership or not. RTs for goal-oriented items were faster for goal-oriented than for people-oriented participants, whereas RTs for people-oriented items were faster for people-oriented than for goal-oriented participants.

The present study measured differences in RTs as a function of audience congruence. We created positively and negatively valenced items in the form of sentences describing traits and behaviors of the target person Michael. In the condition of positive audience attitude (where participants had received the information that their communication partner Jan likes Michael), positive items represented the audience-congruent items and negative items represented the audience-incongruent items. Conversely, in the condition of negative audience attitude (where participants had received the information that their communication partner Jan did not like Michael), negative items represented the audience-congruent items and positive items represented the audience-incongruent items.

Altogether, 40 items were created: 20 items referring to traits (10 positive and 10 negative) and 20 items referring to behaviors (10 positive and 10 negative). The items were constructed as pairs of one positive and one negative item. For trait items, the positive item in the pair referred to a trait that indicated a positive interpretation of a certain paragraph in the original text that participants had read about Michael, while the negative item in the pair referred to a trait that indicated a negative interpretation of the paragraph. For behavioral items, behavioral expressions of the same positive versus negative trait interpretations were created. (The original behavior described in the text was not suitable for this purpose because of its evaluatively ambiguous nature.) For example, the (translated) trait item pair "is thrifty" (positive) versus "is stingy" (negative) and the behavioral item pair "rarely incurs debts" (positive) versus "rarely gives presents" (negative) were created with regard to the seventh paragraph of the original text description of Michael. Care was taken to match the number of syllables used in positive and negative items (in the German language). Some of the items were applicable to several paragraphs of the text. Pilot testing confirmed that positive and negative items indeed differed substantially in perceived valence, both for trait items and for behavioral items. All 40 items are shown in Supplemental Material S2 in the online supplemental materials (original German items and English translations).

For each separate item, participants had to indicate as fast as possible by a keypress whether in their view the respective trait or behavior applied to the target person Michael or not. During task performance, the word "Michael…" was visible above each trial. The keys "v" and "m" on the keyboard served as response keys, with assignment of "yes" and "no" answers to the two keys balanced across subjects. Participants were first familiarized with the task and performed two neutral practice trials. Then, the 40 actual task items were presented successively in random order.

Scrambled Sentences Task

The scrambled sentences task was based on the idea that when participants are asked to create spontaneously any sentence at will from given components and have the option to choose between an audience-congruent and an audience-incongruent component, enhanced cognitive accessibility of audience-congruent information will lead participants to spontaneously choose the audience-congruent alternative with higher probability than the audience-incongruent alternative. A similar approach has previously been adopted by Costin (1969) as a method to measure hostility in an unobtrusive manner. The author created items that contained a number of words that were presented in random order ("scrambled sentences"). The participant's task was to spontaneously create meaningful sentences from the words contained in these "scrambled sentences." Critically, each item allowed the creation of exactly two correct sentences, which differed in their content regarding hostility. This was achieved by the possibility to use one of two critical words within each item to solve the task, one word with low hostility content and one word with high hostility content. For example, in the scrambled sentence "shoot I'll you ask," the words "shoot" and "ask" were the two critical words, allowing participants to generate either the sentence "I'll shoot you" (high hostility option) or the sentence "I'll ask you" (low hostility option). Validating this measure in a group of students who had also been interviewed by psychological experts, Costin (1969) found that students judged by the experts as hostile on the basis of their interview created a substantially higher proportion of "hostile" sentences than students judged as nonhostile.

In the present context, we modified the procedure by using two critical words within each scrambled sentence that differed in valence (positive vs. negative) rather than in high versus low hostility. As for the RT task, trait items and behavioral items were created, referring to the different paragraphs of the original text. According to the intended nature of the task as an indirect measure, no explicit reference to Michael was given in the instructions. However, all items contained the word "he," to make the statements semantically applicable to Michael. For example, a (translated) trait-related item was "he—modest—is—miserly" (with the two critical valenced words "modest" and "miserly"), and a behavioral item was "uses—he—every opportunity—security—deductions—for financial" (with the two critical valenced words "security" and "deductions"), both relating to the seventh paragraph of the original text. The word length of the two critical words within each item was matched as closely as possible (in the German language). The order of the two critical words (positive first or negative first) was counterbalanced. To avoid that all trait items uniformly had the same very simple solution format "He is [adjective]…," the words "quite" (German: "ziemlich") or "very" (German: "sehr") were added in some trait items.

Because it was clear that participants would be increasingly likely to recognize the relation of the task items to possible characterizations

of the target person with increasing task length, the number of items was kept small. Ten behavioral items and five trait items were used. (The item number for traits was even lower than for behaviors, because especially trait items were assumed to make the reference to the target person more obvious.) Pilot testing confirmed that the positive and negative solution sentences indeed substantially differed in perceived valence, both for trait items and for behavioral items. These target-related items were mixed with six filler items (with mostly neutral content) to further obscure the relation to Michael. Some of the filler items allowed only one meaningful solution, so that participants were not led to expect that there were always exactly two possible solutions. All items were scrambled sentences consisting of four to six components, which, during task performance, were arranged in vertical order in the middle of the screen. All target and filler items are shown in Supplemental Material S3 in the online supplemental materials (original German items and English translations).

Participants were told that they would see scrambled sentences on the screen, and their task in each trial would be to press a solution key (the space key on the keyboard) as soon as they were able to create a meaningful sentence from the words shown on the screen. Immediately after they had pressed the solution key, the scrambled sentence disappeared and was replaced by a text box, where participants had to type in their solution sentence. Instructions pointed out that solution sentences were only counted as correct if maximally one of the components within the previously presented scrambled sentence was missing. Participants received the hint that all trials contained the word "he," which could always serve as the subject of the solution sentences. The first three trials always used neutral filler items and served as practice trials. After these three practice trails, the target trials were presented, intermixed with the remaining filler items, in random order.

Free Recall and Questionnaires Related to Shared Reality

After participants had performed the two tasks of cognitive accessibility (order balanced across subjects), the audience-congruent recall bias was assessed (Echterhoff et al., 2005; Higgins & Rholes, 1978). Participants were asked to recall the original text about Michael as accurately as possible, with as many details as possible. Instructions explicitly emphasized that this task was not referring to their own message they had sent to Jan but to the original text they had read. Finally, after this free recall task, participants were asked to fill out a number of questionnaires referring to their subjective psychological perceptions of the communication partner, including perceived shared reality with respect to the target, epistemic trust, and relational motivation (Schmalbach et al., 2019), and self-other overlap (one-item "Inclusion of other" in the self [IOS] scale; Aron et al., 1992), which is a nonverbal measure likewise referring to relational motivation. Our current focus is on perceived shared reality and epistemic trust, but following Schmalbach et al. (2019), we also include the two measures referring to relational aspects between communication partners. The exact items of the verbal scales for perceived shared reality with respect to the target, epistemic trust, and relational motivation are listed in the online supplementing materials. In the additional single-item IOS scale, participants were shown 10 pairs of circles (one circle labeled "self" and one circle labeled "other" according to Aron et al., 1992), with different degrees of overlap between the two circles, and were asked to mark the circle pair that best represents their perceived closeness to their communication partner Jan. Including the different scales related to shared reality was exploratory. Thus, we only assume overall positive associations between all the scales and audience attitude effects, without stating hypotheses regarding differences in the sizes of the correlations.

Statistical Analysis

For the RT task, mean RTs in each condition served as the dependent variable.[2] Separately for trait items and behavioral items, a mixed 2×2 analysis of variance (ANOVA) was performed with the between-subjects factor Audience Attitude (positive vs. negative) and the within-subjects factor Item Valence (positive items vs. negative items). RTs exceeding the mean of an individual by more than 3 *SD*s (separately calculated for trait and behavior items) were regarded as outliers and not included in statistical analyses, as well as generally all RTs below 400 ms. (The rate of RT values that had to be excluded as outliers in the final samples of all studies was lower than 1.5%.) Apart from these outliers, RTs were included in the analyses regardless of which response key was pressed.[3]

To determine the extent of audience attitude effects in RTs independent of positive versus negative attitude, a congruence effect was calculated as RT difference between negative and positive items for the positive audience attitude condition and as RT difference

[2] Due to the within-subject manipulation of the factor "Item Valence," there are different basically equivalent ways to look at audience congruence effects, that is, the expected differential effects of positive versus negative audience attitude, manipulated between subjects, on positively versus negatively valenced items. Specifically, the expected audience congruence effects can be determined by (1) calculating the interaction between Audience Attitude and Item Valence, (2) calculating the difference between positive and negative items as a dependent variable for each participant and comparing this variable between positive and negative audience attitude conditions, or (3) calculating the difference between audience-congruent and audience-incongruent items (regardless of valence per se) as a dependent variable for each participant and comparing this variable to zero (or between conditions of any additional independent variable). Theoretically, we were only interested in the difference between audience-congruent and audience-incongruent conditions, regardless of whether the audience attitude is positive or negative (Option 3). However, we think that readers would be interested also in the exact values for positive versus negative audience attitude, including the absolute RTs in each condition. Statistically, we therefore describe the effect of interest (audience congruence effect) according to Option 1 and—for the purpose of simplified presentation in the tables—according to Option 2.

[3] Other dependent variables for the operationalization of the concept of cognitive accessibility are conceivable within our RT task. For example, it could be argued that explicit "yes"/"no" judgments in a speeded task can also be regarded as a possible index of cognitive accessibility. However, in line with established research methods in the field (e.g., De Houwer et al., 2009; Fazio & Olson, 2003; Herring et al., 2013), we consider RTs as the more appropriate indicator for the automatic, nondeliberative processes in which we are interested here. This is because it is less likely that speeded RTs (vs. explicit answers) are deliberately controlled. Regarding the operationalization of cognitive accessibility by RTs, another possibility is to confine analyses to RTs to "yes" answers. On the one hand, this approach has the advantage that RT results cannot be affected by decision outcomes (because the outcome is held constant). On the other hand, the approach faces limitations due to data loss because not all valid trials of the RT task are included in the actual statistical analyses. Also, the number of included trials varies considerably between participants, which may increase error variance in the data. For control purposes, we consider these alternative dependent variables (proportion of "yes" answers; RTs to only "yes" answers) in the Supplementary Control Analyses Across Experiments section. To foreshadow, the pattern of results remained essentially unaffected by which specific dependent variable was used.

between positive and negative items for the negative audience attitude condition. Thus, for all participants, a higher value indicated a greater audience-congruent accessibility bias, that is, faster RTs for audience-congruent than for audience-incongruent information.

For the scrambled sentences task, the percentage of positively valenced solution sentences was compared by *t* tests between the positive and the negative audience attitude group separately for trait items and behavioral items. (Alternatively, the percentage of negatively valenced solution sentences could have been chosen as the dependent variable, which would yield the same statistical results with the opposite direction of mean differences.) To determine the extent of audience attitude effects in the scrambled sentences task independent of positive versus negative audience attitude, the effect was determined as the percentage of positive solution sentences for the positive audience attitude condition and as the percentage of negative solution sentences for the negative audience attitude condition.

The classical audience-congruent recall bias as well as audience tuning of the message were determined by established procedures (Echterhoff et al., 2005). Two raters blind to experimental conditions assessed the valence of each message text and each recall text on a rating scale ranging from $-5 =$ *extremely negative* to $+5 =$ *extremely positive*. In cases of deviations between the two raters of 2 points or more, the raters were asked to discuss about the reasons for their respective evaluations, with the possibility (but not necessity) to reconsider their own initial rating in light of this discussion. The average of the two final ratings served as the dependent variable. Interrater correlations for final ratings were $r = .96$ for message ratings and $r = .82$ for recall ratings.

To examine audience tuning of the message and the audience-congruent recall bias, *t*-test comparisons between positive and negative audience attitude conditions were performed for message ratings and recall ratings, respectively. We also created unipolar scores for the audience-congruent message bias (audience tuning per se) and the audience-congruent recall bias. To obtain recall bias scores regardless of positive versus negative attitude conditions, valence ratings were multiplied by -1 in the condition of negative audience attitude, such that greater bias in the direction of the audience's attitude was reflected in higher values for all participants.

Results

Effects of Positive Versus Negative Audience Attitude

Table 1 shows means of cognitive accessibility measures and valence scores for message and recall as a function of positive versus negative audience attitude. In the RT task, as predicted, a positive audience attitude yielded faster RTs for positive than for negative trait items, whereas when the audience attitude was negative, faster RTs were found for negative than for positive trait items. The predicted interaction between audience attitude and trait item valence was highly significant, $F(1, 163) = 9.53$, $p = .002$, $\eta_p^2 = .055$. No such interaction was found for behavioral items, $F(1, 163) = 2.24$, $p = .137$, $\eta_p^2 = .014$. For both trait items and behavioral items, there were no significant main effects of audience attitude or item valence. The overall audience-congruence effect on RTs for trait information, that is, the RT difference between incongruent and congruent conditions regardless of positive versus negative audience attitude, is visualized in the left panel of Figure 1.

In the scrambled sentences task, the effect that was expected for trait items pointed into the predicted direction but failed to reach significance level, $t(163) = 1.61$, $p = .11$. There was also no significant effect of audience attitude for the behavioral items, $t(163) = 0.43$, $p = .67$. Regarding text valence, there was a significant audience tuning effect in the message production, $t(163) = 5.46$, $p < .001$, but the recall valence did not differ significantly between positive and negative audience attitude, $t(163) = 0.73$, $p = .47$.

For exploratory purposes, the factor task order (RT task first vs. scrambled sentences task first) was additionally included in the analyses of accessibility measures. The audience attitude effects did not significantly interact with task order ($p < .28$). Numerically, the effects in the RT task were stronger when the task was performed first. The scrambled sentences task yielded weaker effects when it was performed first.

Correlations Between Audience Attitude Effects

Table 2 shows the intercorrelations between the audience attitude effects in the different measures. (As described in the Method section, the audience attitude effects in this analysis were determined in such a way that higher numbers always indicated a higher bias in the direction of audience congruence for all participants, regardless of whether the audience attitude was positive or negative.) All correlations are numerically positive, confirming the assumed basic theoretical connection between all measures. The audience-congruent recall bias was predominantly predicted by the extent of previous message tuning, in line with previous SIB studies pointing out the importance of the own communication as a determinant of the effect. In the context of the present study, we focused on the correlation between the audience-congruent recall bias with the audience-congruent accessibility bias, obtained from the novel RT task. As expected, enhanced accessibility of audience-congruent as compared to audience-incongruent trait information (both when measured in the RT task and the scrambled sentences task) significantly predicted the audience-congruent recall bias, although the correlations were numerically not very high ($r = .18$ and $r = .16$, respectively). Correlations of similar size were also found between both accessibility measures on the behavioral level as predictors of the recall bias, reaching significance for the scrambled sentences task ($r = .17$, $p = .03$) and marginal significance for the RT task ($r = .17$, $p = .06$).

Correlations of Audience Attitude Effects With Questionnaires Related to Shared Reality

Table 3 shows the correlations between audience attitude effects and questionnaire measures of subjective psychological perceptions of the communication partner, including perceived shared reality with respect to the target, epistemic trust, and relational motivation (Schmalbach et al., 2019). Subjective experiences of shared reality about the target and epistemic trust in the communication partner correlated positively with all audience attitude effects, reaching significance for the association with the RT effects for trait items, as well as for message tuning, which also correlated significantly with the IOS. Subjectively perceived shared reality was also significantly associated with audience attitude effects in the scrambled sentences task for behavioral items. No other correlations reached significance.

Table 1
Means of Cognitive Accessibility Measures, Message Valence, and Recall Valence in the Positive Versus Negative Audience Attitude Condition in Study 1

Outcome variable	Positive audience attitude	Negative audience attitude	*p* value for pairwise comparisons
RT task: RTs (ms)			
Traits—positive items	1,457 (384)	1,520 (508)	.37
Traits—negative items	1,547 (382)	1,436 (443)	.09
Traits—diff. pos.–neg. items	**−91 (338)**	**84 (388)**	**.002****
Behavior—positive items	2,174 (550)	2,055 (491)	.15
Behavior—negative items	2,183 (532)	2,145 (536)	.65
Behavior—diff. pos.–neg. items	−9 (376)	−90 (313)	.14
Scrambled sentences task: positive choices (%)			
Trait items	**58.90 (28.41)**	**51.69 (29.11)**	**.11**
Behavioral items	51.99 (17.18)	50.94 (13.70)	.66
Text valence			
Message	0.66 (1.93)	−1.04 (2.08)	<.001**
Recall	**0.20 (1.03)**	**0.09 (0.99)**	**.47**

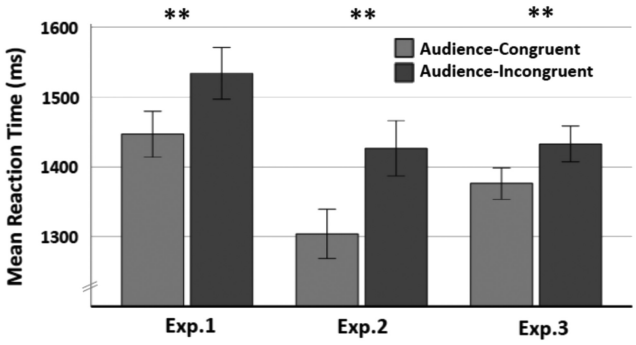
Note. Numbers in parentheses indicate standard deviations. Values in bold refer to hypotheses. RT = reaction time; diff. pos.–neg. = difference between positive and negative items.
** $p < .01$.

Discussion

Study 1 addressed, for the first time, the question of differential accessibility of audience-congruent versus audience-incongruent target information as the cognitive basis of the audience-congruent recall bias, an evaluative memory bias that is motivationally driven by shared reality creation with an audience. Because there was no prior experience with the use of accessibility measures within the SIB paradigm, we tested two different measures that had already been applied successfully in previous studies in other topics within research on personality and social psychology, that is, a reaction-time measure (Dunning et al., 1991; Sanitioso et al., 1990) and a measure relying on a scrambled sentences task (Costin, 1969). The main aim was to establish at least one of these approaches as a sufficiently sensitive method to detect differential cognitive accessibility of audience-congruent versus audience-incongruent target information within the SIB paradigm. Considering that the SIB paradigm relies on basic mechanisms of person perception, we expected differential cognitive accessibility, especially on the trait level of target-related information processing. This is because people typically represent information about other persons on this more abstract (semantic) level rather than on the level of specific behaviors, even when the original information that they receive is only about specific behaviors that the other person shows in certain episodes or situations (Srull & Wyer, 1989; Uleman et al, 1996).

Thus, provided that a measure of cognitive accessibility is sensitive enough within the present context, we expected that cognitive accessibility for audience-congruent trait information about the target would be higher than for audience-incongruent trait information and that this effect of audience attitude on cognitive accessibility would correlate positively with the audience-congruent recall bias, as well as with subjectively perceived shared reality and epistemic trust in the audience (Echterhoff et al., 2008; Kopietz et al., 2010; Schmalbach et al., 2019). The RT task to measure cognitive accessibility met all these criteria, while the scrambled sentences task met them only partly. Most critically, the audience congruence effect per se did not reach significance in the scrambled sentences task. Thus, the RT task turned out to be a generally suitable task and also to be the more sensitive measure in comparison to the scrambled sentences task. We therefore selected the RT task for further investigation in subsequent experiments.

Figure 1
RTs for Audience-Congruent Versus Audience-Incongruent Target-Related Trait Information in the Three Studies



Note. Error bars indicate standard error of the mean. RT = reaction time; Exp.1 = Experiment 1; Exp.2 = Experiment 2; Exp.3 = Experiment 3.
** $p < .01$.

Study 2

Study 1 was designed as a preliminary study to generally explore the suitability of two different measures of cognitive accessibility within the SIB paradigm. The RT task in particular turned out to be a sufficiently sensitive measure, yielding a pattern of results consistent with the assumed differential cognitive accessibility of audience-congruent versus audience-incongruent semantic (trait) information about the target as the basis for a shared-reality-driven memory bias. The primary aim of Study 2 was to replicate the findings from the RT task under partly modified conditions. The following modifications were introduced: First, the scrambled sentences task was omitted, so that any possible mutual interference between

Table 2
Intercorrelations Between the Different AAEs in Study 1

Outcome variable	*r*/*p* value	AAE-RT traits	AAE-RT behavior	AAE-ScS traits	AAE-ScS behavior	AAE message	AAE recall
AAE-RT traits	*r*	—					
	p						
AAE-RT behavior	*r*	.02	—				
	p	.82					
AAE-ScS traits	*r*	.29**	.10	—			
	p	<.001	.20				
AAE-ScS behavior	*r*	.21**	.06	.29**	—		
	p	.006	.47	<.001			
AAE message (audience tuning)	*r*	.26**	.07	.16*	.14	—	
	p	<.001	.39	.04	.08		
AAE recall (recall bias)	*r*	**. 18***	.15	**.16***	.17*	.43**	—
	p	**.02**	.06	**.04**	.03	<.001	

Note. $N = 165$. Values in bold refer to hypotheses. RT = reaction time task; ScS = scrambled sentences task; AAE = audience attitude effect.
* $p < .05$. ** $p < .01$.

the two cognitive accessibility tasks could be excluded. Second, we wanted to overcome one major drawback in the results from Study 1; that is, the audience attitude effect on recall valence did not reach significance. The interpretation of differential accessibility as the cognitive basis of the audience-congruent recall bias would be more convincing if the latter actually emerges to a substantial extent. For this purpose, we introduced conditions that were particularly conducive to the generation of shared reality. Specifically, three different manipulations were used to increase participants' perceived commonality with their audience. One of the manipulations was performed before the communication (common picture judgment with the audience), another one after the communication (feedback about successful target identification by the audience), and a third manipulation combined both of them (see Method section for details). With these manipulations aiming to support shared reality creation, we expected to find both the audience-accessibility recall bias and the audience-congruent recall bias, with the strongest magnitude in the combined manipulation condition.

Finally, we also explored in Study 2 whether there is any effect of assessing cognitive accessibility using the RT measure per se on the subsequently measured audience-congruent recall bias. In Study 1, we found the expected significant correlation between accessibility effects and the audience-congruent recall bias. However, the RT assessment of cognitive accessibility might be either boosting or dampening this correlation, depending on how the inclusion of the RT task affects the subsequent bias in free recall. Within the RT task, both audience-congruent and audience-incongruent information is presented to participants (with exactly 50% positive and 50% negative statements about the target person).

Ideally, the balanced presentation of positive and negative items would leave the valence bias in the subsequent recall task completely unaffected (just as if the task would not have been performed at all). Even with balanced presentation of positive and negative items, however, participants' processing of these items need not necessarily be balanced. Unbalanced processing could occur in two directions. On the one hand, audience-congruent information

Table 3
Correlations Between the Different AAEs With Questionnaires Targeting Subjective Experiences Related to Shared Reality in Study 1

Outcome variable	*r*/*p* value	SRT	Epistemic trust	Relational motivation	IOS
AAE-RT traits	*r*	.26**	.20*	.12	.04
	p	.001	.01	.12	.61
AAE-RT behavior	*r*	.03	.12	.07	−.04
	p	.70	.13	.35	.63
AAE-ScS traits	*r*	.14	.15	−.03	.01
	p	.08	.06	.75	.86
AAE-ScS behavior	*r*	.16*	.06	.04	.03
	p	.04	.48	.62	.73
AAE message (audience tuning)	*r*	.36**	.20*	.10	.17*
	p	.001	.01	.22	.03
AAE recall (recall bias)	*r*	.11	.14	.14	.02
	p	.18	.07	.07	.76

Note. $N = 165$. SRT = shared reality about a target (Schmalbach et al., 2019); IOS = inclusion of other in the self (Aron et al., 1992); RT = reaction time task; ScS = scrambled sentences task; AAE = audience attitude effect.
* $p < .05$. ** $p < .01$.

could receive more weight than it would naturally have without this task (due to participants' shared reality goals), and in this case, this additional processing would likely further enhance the subsequent recall bias. On the other hand, it is also possible that audience-incongruent information could receive more weight than it would naturally have without this task (e.g., because by reading these items, participants are led to actively process and think about audience-incongruent target information to an extent that they would not do on their own), and in this case, the subsequent recall bias could even be dampened. In the first case, the empirically obtained correlation between the audience-attitude biases in the two tasks (accessibility bias and recall bias) would overestimate the real relationship between them, and in the second case, it would underestimate it. Both cases would be important outcomes to be considered for the interpretation of the results. To examine these possibilities, in Study 2, half of the participants did not perform the RT task before the free recall task. Instead of the RT task, these participants performed a short, unrelated filler task. The study (experimental design, hypotheses, analysis plan) was preregistered (https://aspredicted.org/X97_KD2).

Method

Participants

We determined the sample size based on the results from Study 1. Because the scrambled sentences task was omitted in Study 2, we estimated the effect size expected for the audience attitude effect in the RT measure of cognitive accessibility on the basis of the effect size obtained for the RT task in Study 1 in the condition where it was presented before the scrambled sentences task and was therefore unaffected by it ($\eta_p^2 = .077$). For the free recall task, we expect an effect of at least lower medium size ($\eta_p^2 = .04$) for audience attitude effects. In most of the published laboratory studies, this effect is typically substantially higher (e.g., Echterhoff et al, 2005; Kopietz et al, 2010), but we assume that it may be attenuated in an online version. For effects of type of commonality creation, we wished to be able to detect effects of at least upper medium size ($\eta_p^2 = .08$). Assuming these effect sizes, with an α error of .05 and a power of 0.80, a power analysis using G*Power (Faul et al., 2007) showed a total required sample size of at least 119 for the RT task (included in half of the experimental groups) and at least 235 for the free recall task (included in all experimental groups). To allow shrinkage of about 10%, we planned to record at least 264 usable data sets. Finally, 294 participants completed the study. Five participants had to be excluded due to obvious ignorance of instructions (production of nonsense texts or obvious inattentiveness during the RT task), leaving 289 participants for statistical analyses ($M_{age} = 25.9$ years, $SD = 8.8$, range: 18–68; 225 female, 62 male, two with other gender identity).

Materials and Procedure

The study followed the same procedures as Study 1, with the following modifications: First, the scrambled sentences task was omitted so that only the RT task was used to assess cognitive accessibility of audience-congruent versus audience-incongruent target information. Second, for half of the sample, this RT task was also omitted. That is, cognitive accessibility was not assessed at all in this subsample, as in the classical SIB paradigm, which uses only the recall bias to assess shared reality effects of communication with a partner. These participants performed an unrelated simple distractor task (math task consisting of additions and subtractions of two-digit numbers) instead of the RT task. By comparing the conditions with and without the RT task, we could examine the influence of assessment of cognitive accessibility by the RT task on the subsequently assessed audience-congruent recall bias.[4] Third, the study was designed to create conditions that were particularly conducive to the creation of shared reality. For this purpose, three different manipulations were used to achieve this by enhancement of subjectively perceived commonality between the participants and their communication partner. One manipulation, a picture judgment task, was performed precommunicatively (condition "pictures"), another manipulation (condition "feedback") was performed postcommunicatively, and a third condition ("pictures and feedback") combined both of these manipulations. Participants were assigned randomly to one of the conditions.

All participants were initially informed that they would participate in a study on "person perception and communication" and were introduced to Jan as their communication partner in the same way as in Study 1. In the conditions "pictures" and "pictures and feedback," participants were informed, just after they had entered their name for the communication with Jan, that they would first perform a short task together with Jan, which would serve to get to know each other. In this task, the participants were asked to judge three pictures depicting ambiguous social scenes by giving "yes" versus "no" answers to four statements that were presented with each picture (following a procedure from Kopietz et al., 2010, with material from Schmalt et al., 2000). The communication partner Jan ostensibly performed the same task simultaneously. To support credibility of this procedure, all participants received after this task the information that Jan had not yet completed the task, so that they had to wait a short time until Jan would also have finished all the picture judgments. The next screen (appearing after 10 s) stated that both communication partners had now finished the task, and that a comparison of the answers showed that there was a concordance of 93% in the judgments (matching of 11 of the altogether 12 answers). It was pointed out that this degree of concordance was considerably higher than the average.

As in Study 1, all participants then read the text about the target person Michael, learned about Jan's attitude about Michael, and then wrote a description of Michael as message to Jan. In the conditions "feedback" and "pictures and feedback," participants were informed after having sent their descriptive message to Jan that they had received the following message from Jan (translated from

[4] We deliberately did not include a condition in which the RT task followed the free recall task. Because there are 50% positively valenced and 50% negatively valenced items in the RT task, there is a strict experimental control of the amount of audience-congruent versus audience-incongruent information about the target person that is presented during this task. Consequently, any effect in the subsequent free recall task is unconfounded by this factor, that is, it cannot simply be attributed to a previous unbalanced presentation of audience-congruent versus audience-incongruent information during the RT task. There is no such control in the opposite case, when free recall comes first. In fact, the occurrence of the classical SIB effect in free recall, which by definition represents an unbalanced activation of positive versus negative target information, would then confound the subsequent assessment of cognitive accessibility in the RT task by the predominant preactivation of audience-congruent information during recall.

German): "The description clearly applies best to a participant called Michael. I know Michael very well from the previous group work, and I think that the description suits him quite well. Am I right?" Participants then received the opportunity to send an own message as an answer to Jan.

In each of the three commonality conditions, half of the participants subsequently performed the RT task, and the other half performed the unrelated distractor task (math task). Then, as in Study 1, all participants performed the free recall task, in which they were asked to write down the original information they had read about Michael, and finally filled out the questionnaires on perceived shared reality, epistemic trust, and relational motivation (Schmalbach et al., 2019). In the final sample, the numbers of participants in the 12 subgroups resulting from the combinations of the between-subjects manipulations ranged between 22 and 26. (Exact subgroup sizes differ to some extent between conditions due to random condition assignment and exclusion criteria based on individual data.)

Results

Effects of Positive Versus Negative Audience Attitude

For both trait items and behavioral items in the RT task, a mixed 2 × 3 × 2 ANOVA was performed with the between-subjects factors Audience Attitude (positive vs. negative) and Commonality Manipulation ("pictures," "feedback," and "pictures and feedback"), and the within-subjects factor Item Valence (positive items vs. negative items). We first describe the results independent of the type of commonality manipulation. Table 4 shows the respective means for RTs in the RT task and for text valences of message and recall. Consistent with the results from Study 1, the expected interaction between item valence and audience attitude for trait items in the RT task was found to be highly significant, $F(1, 138) = 12.73$, $p < .001$, $\eta_p^2 = .084$. The overall audience-congruence effect on RTs for trait information in Study 2 (RT difference between incongruent and congruent conditions regardless of positive vs. negative audience attitude) is visualized in the middle panel of Figure 1. There was also a significant main effect of item valence, with faster RTs for positive than for negative items, $F(1, 138) = 5.31$, $p = .023$, $\eta_p^2 = .037$, and there was a tendency to react faster under negative than positive audience attitude conditions, $F(1, 138) = 3.59$, $p = .060$, $\eta_p^2 = .025$, for main effect of audience attitude. No significant effects were found for behavioral items (all $ps > .20$).

Regarding text ratings, interrater correlations of text valence were $r = .93$ for message ratings and $r = .81$ for recall ratings. For both message valence and recall valence, a 2 × 3 × 2 between-subjects ANOVA was performed with the independent variables Audience Attitude (positive vs. negative), Commonality Manipulation ("pictures," "feedback," and "pictures and feedback"), and RT Task (present vs. absent). Not only message tuning but also the audience-congruent recall bias was overall significant, main effect of audience attitude for message valence, $F(1, 277) = 81.66$, $p < .001$, $\eta_p^2 = .228$; for recall valence, $F(1, 277) = 4.38$, $p = .037$, $\eta_p^2 = .016$, as expected. The possible influence of the RT task on the audience-congruent recall bias was explored by comparing the conditions with versus without the inclusion of the RT task. The audience-congruent recall bias appeared to be attenuated to some extent when the previous RT task was included, because it only reached significance under conditions where the RT task was not performed (see Table 5). However, the formal interaction between audience attitude and presence versus absence of the RT task was not significant ($p = .29$), indicating that the data from the condition that included the RT task still contributed to the overall effect.

Regarding type of commonality manipulation (see Table 5), we expected that all audience attitude effects would be more pronounced in the combined manipulation ("pictures and feedback") compared to only the single manipulations (either "pictures" or "feedback"). The expected Audience Attitude × Commonality Manipulation interaction was found for trait items in the RT task, but not for behavioral items or for the audience-congruent recall bias. Unexpectedly, in the latter case, the effect was numerically

Table 4

Means of RTs, Message Valence, and Recall Valence in the Positive Versus Negative Audience Attitude Condition in Study 2, Collapsed Across All Three Commonality Manipulation Conditions

Outcome variable	Positive audience attitude	Negative audience attitude	*p* value for pairwise comparisons
RT task: RTs (ms)			
Traits—positive items	1,328 (339)	1,325 (401)	.97
Traits—negative items	1,531 (654)	1,281 (361)	.005**
Traits—diff. pos.–neg. items	**−203 (550)**	**44 (280)**	**<.001****
Behavior—positive items	2,074 (662)	1,956 (714)	.31
Behavior—negative items	2,140 (693)	1,986 (732)	.20
Behavior—diff. pos.–neg. items	−66 (367)	−30 (528)	.64
Text valence			
Message	0.92 (1.52)	−0.84 (1.77)	<.001**
Recall overall	**0.23 (1.08)**	**−0.02 (0.93)**	**.037***
Recall without previous RT task	0.38 (0.86)	0.01 (0.83)	.011*
Recall with previous RT task	0.09 (1.24)	−0.05 (1.03)	.49

Note. Numbers in parentheses indicate standard deviations. Values in bold refer to hypotheses. RT = reaction time; diff. pos.–neg. = difference between positive and negative items.
* $p < .05$. ** $p < .01$.

Table 5
Means of RTs, Message Valence, and Recall Valence in the Positive Versus Negative Audience Attitude Condition in Study 2, Separately for the Three Different Commonality Manipulation Conditions

Outcome variable	Positive audience attitude	Negative audience attitude	*p* value for pairwise comparisons
	RT task: RTs (ms)		
Traits—positive items			
Pictures	1,344 (322)	1,333 (432)	.92
Feedback	1,330 (387)	1,362 (447)	.79
Pictures and feedback	1,310 (312)	1,280 (322)	.74
Traits—negative items			
Pictures	1,443 (474)	1,280 (336)	.18
Feedback	1,347 (446)	1,312 (443)	.78
Pictures and feedback	1,803 (877)	1,252 (296)	.007**
Traits—diff. pos.–neg. items			
Pictures	−98 (394)	54 (375)	.19
Feedback	−17 (201)	50 (229)	.28
Pictures and feedback	**−493 (774)**	**27 (220)**	**.004****
Behavior—positive items			
Pictures	2,021 (625)	2,078 (896)	.81
Feedback	2,046 (777)	1,988 (755)	.79
Pictures and feedback	2,151 (582)	1,800 (392)	.018*
Behavior—negative items			
Pictures	2,052 (567)	1,977 (598)	.66
Feedback	2,105 (776)	2,049 (978)	.83
Pictures and feedback	2,255 (718)	1,928 (561)	.085
Behavior—diff. pos.–neg. items			
Pictures	−31 (288)	100 (760)	.45
Feedback	−59 (358)	−61 (392)	.98
Pictures and feedback	−104 (443)	−127 (326)	.84
	Text valence		
Message			
Pictures	0.96 (1.53)	−0.94 (1.84)	<.001**
Feedback	0.85 (1.55)	−0.80 (1.82)	<.001**
Pictures and feedback	0.96 (1.52)	−0.77 (1.68)	<.001**
Recall overall			
Pictures	0.17 (1.09)	−0.14 (0.80)	.12
Feedback	0.39 (0.95)	−0.11 (1.10)	.019*
Pictures and feedback	**0.13 (1.19)**	**0.20 (0.85)**	**.76**
Recall without previous RT task			
Pictures	0.42 (0.69)	−0.23 (0.74)	.003**
Feedback	0.65 (0.73)	0.08 (0.87)	.018*
Pictures and feedback	0.08 (1.05)	0.19 (0.84)	.70
Recall with previous RT task			
Pictures	−0.09 (1.36)	−0.04 (0.86)	.88
Feedback	0.14 (1.07)	−0.30 (1.28)	.19
Pictures and feedback	0.19 (1.33)	0.21 (0.87)	.95

Note. Numbers in parentheses indicate standard deviations. Values in bold refer to hypotheses. RT = reaction time; diff. pos.–neg. = difference between positive and negative items.
* $p < .05$. ** $p < .01$.

even reversed (instead of being enhanced) in the combined manipulation condition.

Correlation Analyses

The correlations of the different audience attitude effects with each other and with the questionnaires related to shared reality are shown in Tables 6 and 7, respectively. Except for one case, all correlations were numerically positive. As expected, the audience attitude effect in RTs for trait information again correlated significantly with perceived shared reality and with epistemic trust in the communication partner. Its correlation with the audience-congruent recall bias did not reach significance ($r = .09$, $p = .30$).

Discussion

Study 2 further investigated the RT measure of cognitive accessibility from Study 1 within the SIB paradigm. The main aim was to replicate the audience-congruent accessibility bias in RTs from Study 1 under conditions in which the RT task could not be influenced by the additional scrambled sentences task that was included in Study 1. We also hoped to find a significant audience-congruent recall bias. These goals were achieved based on manipulations that enhanced perceived commonality between participants and their audience. The results overall corroborate the findings from Study 1 of differential cognitive accessibility of audience-congruent versus audience-incongruent trait information about the target as a result

Table 6
Intercorrelations Between the Different AAEs in Study 2

Outcome variable	*r*/*p* value	AAE-RT traits	AAE-RT behavior	AAE message	AAE recall
AAE-RT traits	*r*	—			
	p				
AAE-RT behavior	*r*	.21*	—		
	p	.013			
AAE message (audience tuning)	*r*	.19*	.27**	—	
	p	.023	.001		
AAE recall (recall bias)	*r*	**.09**	.11	.26**	—
	p	**.30**	.19	<.001	

Note. $N = 144$ (except for correlation between AAE message and AAE recall, which is based on $N = 289$). Values in bold refer to hypotheses. AAE = audience attitude effect; RT = reaction time task.
* $p < .05$. ** $p < .01$.

of shared-reality creation, and there was no significant effect for behavioral information. As in Study 1, RTs for target-related trait information depended on the audience's attitude toward the target, with faster RTs for congruent than for incongruent information. As in Study 1, the extent of this effect again was significantly associated with perceived shared reality with the audience and epistemic trust in the audience.

The direct correlation with the audience-congruent recall bias did not reach significance. This latter finding has to be seen in view of another relevant finding from this study: A comparison of the audience-congruent recall bias between conditions with and without prior assessment of cognitive accessibility through the RT task showed that, if anything, the RT task appeared to have a dampening rather than a boosting influence on the subsequent recall bias. This would explain that the recall bias did not reach significance per se in Study 1 and in the subsample of Study 2, in which, as in Study 1, the RT task preceded free recall. This outcome also means that the direct correlation between the two measures underestimates the actual relationship, that is, the empirical correlation represents a rather conservative estimate of the true relationship. This may be the reason for the numerically relatively low (and, in the present case, nonsignificant) values for this correlation that we have observed. On the other hand, we can be confident that the positive correlations that we obtained are valid indicators of a true positive association and not simply mere artifacts of the inclusion of the additional RT task in order to assess cognitive accessibility.

Regarding the comparison of the three types of commonality creation, an inconclusive pattern of results emerged. As expected, the double manipulation ("pictures and feedback") exerted stronger audience attitude effects on trait information in the RT task than the single manipulations by either "pictures" or "feedback." However, this was not the case for the audience-congruent recall bias. Here, unexpectedly, the effect was numerically even reversed (instead of being enhanced) in the combined manipulation condition. Thus, although the manipulations overall produced the expected audience-congruent recall bias, the double manipulation did not contribute to it. These opposite contributions of the double manipulation on the audience attitude effects in the RT task versus the free recall task might also be a reason for the lower correlation between the two variables compared to Study 1. One possible explanation for these unexpected findings could be that participants in the double manipulation became more skeptical due to the simultaneous nature of two manipulations and therefore lost epistemic trust in the communication partner. However, this was not the case, because epistemic trust in the partner did not differ between commonality conditions ($p = .30$) and was numerically even higher in the double manipulation than in the other conditions.

Table 7
Correlations Between the Different AAEs With Questionnaires Targeting Subjective Experiences Related to Shared Reality in Study 2

Outcome variable	*r*/*p* value	SRT	Epistemic trust	Relational motivation	IOS
AAE-RT traits	*r*	.24**	.20*	.13	.10
	p	.003	.014	.11	.24
AAE-RT behavior	*r*	.05	.15	.10	.20*
	p	.58	.08	.26	.015
AAE message (audience tuning)	*r*	.14*	.10	.20**	.29**
	p	.02	.104	.001	<.001
AAE recall (recall bias)	*r*	.10	.15*	.09	−.03
	p	.102	.012	.15	.60

Note. $N = 144$ for RT effects, $N = 289$ for AAE in message and recall. SRT = shared reality about a target (Schmalbach et al., 2019); IOS = inclusion of other in the self (Aron et al., 1992); RT = reaction time task; AAE = audience attitude effect.
* $p < .05$. ** $p < .01$.

Study 3

We conducted a third study to replicate and further corroborate the core findings from Study 1 and Study 2. Study 1 established an RT measure of cognitive accessibility associated with shared reality creation by showing that after communication with the audience about the target, cognitive accessibility for audience-congruent trait information about the target, as assessed with this measure, was higher than for audience-incongruent trait information, and this effect of audience attitude on cognitive accessibility predicted the subsequent audience-congruent recall bias. Supporting the relation to shared reality creation, the effect of audience attitude on cognitive accessibility also correlated with subjectively perceived shared reality and epistemic trust in the audience. The classical recall bias, however, did not emerge to a substantial extent in that study, and there could have been interfering effects by another measure of cognitive accessibility (the scrambled sentences task) that was additionally used in Study 1. Study 2 remedied these issues, revealing the audience-congruent recall bias. In Study 2, however, the positive correlation of the RT effect with the audience-congruent recall bias did not reach significance, but this was partly due to the fact that the testing of cognitive accessibility in the RT task dampened the subsequent recall bias. This finding means that the empirically obtained correlation between the two biases likely underestimates the true value of the correlation. The fact that it was still significant in Study 1 may again be due to additional influences of the additional scrambled sentences task.

In Study 3, we aimed to obtain both a significant audience-congruent recall bias (as in Study 2) and a significant positive correlation between the RT effect with the audience-congruent recall bias (as in Study 1)—in addition to the significant RT effect per se (as already found consistently in Studies 1 and 2). To achieve this, we performed a new study based on the procedures from Study 2, but attempted to increase power by a larger sample size (calculated on the basis of the actual empirical effects obtained in Study 2) in combination with modified procedures. Specifically, compared to Study 2, the following changes were introduced in Study 3. First, all participants (not only half of them) performed both the RT task and the free recall task, so that the power regarding the predicted correlation between the accessibility bias and the recall bias was enhanced. Second, the double manipulation condition of commonality, which had partly counterintuitive effects in Study 2, was removed and replaced by a standard SIB condition without an additional manipulation of perceived commonality. This allowed us to examine the extent to which the "pictures" and the "feedback" condition actually affect audience attitude effects in comparison to a standard SIB condition. We assumed that the effects would be stronger than in the standard condition.

In addition, we also varied the type of communication between the interaction partners. Whereas half of the participants communicated with their audience about the target person Michael, about whom they knew the audience's attitude, as in Studies 1 and 2, the other half communicated about another person, specifically about U.S. President Joe Biden about whom they did not know the audience's attitude. Previous studies on shared reality have shown that the audience-congruent recall bias disappears when overt communication is prevented (Higgins & Rholes, 1978; Higgins et al., 2007). Because target specificity has been described as a critical aspect of shared reality creation (Echterhoff et al., 2009), we assumed reduced effects also under conditions when communication actually takes place but does not refer to the target about whom the audience's attitude is known. Thus, stronger effects should be obtained with target-related communication (about Michael) than with target-unrelated communication (about Joe Biden). Together, by including the standard SIB condition and a condition of target-unrelated communication in Study 3, more variance in the audience attitude effects than in Study 2 could be expected and, hence, in combination with greater power due to the enhanced sample size, also the likelihood to detect a positive correlation between the effects. The study (experimental design, hypotheses, analysis plan) was preregistered (https://aspredicted.org/JZB_QYC).

Method

Participants

Based on results from Study 2 (excluding the double commonality manipulation condition), we expected effect sizes of at least $\eta_p^2 = .032$ for the audience attitude effect in the RT task, and $\eta_p^2 = .041$ in the free recall task. For main and interaction effects involving the factors "Type of Commonality Creation" and "Target-Related Communication," we wished to be able to detect effects of at least medium size ($\eta_p^2 = .06$). Assuming these effect sizes, with an α error of .05 and a power of 0.80, a power analysis using G power (Faul et al., 2007) shows a total required sample size of at least 295 for the RT task and at least 229 for the free recall task. To allow shrinkage of about 10%, we planned to obtain at least 324 usable data sets. Finally, 359 participants completed the study. Twelve participants had to be excluded due to obvious ignorance of instructions (production of nonsense texts or obvious inattentiveness during the RT task), leaving 347 participants for statistical analyses ($M_{age} = 29.8$ years, $SD = 11.4$, range: 19–68; 255 female, 91 male, one with other gender identity).

Materials and Procedure

The study followed the same procedures as Study 2, with the following modifications: First, the double manipulation of commonality ("pictures and feedback") was replaced by a standard SIB condition without commonality manipulation. Second, half of the participants did not communicate with their audience about the target person Michael about whom the audience's attitude was known (as in Studies 1 and 2), but instead engaged in target-unrelated communication with their audience about U.S. President Joe Biden. This person was selected because it could be presumed to be a generally known person but not the target about whom the audience's attitude was known.

All participants were initially informed that they would participate in a study on "person perception and communication" and were introduced to Jan as their communication partner in the same way as in Studies 1 and 2. They then read the text about the target person Michael and were informed about the audience's attitude toward Michael. However, participants in the condition of target-unrelated communication then received the information that they would be randomly assigned to one of two conditions, one in which they would communicate about Michael with their interaction audience partner Jan, or one in which they would communicate with Jan about a celebrity. They were then informed that they were assigned to the second condition, and that the celebrity they would communicate about would be Joe Biden.

To match the procedure with the target-related communication condition, participants were asked to describe Joe Biden for Jan in such a way that he could be able to identify him. In order to standardize the content of the text messages as much as possible and to ensure that neither Joe Biden's name nor other clearly person-defining information was written, participants were instructed to give only information about the celebrity to be identified (i.e., Joe Biden in this case) with regard to the following five aspects: nationality; societal field, in which the celebrity is particularly relevant (culture, science, sports, politics); approximate age; approximate year when the person became famous in Germany; and current extent of public awareness regarding this person in Germany. Instructions emphasized that no other information should be given. When in the "feedback" condition, the communication partner's subsequent alleged message indicating successful person identification read when Joe Biden has been described (translated from German): "The description clearly applies best to US President Joe Biden. Am I right?" Because of the predetermined content of the message descriptions that participants produced about Joe Biden, these texts were not rated for their valence.

Following the communication with their audience, all participants performed the RT task and the free recall task as in Studies 1 and 2 (always referring to the target person Michael, regardless of whether the participant previously had produced a message about Michael or about Joe Biden for the audience), and finally filled out the questionnaires on perceived shared reality, epistemic trust, and relational motivation (Schmalbach et al., 2019).

Results

Effects of Positive Versus Negative Audience Attitude

For both trait items and behavioral items in the RT task, a mixed $2 \times 3 \times 2 \times 2$ ANOVA was performed with the between-subjects factors Audience Attitude (positive vs. negative), Commonality Manipulation ("pictures," "feedback," and "standard"), Type of Communication (target-related = communication about Michael vs. target-unrelated = communication about Biden), and the within-subjects factor Item Valence (positive items vs. negative items). The number of participants in the 12 different experimental groups formed by the combination of the three between-subject factors ranged between 27 and 30 in the final sample.

As in Study 2, we first describe the results independent of the commonality manipulation. Table 8 shows the respective means for RTs in the RT task and for text valences of message and recall, overall and separately for the two types of communication. As expected, the interaction between item valence and audience attitude for trait items in the RT task was again highly significant, both overall, $F(1, 335) = 8.56$, $p = .004$, $\eta_p^2 = .025$, and when, as in Studies 1 and 2, only participants with target-related communication were considered, $F(1, 168) = 5.94$, $p = .016$, $\eta_p^2 = .034$. The effect reached marginal significance for participants with target-unrelated communication about Joe Biden, $F(1, 167) = 2.87$, $p = .092$, $\eta_p^2 = .017$, indicating that it also contributed to the overall effect. A nonsignificant Item Valence × Audience Attitude × Type of Communication confirmed this, $F(1, 335) = 0.31$, $p = .58$. The overall audience-congruence effect on RTs for trait information in Study 3 (RT difference between incongruent and congruent conditions regardless of positive vs. negative audience attitude) is visualized in the right panel of Figure 1.

Regarding text valence, interrater correlations were $r = .93$ for message ratings and $r = .86$ for recall ratings. For recall valence, a $2 \times 3 \times 2$ between-subjects ANOVA was performed with the independent variables Audience Attitude (positive vs. negative), Commonality Manipulation ("pictures," "feedback," and "standard"), and Type of Communication (target-related vs. target-unrelated). As noted, message valence was not determined for the texts about Joe Biden because the content of these texts was predetermined by instructions. Therefore, the factor Type of Communication was not included in the analysis of message valence.

Again, an additional explorative analysis was also performed for the behavioral items in the RT task. In contrast to Studies 1 and 2, the interaction between item valence and audience attitude was significant for these items, with the same pattern of means as for trait items, $F(1, 335) = 5.06$, $p = .025$, $\eta_p^2 = .015$. A nonsignificant Item Valence × Audience Attitude × Type of Communication indicated that the effect did not differ between communication conditions, $F(1, 335) = 0.86$, $p = .36$. When the two communication conditions were considered separately, the Item Valence × Audience Attitude interaction for behavioral items reached significance only for target-unrelated communication, $F(1, 167) = 4.40$, $p = .038$, $\eta_p^2 = .026$, but not for target-related communication, $F(1, 168) = 1.02$, $p = .31$, $\eta_p^2 = .006$.

As in the previous studies, message tuning was highly significant, main effect of audience attitude for message valence, $F(1, 168) = 48.30$, $p < .001$, $\eta_p^2 = .223$. The results for the audience-congruent recall bias mirrored the RT effects on trait information, showing a significant audience attitude effect overall, $F(1, 335) = 8.54$, $p = .004$, $\eta_p^2 = .025$, and when, as in the previous studies, only participants with target-related communication were considered, $F(1, 168) = 12.27$, $p < .001$, $\eta_p^2 = .068$. The effect did not reach significance with target-unrelated communication about Joe Biden, $F(1, 167) = 2.87$, $p = .092$, $\eta_p^2 = .017$, but this condition still contributed to the overall audience attitude effect, as indicated by a nonsignificant Audience Attitude × Type of Communication, $F(1, 335) = 1.49$, $p = .22$, $\eta_p^2 = .004$.

Unexpectedly, in none of the analyses of RTs or text valence, the commonality manipulation exerted any statistically significant effects, neither as a main effect nor in interaction with other factors. Means of RTs and text valence are shown separately for the three commonality conditions in Table 9 (for target-related communication) and Table 10 (for target-unrelated communication).

Correlation Analyses

The correlations of the different audience attitude effects with each other and with the questionnaires related to shared reality are shown in Tables 11 and 12, respectively. All correlations again had a numerically positive sign. Critically, the magnitude of the audience attitude effect on RTs for trait information correlated significantly with the audience-congruent recall bias ($r = .18$, $p = .001$). As in Studies 1 and 2, it also correlated significantly with perceived shared reality with and epistemic trust in the audience. In addition, its correlation with relational motivation reached significance.

Discussion

The aim of Study 3 was to extend and replicate audience attitude effects on accessibility of audience-congruent information from

Table 8

Means of RTs, Message Valence, and Recall Valence in the Positive Versus Negative Audience Attitude Condition in Study 3, Collapsed Across All Commonality Manipulation Conditions

Outcome variable	Positive audience attitude	Negative audience attitude	*p* value for pairwise comparisons
	RT task: RTs (ms)		
Traits—positive items			
Overall	1,373 (415)	1,421 (470)	.32
Communication about target	1,396 (393)	1,392 (389)	.94
Communication about Biden	1,350 (437)	1,449 (539)	.18
Traits—negative items			
Overall	1,445 (456)	1,380 (492)	.20
Communication about target	1,449 (427)	1,310 (402)	.028*
Communication about Biden	1,441 (486)	1,448 (560)	.93
Traits—diff. pos.–neg. items			
Overall	**−72 (368)**	**41 (355)**	**.004****
Communication about target	**−53 (372)**	**82 (355)**	**.016***
Communication about Biden	**−92 (364)**	**1 (352)**	**.09**
Behavior—positive items			
Overall	2,018 (637)	2,034 (638)	.82
Communication about target	2,021 (652)	1,956 (506)	.46
Communication about Biden	2,015 (624)	2,111 (741)	.36
Behavior—negative items			
Overall	2,097 (665)	2,016 (597)	.23
Communication about target	2,084 (638)	1,962 (529)	.17
Communication about Biden	2,109 (695)	2,069 (656)	.69
Behavior—diff. pos.–neg. items			
Overall	−79 (362)	18 (433)	.025*
Communication about target	−63 (360)	−6 (382)	.31
Communication about Biden	−95 (367)	42 (479)	.037*
	Text valence		
Message			
Overall			
Communication about target	0.83 (1.46)	−0.98 (1.93)	<.001*
Communication about Biden	—	—	
Recall			
Overall	**0.08 (1.28)**	**−0.32 (1.21)**	**.004****
Communication about target	**0.25 (0.95)**	**−0.31 (1.12)**	**.001****
Communication about Biden	**−0.10 (1.53)**	**−0.33 (1.30)**	**.29**

Note. Numbers in parentheses indicate standard deviations. Values in bold refer to hypotheses. RT = reaction time; diff. pos.–neg. = difference between positive and negative items.
* $p < .05$. ** $p < .01$.

Studies 1 and 2, employing experimental manipulations that might affect experienced shared reality with the audience and, thus, the accessibility bias. However, accessibility bias was not enhanced by conditions in which the audience ostensibly exhibited similar judgments of pictures of ambiguous social situations or provided verification feedback of the audience's message. Also, by and large, target-unrelated communication with the audience did not reduce the bias. Still, the overall results demonstrated the intended replications. Critically, RTs for audience-congruent trait information were faster than for audience-incongruent trait information, indicating higher cognitive accessibility. Also, the magnitude of this RT advantage (i.e., the audience-congruent accessibility bias) correlated significantly with the established audience-congruent recall bias. In addition, replicating the findings from both Study 1 and Study 2, the audience-congruent accessibility bias correlated significantly with both experienced shared reality with the audience and epistemic trust in the audience.

Together, these findings establish audience-attitude-dependent RT differences in the processing of target-related trait information as a new indicator of shared reality creation, which reveals selective information accessibility as a cognitive mechanism component of motivational effects related to truth relevance (Eitam & Higgins, 2010; Eitam et al., 2013).

Supplementary Control Analyses Across Experiments

We performed supplementary control analyses across the three experiments. The first analysis disentangled "yes" versus "no" responses in the RT task. Overall, "yes" responses predominated across all traits (Experiment 1: 75.5%; Experiment 2: 74.9%; and Experiment 3: 73.0%; $p < .001$, for difference from chance level 50% in all experiments). This overall acquiescence bias presumably results from the fact that the original target passages were evaluatively ambiguous and were thus amenable to both positive and negative inferences. In other words, all trait items represented plausible inferences from the original text about the target person. We performed the main analyses for each experiment using the proportion of "yes" responses as a dependent variable rather than reaction times. The pattern was consistent with the main thrust of our studies: The

Table 9

Means of RTs, Message Valence, and Recall Valence in the Positive Versus Negative Audience Attitude Condition in Study 3 for Participants With Target-Related Communication (Communication About Michael), Separately for the Three Different Commonality Manipulation Conditions

Outcome variable	Positive audience attitude	Negative audience attitude	*p* value for pairwise comparisons
	RT task: RTs (ms)		
Traits—positive items			
Pictures	1,393 (393)	1,302 (301)	.33
Feedback	1,457 (452)	1,409 (418)	.67
Standard (baseline)	1,340 (331)	1,469 (433)	.21
Traits—negative items			
Pictures	1,505 (432)	1,294 (339)	.042*
Feedback	1,468 (327)	1,274 (421)	.055
Standard (baseline)	1,376 (503)	1,367 (451)	.94
Traits—diff. pos.–neg. items			
Pictures	−111 (249)	9 (274)	.15
Feedback	−11 (379)	135 (350)	.13
Standard (baseline)	−36 (394)	103 (430)	.21
Behavior—positive items			
Pictures	2,100 (738)	1,868 (442)	.15
Feedback	2,099 (694)	2,009 (558)	.59
Standard (baseline)	1,866 (494)	1,992 (517)	.35
Behavior—negative items			
Pictures	2,097 (689)	1,915 (482)	.25
Feedback	2,181 (623)	1,954 (582)	.16
Standard (baseline)	1,979 (604)	2,020 (532)	.79
Behavior—diff. pos.–neg. items			
Pictures	3 (332)	−47 (424)	.62
Feedback	−81 (389)	54 (305)	.14
Standard (baseline)	−113 (361)	−27 (415)	.41
	Text valence		
Message			
Pictures	0.75 (1.56)	−0.60 (2.12)	.007**
Feedback	0.76 (1.51)	−1.09 (1.92)	<.001**
Standard (baseline)	0.97 (1.34)	−1.26 (1.73)	<.001**
Recall			
Pictures	0.18 (1.13)	−0.31 (1.12)	.098
Feedback	0.36 (0.79)	−0.24 (1.01)	.014*
Standard (baseline)	0.20 (0.91)	−0.37 (1.27)	.054

Note. Numbers in parentheses indicate standard deviations. RT = reaction time; diff. pos.–neg. = difference between positive and negative items.
* $p < .05$. ** $p < .01$.

proportion of "yes" responses was lower for audience-incongruent (on average 71.5% in Experiment 1, 69.4% in Experiment 2, and 68.7% in Experiment 3) than for audience-congruent items (on average 79.4% in Experiment 1, 80.4% in Experiment 2, and 77.2% in Experiment 3; $p < .001$, for difference between incongruent and congruent conditions in all cases). Thus, audience's attitude also affected the explicit trait judgments of the target person (see Tables S1a, S1b, and S1c in the online supplemental materials for complete data; the only basic difference to the analyses on RTs was that the same statistical pattern as for trait judgments was also observed in the additional explorative analysis on behavioral judgments).

Because we found fewer audience-incongruent responses (i.e., "no" responses for trait items inconsistent with the audience's attitude), we further examined whether the audience-congruent accessibility bias was merely driven by longer RTs for "no" (vs. "yes") responses. Typically, "no" responses in speeded decision tasks like the present one take more time than do "yes" responses, as confirmed in our current data (with an overall average of 1,680 ms for "no" responses and 1,390 ms for "yes" responses, $p < .001$). This difference, however, does not challenge the results from our main analysis. Importantly, in all three experiments, the same pattern of RT results as in the main analysis was likewise obtained when only RTs for "yes" answers were considered (see Tables S2a, S2b, and S2c in the online supplemental materials). (It was not feasible to run the separate analyses also for "no" responses because the number of "no" responses was too low to allow sound estimates: As noted, "yes" answers strongly dominated, leaving on average less than 2.5 items per condition for "no" answers, a number that was further reduced by outlier elimination.) Thus, accessibility effects in the RT task could not be explained simply by differential proportions of specific decision outcomes across experimental conditions, because they were still present even when their outcome (the explicit answer) was held constant (see Ditto & Lopez, 1992, for a similar rationale in studies on motivational influences on active information search).

Table 10

Means of RTs and Recall Valence in the Positive Versus Negative Audience Attitude Condition in Study 3 for Participants With Target-Unrelated Communication (Communication About Joe Biden), Separately for the Three Different Commonality Manipulation Conditions

Outcome variable	Positive audience attitude	Negative audience attitude	*p* value for pairwise comparisons
	RT task: RTs (ms)		
Traits—positive items			
Pictures	1,316 (387)	1,445 (591)	.33
Feedback	1,370 (440)	1,369 (333)	.99
Standard (baseline)	1,364 (494)	1,544 (658)	.26
Traits—negative items			
Pictures	1,474 (517)	1,344 (523)	.35
Feedback	1,425 (468)	1,423 (461)	.98
Standard (baseline)	1,424 (487)	1,589 (679)	.30
Traits—diff. pos.–neg. items			
Pictures	−159 (348)	100 (237)	.002**
Feedback	−56 (348)	−53 (313)	.98
Standard (baseline)	−60 (400)	−45 (467)	.90
Behavior—positive items			
Pictures	1,999 (581)	2,101 (917)	.61
Feedback	2,022 (644)	2,011 (553)	.94
Standard (baseline)	2,024 (666)	2,232 (722)	.27
Behavior—negative items			
Pictures	2,142 (741)	2,045 (776)	.63
Feedback	2,117 (641)	2,017 (608)	.54
Standard (baseline)	2,069 (724)	2,152 (581)	.64
Behavior—diff. pos.–neg. items			
Pictures	−143 (340)	56 (317)	.025*
Feedback	−95 (404)	−7 (407)	.40
Standard (baseline)	−44 (360)	80 (673)	.40
	Text valence		
Message			
Pictures	—	—	
Feedback	—	—	
Standard (baseline)	—	—	
Recall			
Pictures	0.19 (1.31)	−0.45 (1.32)	.069
Feedback	−0.38 (1.47)	−0.32 (1.40)	.86
Standard (baseline)	−0.09 (1.80)	−0.20 (1.18)	.78

Note. Numbers in parentheses indicate standard deviations. Text messages were not rated for valence because their content was predetermined by instruction for target-unrelated communication (see Method section). RT = reaction time; diff. pos.–neg. = difference between positive and negative items.
* $p < .05$. ** $p < .01$.

In another control analysis, we examined the possibility of priming effects as an explanation for the RT results: When participants mention the trait words from the RT task in their own message, RTs for these words might be faster in the subsequent RT task. In this case, enhanced accessibility in the subsequent RT task could be explained by mere priming due to the previous activation of these words rather than by congruence with the audience's attitude per se. However, the number of trait words that were (a) presented in the RT task and (b) previously mentioned in messages did not correlate with audience-congruent accessibility bias in any of the experiments (Experiment 1: $r = -.127$, $p = .104$; Experiment 2: $r = -.064$, $p = .443$; and Experiment 3: $r = .028$, $p = .718$).

Finally, we additionally performed summary analyses collapsing the data for RTs and free recall valence from all three studies into one data set (which was possible because the dependent variables were identical across studies). Such summary analyses allowed us to gauge the robustness of the main findings when all data were pooled into one sample ($N = 656$ for RT data, $N = 801$ for free recall data). Results confirmed this robustness across the different studies (see Tables S3a, S3b, and S3c in the online supplemental materials): The audience attitude effect emerged both in trait-item RTs ($p < .001$, $\eta_p^2 = .04$) and in free recall ($p < .001$, $d = 0.25$), and the two measures correlated positively ($r = .15$, $p < .001$). Both the audience-congruent accessibility bias and the recall bias also correlated positively with subjectively perceived shared reality and with epistemic trust in the communication partner. As in the individual experiments, the correlations of the biases with measures of relational motivation were lower, but they also reached significance in this combined analysis (except for the correlation of the recall bias with IOS).

Moreover, an explorative question was whether the RT effects would be significant also for behavioral items with the combined power of the three studies. This was not the case ($p = .22$, $\eta_p^2 = .002$; Table S3a in the online supplemental materials). However, as in the single studies, the results on the behavioral level generally followed the same pattern as for the trait level (although weaker), and all correlations of interest

Table 11
Intercorrelations Between the Different AAEs in Study 3

Outcome variable	*r*/*p* value	AAE-RT traits	AAE-RT behavior	AAE message	AAE recall
AAE-RT traits	*r*	—			
	p				
AAE-RT behavior	*r*	.14*	—		
	p	.009			
AAE message (audience tuning)	*r*	.35**	.22**	—	
	p	<.001	.004		
AAE recall (recall bias)	*r*	**. 18****	.12*	.23**	—
	p	**.001**	.026	.002	

Note. $N = 347$ (except for correlation between AAE message and AAE recall, which is based on $N = 174$). Values in bold refer to hypotheses. AAE = audience attitude effect; RT = reaction time task.
* $p < .05$. ** $p < .01$.

were likewise positive and mostly reached significance (Tables S3b and S3c in the online supplemental materials).

The critical ANOVAs in the summary analysis were further performed with an additional between-subjects factor "Study" (with the factor levels Study 1, Study 2, and Study 3), to explore whether the overall findings were specifically driven by the results from a particular study. This was not the case, that is, the extent of the audience attitude effects did not differ significantly between studies ($ps > .20$, $\eta_p^2 < .005$ for interactions with the factor "Study").

General Discussion

The ROAR model (Eitam & Higgins, 2010; Eitam et al., 2013) proposes motivationally driven cognitive accessibility as a general mechanism of motivation-cognition interaction, including motivated remembering. Using an RT task to assess cognitive accessibility, three studies found empirical evidence supporting this model with regard to the socially motivated memory bias that is typically found in the classical SIB paradigm (Echterhoff et al., 2005; Higgins & Rholes, 1978). After communicators had received information about their audience's attitude toward a target person and tuned their message to match this attitude, they reacted faster to target information that was congruent to the audience's attitude than to audience-incongruent information. As predicted, this effect was more robustly found for trait information rather than for behavioral information about the target. This finding is consistent with classical research on spontaneous trait inferences: People are inclined to spontaneously form trait interpretations of other people's behaviors such that their mental representations of other persons are primarily coded at the trait level than at the level of concrete behaviors (Srull & Wyer, 1989; Uleman et al, 1996).

As predicted, the audience-congruent accessibility bias (faster RTs for audience-congruent vs. audience-incongruent trait information) was also overall positively correlated with the subsequent audience-congruent recall bias, consistent with the proposal that differential cognitive accessibility is the underlying mechanism for the memory bias. The size of the correlation, however, was relatively small ($r < .20$ in all studies), and failed to reach significance in Study 2. As a possible explanation, Study 2 also found that the classical memory bias in the free recall task was only obtained if there was no previous RT task to assess cognitive accessibility. This indicates that the intermittent administration of the RT task itself attenuates the classical audience-congruent recall bias. Hence, the direct correlation between the two measures probably underestimates the real association. Nevertheless, our overall summary analysis confirms that this positive correlation is a valid and robust finding when data from all three studies were pooled.

Our findings show that motivational influences related to shared reality affect cognition already at very early stages of processes that are not under conscious control. The RT measure of accessibility was specifically designed to address these very early stages of cognitive processing. Classical free recall, as a direct and explicit memory

Table 12
Correlations Between the Different AAEs With Questionnaires Targeting Subjective Experiences Related to Shared Reality in Study 3

Outcome variable	*r*/*p* value	SRT	Epistemic trust	Relational motivation	IOS
AAE-RT traits	*r*	.26**	.18**	.16*	.10
	p	<.001	.001	.003	.06
AAE-RT behavior	*r*	.13*	.11*	.01	.05
	p	.014	.034	.86	.38
AAE message (audience tuning)	*r*	.27**	.23**	.13	.20*
	p	<.001	.002	.089	.010
AAE recall (recall bias)	*r*	.22**	.10	.05	.09
	p	<.001	.058	.40	.080

Note. $N = 347$ (except for AAE for Message, which is based on $N = 174$). SRT = shared reality about a target (Schmalbach et al., 2019); IOS = inclusion of other in the self (Aron et al., 1992); AAE = audience attitude effect; RT = reaction time task.
* $p < .05$. ** $p < .01$.

task without time restrictions, is conflated with a variety of additional controlled or conscious processes, and therefore does not serve as a valid measure of accessibility per se. The positive correlation between the audience attitude biases on the level of accessibility (as revealed by the RT task) and on the level of free recall indicates that the effect on the early cognitive stages critically impact the later processes of memory retrieval that are also under strategic control. The fact that the size of this correlation is not high numerically does not come as surprise, given that free recall is additionally driven by many additional cognitive processes apart from accessibility.

Our current approach is reminiscent of classical findings on biased hypothesis testing (Snyder & Cantor, 1979). In the study by Snyder and Cantor (1979), participants first read a multipage description of a person called Jane, which contained equal amounts of events indicating introverted and extraverted characteristics. Two days later, participants were asked to judge how well Jane was suited for a specific job, either a real estate salesperson (requiring personal attributes of a prototypic extravert) or a research librarian (requiring personal attributes of a prototypic introvert). For this purpose, they were asked to use the information that they had previously learned about Jane and to write down all the information that they considered relevant to assessing Jane's vocational suitability. Participants listed more hypothesis-confirming than hypothesis-disconfirming information about the target person, that is, more information describing Jane as introverted rather than extraverted in the "research librarian" condition, and vice versa in the "real estate salesperson" condition. Furthermore, the extent to which participants reported more confirming than disconfirming information correlated with their subsequent judgment of how well the target person was suited for the job.

Snyder and Cantor's (1979) studies of hypothesis confirmation and the SIB paradigm as used here document motivationally biased evaluations of a target person. Both paradigms tap the formation of judgments about an unfamiliar target. However, there are significant differences. The confirmatory information bias as described by Snyder and Cantor (1979) is driven by the motivation to find supportive evidence for a given hypothesis. In contrast, the audience-congruent biases in the SIB paradigm concern the evaluative alignment of one's communication and subsequent memory to the judgment of a communication partner. Previous findings suggest that the evaluative memory bias in the SIB paradigm cannot be explained by information selection biased toward a hypothesis based on the audience's attitude (Echterhoff et al., 2008, 2009). This is because the audience-congruent memory bias has been reduced by manipulations that do not discredit or invalidate the audience's judgment (e.g., lack of actual message production while still knowing the audience's attitude; Echterhoff et al., 2017; Higgins & Rholes, 1978; erroneous message delivery to a different audience; Echterhoff et al., 2013). If confirmatory testing of a hypothesis provided by the audience was sufficient for the audience-congruent memory bias, then such manipulations would not reduce the bias. Rather, the extant body of findings supports the view that the audience-congruent memory bias reflects the communicators' creation of shared reality with the audience (Echterhoff & Higgins, 2017, 2021; Higgins et al., 2021).

Another difference lies in the memory measure. Participants in the studies by Snyder and Cantor (1979) had to list information that they regarded as relevant for the suitability judgment. Indeed, the studies were not designed in ways that would allow the researchers to examine whether the confirmatory bias is based on biased memory retrieval or on simply biased perceptions of the relevance of, already retrieved, confirming versus disconfirming evidence (see Snyder & Cantor, 1979, p. 341). In SIB studies, however, participants are explicitly asked to recall all the information they read about the target person. Our novel RT task reveals underlying differences in the cognitive accessibility of audience-congruent (vs. audience-incongruent) target information. Future research could employ such an accessibility measure for the hypothesis-confirmation bias to test whether the effect is grounded in differential accessibility of hypothesis-congruent than hypothesis-incongruent information.

Processes of hypothesis testing may also play a role in the explicit responses in the present RT task. Sharing with their audience the positive or negative attitude about the target person, participants could spontaneously test for each item whether that information is audience congruent. Indeed, our supplementary analyses for explicit responses on the RT task are consistent with some notion of confirmation bias: The percentage of "yes" answers was higher for audience-congruent than for audience-incongruent items in the RT task. This finding, however, cannot explain the present audience-congruent accessibility bias, indicated by the RT difference between audience-congruent and audience-incongruent items. This is because this RT bias also occurred when only "yes" answers were considered; that is, when the explicit response on the task was held constant.

Together, our findings extend previous research on motivated remembering, which has mainly focused on self-serving memory biases in self-related memories; that is, biases in episodic or autobiographical memories of own past experiences or behaviors that help individuals to maintain a positive self-image (Dunning et al., 1991; Sanitioso et al., 1990; Sedikides et al., 2016). This research found evidence for enhanced cognitive accessibility of self-serving information, which is consistent with the predictions from the ROAR model (Sanitioso et al., 1990, Study 3; Dunning et al., 1991, Study 5).

Our results extend these findings in two important ways. First, they demonstrate the mechanism of motivation-dependent cognitive accessibility for the first time within a setting that does not specifically refer to self-related memory processes. This is an important extension because self-related memory processing can be guided by specific mechanisms that may not apply more generally (e.g., Symons & Johnson, 1997). Second, our studies focused on a different type of motivation. Among the three major types of motivational sources, that is, value, truth, and control (Eitam & Higgins, 2010), truth motivation plays a pivotal role in the shared-reality theory (Echterhoff & Higgins, 2021; Higgins, 2012, 2019a). Many previous studies using the SIB paradigm have shown that the evaluative recall bias that is observed in this paradigm is driven by the epistemic motivation to obtain knowledge of the "truth" about the target, achieved by shared reality creation with a trustworthy partner (Echterhoff et al., 2005). As such, this paradigm is particularly suitable to tap truth motivation. Of course, this does not mean that the motivational dynamics of shared reality are completely restricted to truth motivation, because when people create a shared reality about a target, they not only achieve epistemic, truth-related needs but, in so doing, they typically also achieve other needs, such as needs for connectedness, affiliation, mastery, and control (see Echterhoff & Higgins, 2021; Higgins, 2019b).

The association of cognitive accessibility with truth-related motivation in our paradigm is further supported by our additional exploratory measures, two of which assessed truth-related motives (SRT, Epistemic Trust), while the other two measures assessed interpersonal relationship motives (Relational Motivation, IOS). In all

three experiments, the audience attitude effect on cognitive accessibility (RT advantage for audience-congruent trait information) significantly correlated with SRT and with Epistemic Trust, but not with Relational Motivation or IOS. In all cases, the two truth-related motives appeared to be even more strongly associated with the audience attitude effect in cognitive accessibility than with the audience-congruent recall bias. As discussed earlier, however, these differential associations need to be interpreted with caution because of the negative influence of the measurement of cognitive accessibility through the RT task on the subsequent classical memory bias. Moreover, we found that the weaker correlation of the accessibility bias with relational motivation reached significance in our summary analysis, in which participants from all three studies were included.

It should also be noted that our commonality manipulations introduced in Studies 2 and 3 did not produce the expected results. In particular, the commonality manipulation in Study 3 did not exert any effect, and in Study 2, it had effects that are difficult to interpret. As expected, audience attitude effects on cognitive accessibility were actually stronger in the combined commonality manipulation ("pictures and feedback") than in the single-commonality manipulations ("pictures" alone or "feedback" alone). However, this was not the case for the audience-congruent recall bias, where the combined manipulation appeared to be, if anything, even weaker than the single manipulations. Again, the negative influence of the inclusion of the RT task per se on the subsequent measurement of the recall bias may partly play a role here.

Overall, these findings suggest that, in standard communication contexts, there is already a strong natural inclination of people to establish a shared reality with a communication partner, even in the absence of facilitating factors. This view is consistent with the fundamental role of shared reality in the formation of judgments, beliefs, and evaluative representations (Echterhoff & Higgins, 2021; Higgins, 2019a). We thus suspect that spontaneous shared-reality motivation cannot be easily strengthened by additional commonality interventions, at least not by those used in the present research.

Regarding the type of communication additionally manipulated in Study 3 (target-related communication about Michael vs. target-unrelated communication about Joe Biden), we found some evidence that the type of communication plays a role because the expected audience attitude effects became significant only for target-related communication. There was no significant interaction with the factor Type of Communication, however, suggesting that target-unrelated communication does not completely eliminate the audience-congruent recall bias. Previous studies on the role of message production in the SIB paradigm compared the standard condition (target-related message production) with a condition where no message to the audience was produced at all (Echterhoff et al., 2017; Higgins & Rholes, 1978; Higgins et al., 2007). When no message was produced, the audience-congruent recall bias did not emerge.

Our present findings seem to indicate that communication, even if not related to the target about whom the audience ostensibly has an attitude, can contribute to shared reality creation to some extent, at least when it concerns a widely known political figure. This suggests that the motivation to create a shared reality appears to be less dependent on the specific communication topic than we had expected. More general features of interpersonal communication, regardless of the specific communication topic, might play a role here, such as joint attention and establishing common reference (even if only imagined in this case). Cognitive accessibility could be further strengthened or supported by (actually experienced or imagined) shared attention to the target and/or the evaluation of the target (Shteynberg, 2010; Shteynberg & Galinsky, 2011). Future research should employ targets with different features (similarity to main target, familiarity, personal relevance) to further specify how different communication targets can differently affect audience attitude effects in the SIB paradigm. Corresponding studies should also investigate the possible supporting role of additional mechanisms (e.g., those related to shared attention) for different targets. All in all, the present studies reveal a new facet of communication effects on memory, and illuminate the interplay of cognitive and motivational processes. Our research is consistent with the notion that epistemic motivation and the interpersonal context profoundly condition the way in which social perceivers construct memories of past events. Specifically, the achievement of motivational truth relevance via shared reality harnesses spontaneous, basic cognitive mechanisms that facilitate the retrieval of evaluatively biased information about a target person that is not part of the originally presented material.

Constraints on Generality

Across three studies, we find that trait information (inferred semantic information about a target) that is conducive to achieving a shared reality with a communication partner is spontaneously more cognitively accessible than information that is not. This motivationally enhanced cognitive accessibility predicts the extent of the well-documented recall bias known as the "saying-is-believing" or "sharing-is-believing" effect. We obtained our results within a specific experimental context with specific materials. Generalizations to other contexts and materials await further investigation. For example, all studies were performed as online studies, that is, in a relatively minimalistic and artificial experimental context. However, we would expect even stronger effects in situations of natural communication, provided that the same level of experimental control could be reached.

Another issue refers to possible generalizations to other populations. All our studies were performed with speakers sufficiently proficient in German. Due to online recruitment and participation, our samples comprised participants with a wide range of age and professions and were therefore more heterogenous than in typical previous studies that often included only students from a specific university. We believe that our results are at least applicable to the German adult population, and we have no reason to assume that they are not similarly generalizable to other Western or non-Western populations.

At a broader level, our central findings already represent a generalization of extant demonstrations of motivational biases in memory. Relevant previous research so far has focused on only one specific other (value-oriented) motivational domain, that is, self-related motives (Dunning et al., 1991; Sanitioso et al., 1990), which are different from the epistemic and social motives involved in shared reality creation. In fact, we expect that the same basic mechanisms of motivation–cognition interaction that we observe here would apply more generally, regardless of the specific motivational forces.

Conclusion

In sum, our data establish differential information accessibility as a critical determinant of motivated memory performance, even in a domain where neither the primary motivational force nor the memory contents specifically relate to the self. Generally, our findings

resonate well with recent generative conceptualizations of episodic memory retrieval, according to which remembering is not simply a reinstatement of originally encoded information but instead depends on how a "scenario of the past" is (re)constructed at the time of retrieval (Blank, 2009; Cheng et al., 2016), and point to a specific cognitive mechanism critically determining such reconstructive processes. Future research should extend the scope of investigation from target persons to other topics, such as social groups, multifaceted societal issues, or contested policies (for related propositions, see Jost et al., 2008). One particularly promising field of application here could be the communication about and recall of information about anthropogenic climate change. Motivated memory biases have already been documented for this topic, albeit not specifically in the context of shared reality creation (Hennes et al., 2016). It will be exciting to explore whether and how people create shared reality about societally highly relevant topics like this.

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