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Merged Minds: Generalized Shared Reality in Dyadic Relationships

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Many everyday conversations, whether between close partners or strangers interacting for the first time, are about the world external to their relationship, such as music, food, or current events. Yet, the focus of most research on interpersonal relationships to date has been on the ways in which partners perceive each other and their relationship. We propose that one critical aspect of interpersonal interactions is developing a sense of dyadic, *generalized shared reality*—the subjective experience of sharing a set of inner states (e.g., thoughts, feelings, or beliefs) in common with a particular interaction partner about the world in general, including the world external to the relationship. Across 9 studies, we use mixed methods to investigate the unique role of generalized shared reality in interpersonal interactions, both between close partners and strangers. We hypothesize that generalized shared reality predicts how people connect with each other and perceive the world around them. We also investigate the observable, dyadic behavioral signatures of generalized shared reality in interpersonal interactions. Finally, we examine the motivation to uphold an existing sense of generalized shared reality. We hypothesize that couples high on baseline generalized shared reality exhibit motivated, dyadic interaction behaviors to reaffirm their generalized shared reality in the face of experimentally manipulated threat. By identifying a unique dimension of everyday interactions, these studies aim to capture a critical aspect of the lived subjective experience of human relationships that has not been captured before.

Keywords: conversation, dyadic relationships, interpersonal relationships, shared reality

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> Looking back, our way of living seems a miracle, one that could only be achieved by the silent synchronization of the gears of a common mind.
>
> —Patti Smith, 2016

> What draws people to be friends is that they see the same truth. They share it.
>
> —C. S. Lewis, 1960

Many everyday conversations, whether between close partners or strangers interacting for the first time, are about the world external to their relationship—for example, about music, food, or current events (Alberts, Yoshimura, Rabby, & Loschiavo, 2005; Woods, Lakey, & Sain, 2016). And yet, as put forward by Clark, Graham, Williams, and Lemay (2008), relationships research to date has focused primarily on the ways in which partners perceive each other and their relationship rather than the ways in which they jointly perceive the external world. We propose that in interpersonal interactions, whether with close partners or strangers, people often develop and uphold the sense that they see the world in the same way as the other person. They may find themselves thinking of things at the same time, developing a joint perspective, or in the words of Patti Smith, feeling that they share a common mind. We examine this experience through the lens of shared reality theory. We introduce the concept of dyadic, *generalized shared reality*—the experience of sharing a set of inner states (e.g., thoughts, feelings, or beliefs) in common with a particular interaction partner about the world in general.

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Data and code for all studies in this article can be found on OSF. (https://osf.io/yxq4c/?)

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In this article, we investigate the unique role of generalized shared reality in interpersonal interactions, both between close partners and strangers. We hypothesize that experiencing a sense of generalized shared reality with another person predicts both the feeling of connecting with that person, such as closeness and "clicking", and the sense of establishing certainty about one's perceptions of the world. We also investigate the observable, dyadic behavioral signatures of generalized shared reality in interpersonal interactions. Finally, we examine the motivation to uphold an existing sense of shared reality by experimentally challenging couples' beliefs that they experience the sensory world in the same way. We hypothesize that couples who are higher on generalized shared reality will exhibit motivated interaction behaviors to reaffirm their generalized shared reality in the face of this threat.

In the spirit of early relationship researchers such as Berscheid (1995) and Kenny (1995), who voiced the importance of studying everyday interactions and conversations, we aim to examine generalized shared reality in diverse, ecologically grounded contexts that reflect the construction of generalized shared reality in the real world. We examine generalized shared reality as both a chronic, cross-situational feature of close relationships (Studies 1a–1d and 4) and as a state-like, situational feature of a given interaction or on a given day (Studies 2a–2c, 3, and 4). We measure generalized shared reality using self-report (Studies 1–4), behavioral coding (Studies 3–4), and computational linguistic analyses (Study 4). Further, we examine generalized shared reality in daily life (Studies 2a–2c) and in real-time dyadic conversation contexts about ordinary objects (Studies 3 and 4). By identifying a novel dimension of everyday interactions, these studies aim to capture a critical aspect of the lived subjective experience of human relationships that has not been captured before.

Shared Reality Theory

Shared reality is defined as the perceived commonality of inner states (e.g., feelings, beliefs or concerns) with another person about a target referent (e.g., an event, an object, or a third person; Echterhoff, Higgins, & Levine, 2009; Hardin & Higgins, 1996; Higgins, 2019). According to Echterhoff, Higgins, and Levine (2009), people are driven to create shared realities to satisfy both *relational* motives—a desire for interpersonal connection (Baumeister & Leary, 1995; Gere & MacDonald, 2010), and *epistemic* motives—a motivation to understand one's experiences and establish a sense of truth and certainty (Higgins, 2012; Kruglanski, 1990). For example, if two people share the same interpretation of an event, shared reality theory proposes that discussing this shared interpretation would both enhance their connection to one another and serve to confirm their understandings of what really happened during that event. Research supports the idea that both of these motives drive shared reality: people are more likely to create shared realities with individuals with whom they are motivated to connect, such as ingroup members (Echterhoff, Higgins, & Groll, 2005; Echterhoff, Lang, Krämer, & Higgins, 2009; Echterhoff, Kopietz, & Higgins, 2013; Sinclair, Lowery, Hardin, & Colangelo, 2005; Skorinko & Sinclair, 2018), and about targets they are uncertain about, such as ambiguous stimuli (Echterhoff & Higgins, 2017; Kopietz, Hellmann, Higgins, & Echterhoff, 2010; Pierucci, Echterhoff, Marchal, & Klein, 2014). This work has shown that humans are motivated to create shared realities to connect with each other and make sense of the world.

To date, shared reality research has been typically constrained to examining shared reality about one target in particular (e.g., a third person or an event). Furthermore, these studies have been primarily conducted using a paradigm in which participants send a single written message to a fictitious partner, without actually conversing (see Echterhoff & Higgins, in press, for a review). Though these constraints afforded greater experimental control, they may have limited our understanding of how shared reality typically manifests in everyday life. Little is known about how shared reality operates in (a) *real-world relationships*—between familiar partners, or even between new acquaintances, and (b) *real-world interactions*—in naturalistic, everyday conversations.

We propose that in real-world contexts, people typically experience shared reality with another person as being about more than a *single* topic or object in particular (e.g., Pink Floyd's *Dark Side of the Moon*). Instead, they usually experience shared reality with an interaction partner about a variety of topics (e.g., music, art, cuisine). In other words, we theorize that people typically experience shared reality with an interaction partner about—as the name suggests—reality at large.

Generalized Shared Reality

Much evidence suggests that both close partners and newly acquainted conversation partners create a shared reality about the world in general. In terms of close partners, Berger and Kellner (1964) initially proposed that through the process of discussing their everyday experiences, close partners "weld together their reality"—their own way of understanding and interpreting the world (p.12). As reviewed by Rossignac-Milon and Higgins (2018b), relationships research suggests that close partners create shared realities about a multitude of targets. Partners frequently discuss the world at large—events, ideas, other people, and various topics outside of their relationship (Alberts et al., 2005; Woods et al., 2016), and converge in their attitudes and emotional responses over time (Acitelli, Kenny, & Weiner, 2001; Anderson, Keltner, & John, 2003; Butler, 2015; Davis & Rusbult, 2001; Gonzaga, Campos, & Bradbury, 2007). They construct shared meaning-systems (Duck, 1994; Przybylinski & Andersen, 2015; Stephen, 1984) and share their values and beliefs (Auger, Hurley, & Lydon, 2016; Leikas, Ilmarinen, Verkasalo, Vartiainen, & Lönnqvist, 2018). They create shared inner states about past events (Harris, Barnier, Sutton, & Keil, 2014; Hirst & Echterhoff, 2012) and about their future (Fitzsimons, Finkel, & vanDellen, 2015). They also seek to establish a shared understanding of their innermost selves (Reis, Lemay, & Finkenauer, 2017; Swann & Brooks, 2012) and of their relationship (Acitelli, 1988; Baxter & Pittman, 2001), and construct a shared identity (Aron, Aron, & Smollan, 1992; Linardatos & Lydon, 2011; Walsh & Neff, 2018).

Further, partners co-construct a relationship subculture composed of ways of thinking, behaving, interacting, and talking that are unique and special to their relationship. For example, partners engage in particular joint activities (Berscheid, Snyder, & Omoto, 2004; Boothby, Smith, Clark, & Bargh, 2017; Girme, Overall, & Faingataa, 2014; Woods et al., 2016), some of which become meaningful traditions (e.g., "We go for a stroll in the park on Sunday mornings"; Garcia-Rada, Sezer, & Norton, 2018). Partic-

ular objects become imbued with dyadic significance (e.g., "our song"; Harris, Baird, Harris, & Thompson, 2019). Through their conversations, partners develop their own unique idioms (i.e., words or phrases; Bell, Buerkel-Rothfuss, & Gore, 1987). Eventually, they may communicate without any words at all—a single exchanged glance can reference prior conversations, inside jokes, or shared experiences.

We theorize that a sense of shared reality about the world at large can also manifest in ordinary conversations between strangers interacting for the first time. Indeed, as reviewed by Rossignac-Milon and Higgins (2018b), relationships research also suggests that stranger dyads experience shared inner states (interests, preferences, values, and other attitudinal similarities) about various targets. Conversations between new acquaintances meander through a variety of topics (Hobbs, 1990) about which they often establish common ground, converging in the content of their thoughts and feelings (Babcock, Ta, & Ickes, 2014; Deutsch & Mackesy, 1985; Hardin & Conley, 2001; Ickes, Tooke, Stinson, Baker, & Bissonnette, 1988; Kenny & Kashy, 1994; Ta, Babcock, & Ickes, 2017). Perceiving these shared inner states can play an important role in drawing people to each other initially, more so than perceiving shared characteristics, such as personality traits (Baskett, Byrne, & Hodges, 1971; Launay & Dunbar, 2015; Lydon, Jamieson, & Zanna, 1988; Montoya & Horton, 2013; Pinel, Long, Landau, Alexander, & Pyszczynski, 2006).

Though these various lines of work have empirically examined commonalities of inner states about *particular* targets, taken together, this body of research suggests that dyads—both close and newly acquainted—create a sense of topic-general, dyadic shared reality, which we hereby refer to as *generalized shared reality* (SR-G). We define SR-G as *the subjective experience of sharing a set of feelings, beliefs or concerns (i.e., inner states) in common with a particular interaction partner about the world in general*. By *topic-general*, we mean that this type of shared reality is about multiple topics and domains. *Dyadic* differentiates this type of shared reality from a collective shared reality experienced with social groups (e.g., religious groups or citizens of the same country) or with society more broadly. In contrast, this shared reality is experienced with the dyad-partner.[1] A dyadic shared reality can involve components that are not exclusive to the specific dyad—for example, a love for absurdist humor may be a component of my SR-G with more than one dyad-partner. However, this shared sense of humor would be only *one* component, among others, of my SR-G with each of these dyad-partners. Components that are *dyad-specific* (i.e., shared only between the members of the particular dyad, such as a private inside joke) may carry special importance to the dyad (Rossignac-Milon & Higgins, 2018b).

The central aims of this article are to (a) operationalize SR-G and (b) differentiate it from existing interpersonal constructs.

Operationalizing SR-G

We operationalized SR-G using both self-report (Studies 1–4) and observational coding of dyadic interaction behaviors (Studies 3 and 4).

Self-Reported SR-G

We sought to operationalize SR-G both as a chronic feature of a given relationship (e.g., one's sense of SR-G with a romantic partner across situations) and as a situational feature of a given interaction (e.g., SR-G during a particular conversation with another person, whether a stranger or familiar partner). We developed items to measure the individual's perception of the extent to which both partners (i.e., the dyad as a unit) share the same inner states about the world (e.g., "We typically share the same thoughts and feelings about things"). Note that in this way, the items differ from many established relationship measures that examine perceptions of one's own experience in the relationship (e.g., "Do I feel committed to my partner?"), or of one's partner (e.g., "Is my partner being responsive to me?").

Given that SR-G is about the world in general, we developed items to be truly general (i.e., without reference to any specific targets). For example, the item "We typically share the same thoughts and feelings about things" allows each respondent to interpret "things" to refer to whatever content they see fit. The advantage of this phrasing is that it allows for heterogeneity in content across different dyads (e.g., one dyad may mainly derive their sense of SR-G from their discussions of sports, politics, and food, while another from music, comedy, and fashion). To further ensure that the items could be answered irrespective of specific targets, we developed items that would convey the phenomenological experience of SR-G during dyadic interactions (e.g., the item "We often anticipate what the other is about to say" does not specify any target).

First, we pulled from prior theorizing in the literature and our conceptualization of SR-G to develop a set of items measuring SR-G as a chronic feature of a given relationship (used in Studies 1a-1d and Study 4). As proposed by Berger and Kellner (1964), close partners merge their sense of reality through their conversations. Thus, close partners high on SR-G should report that through their discussions, they often develop a joint perspective and that the way they think has become more similar over time. They should feel that they have created their own reality. Through this process, as theorized by Rossignac-Milon and Higgins (2018b), they may accrue such similar cognitive representations of the world that they find themselves frequently experiencing cognitive synchrony—having the same thoughts at the same time and anticipating what the other is about to say. Finally, because shared reality involves a sense of verification (Hardin & Higgins, 1996), knowing that one's partner is interpreting the world in the same way should validate one's experience of it (Rossignac-Milon & Higgins, 2018a). Partners with a high sense of SR-G should report that their impressions of events feel more valid and true when they experience them together (for an example of such enhanced realness, see Boothby et al., 2017).

In addition to crafting these chronic items, we created a modified version of these items to describe a specific interaction (e.g., Study 3: "During our interaction, we shared the same thoughts and feelings about things"), or a given day (e.g., Studies 2a–2c: "Today, we . . ."). This allowed us to examine SR-G as a dynamic feature of interpersonal interactions (e.g., the extent to which stranger dyads experience SR-G in an initial conversation).

Because shared reality is theorized to satisfy both relational and epistemic needs (Echterhoff, Higgins, & Levine, 2009), we exam-

[1] This type of SR-G may occur in triads and small groups, but for the purposes of this article we focus specifically on dyadic shared reality.

ined effects of SR-G on relational and epistemic variables to establish convergent validity. We expected self-reported SR-G to be positively related to established relationship constructs between close partners (e.g., intimacy, satisfaction, commitment) and to markers of social connection between strangers (e.g., closeness, the feeling of "clicking"). We also expected self-reported SR-G to be positively related to epistemic variables (e.g., trusting the other person as a source of truth, feeling more certain of one's individual perceptions). These links provide supportive evidence that these items are in fact measuring shared reality.

Behavioral Signatures of SR-G

We also sought to capture observable behavioral signatures of SR-G (Studies 3 and 4). Although it is a subjective experience, we theorize that SR-G may correspond to particular dyadic interaction behaviors. Research has shown that strangers often exhibit different forms of conversational synchrony and interactional alignment, such as collaboratively completing each other's sentences, jointly constructing utterances, and engaging in other coordinative microdynamics (Coates, 1997; Garrod & Pickering, 2009; Koudenburg, 2018; Lerner, 1991, 1996; McFarland, Jurafsky, & Rawlings, 2013). Colloquial descriptions of this type of occurrence as a powerful social connector abound (e.g., "finishing each other's sentences" or "speaking the same language"). Based on this prior work and our theorizing, we developed a coding scheme to measure a specific set of SR-G behaviors: vocalizing thought similarity (e.g., "I was thinking the same thing"), vocalizing agreement (e.g., "I completely agree"), saying the same things at the same time (e.g., simultaneously expressing the same idea), and finishing each other's ideas (e.g., building off each other's ideas and seemingly sharing a stream of consciousness).

We theorize that these behavioral signatures can be observed both between new acquaintances and between close dyad partners. We contend that when new acquaintances communicate in this way, these behaviors may signal to the dyad-partners that they generally tend to think about the world in the same way (e.g., if we say the same thing at the same time, I may infer that we generally share the same thoughts and feelings about the world). Thus, we propose that the behavioral signatures of SR-G should correspond to dyad-partners' self-reports of SR-G. Further, the behavioral signatures of SR-G should predict self-reported relational and epistemic variables to the extent that they are subjectively experienced as SR-G. We therefore hypothesize that self-reported SR-G will mediate the relation between behavioral signatures of SR-G and these relational and epistemic variables (Study 3).

Further, we propose that in the context of close relationships, partners who are high on SR-G may use these interaction behaviors as a way to reaffirm their sense of SR-G in the face of threat. Close partners are often motivated to reaffirm aspects of their relationships when these aspects are threatened (see Murray & Holmes, 2015 for a review). For example, in the face of partner transgressions or discovering incompatibilities, close partners may boost their perceptions of relationship quality or perform favors for their partner. These threat-mitigation strategies can be enacted either individually (i.e., changing one's own perceptions or performing individual actions) or dyadically (i.e., through interpersonal interaction; Ogolsky, Monk, Rice, Theisen, & Maniotes, 2017). Because SR-G fundamentally involves the perception of the *dyad's* experience of the relationship (rather than the *individual's* experience of the relationship), we predict that partners will reaffirm their sense of SR-G *together*, through a dyadic interaction in which they enact the behavioral signatures of SR-G (Study 4).

Examining the Uniqueness of SR-G as an Interpersonal Construct

SR-G complements existing interpersonal constructs in two central ways. Below, we describe these conceptual differences and outline how we empirically demonstrate them.

Joint Attention to the World Outside of the Relationship

First, as put forward by Clark and colleagues (2008), the field of close relationships has mainly examined phenomena in which relationship partners jointly attend to either the self, the partner, or the relationship itself, rather than experiences in which partners jointly attend to stimuli external to their relationship. For example, the Inclusion of the Other in the Self (IOS; "How much do I include my partner in my sense of self?"; Aron et al., 1992), relationship-specific identification ("How much do I include my relationship in my sense of self?"; Linardatos & Lydon, 2011), support ("Is my partner there for me in times of need?"; Pierce, Sarason, & Sarason, 1991), trust ("Is my partner someone I can count on?"; Rempel, Holmes, & Zanna, 1985), intimacy ("How intimately connected do I feel to my partner?"; Fletcher, Simpson, & Thomas, 2000), perceived trait similarity ("Are my partner and I similar types of people?"), commitment ("How much do I want to maintain my relationship?"; Rusbult, Martz, & Agnew, 1998), and satisfaction ("How happy am I in my relationship?"; Rusbult et al., 1998) all involve perceptions of oneself, one's partner, or one's relationship rather than the exterior world beyond the relationship. As another example, in the case of perceived partner responsiveness ("How much does my partner validate, care for, and understand me?"; Reis, 2003), although the understanding subscale captures how much people feel *personally understood by their partner* ("How much does my partner get *me*?" Reis et al., 2017), it is not designed to capture whether people feel that they and their partner *share the same understanding of the world*: "How much do *we* get *it*?" In contrast, SR-G is about the world in general. Therefore, though SR-G can include shared inner states about oneself, one's partner, and one's relationship, to be generalized it must *also* involve partners sharing inner states about objects outside of their relationship.

In Study 4, we explicitly test the extent to which sharing inner states about the external world differentiates SR-G from other constructs by randomly assigning couples to receive false feedback that they either do or do not experience the external *sensory world* in the same way. We predict that baseline SR-G (measured in a presurvey) will uniquely interact with this manipulation. Specifically, couples high on SR-G who receive feedback that they do not experience the sensory world in the same way will exhibit motivated interaction behaviors to reaffirm their shared reality. Importantly, we predict that because SR-G is the sole relationship construct that directly involves partners' perceptions of their inner states about the external world, it will be uniquely sensitive to this manipulation.

Table 1
Descriptive Statistics for Generalized Shared Reality (SR-G) Across Studies

Study	Relational context	Study design	*N*	Reliability	*M*	*SD*	Min	Max
Study 1a	Romantic partners	Online surveys	125	.90	4.94	1.11	1.00	7.00
Study 1b	Romantic partners	Online surveys	130	.90	5.27	1.09	1.50	7.00
Study 1c	Romantic partners	Online surveys	166	.90	5.22	1.09	1.75	7.00
Study 1d	Romantic partners	Online surveys	186	.91	5.36	1.03	1.38	7.00
Study 2a	Close partners	Daily diary	212	.78	4.43	1.56	1.00	7.00
Study 2b	Close partners	Daily diary	142	.75	4.47	1.56	1.00	7.00
Study 2c	Close partners	Daily diary	191	.79	4.57	1.49	1.00	7.00
Study 3	Stranger dyads	Naturalistic online conversation	232	.95	5.05	1.36	1.00	7.00
Study 4	Romantic dyads	Laboratory experiment	187	.81	5.21	0.94	2.63	7.00

Note. See Appendix A for greater detail about the SR-G measures. The *N*s reflect the final *n* postexclusions. For reliability, in Studies 1a–1d, 3, and 4 we report Cronbach's alpha, and in Studies 2a–2c we report reliability of within-subject change (Bolger & Laurenceau, 2013).

Epistemic Motives

Second, shared reality involves epistemic motives—it is driven in part by the desire to make sense of the world and establish the truth (Echterhoff & Higgins, 2017; Rossignac-Milon & Higgins, 2018a). Constructs like intimacy, satisfaction, and identification do not involve this epistemic element. Even trust has been predominantly studied in terms of *relational* trust (Simpson, 2007) and not *epistemic* trust (i.e., trusting one's partner as a source of information and knowledge about the world; Echterhoff et al., 2005). Some existing interpersonal constructs can be epistemically motivated, such as self-verification and perceived partner responsiveness, insofar as they are driven by the desire to better understand one's own self (e.g., I can seek self-verification from my partner to feel more certain that I know myself; Reis et al., 2017; Swann & Brooks, 2012). Similarly, people can seek to establish perceived value similarity to verify that their values truly matter (Byrne, 1961). However, these constructs do not necessarily involve epistemic *motives*—one can simply be informed that another person shares one's self-perceptions or values, without seeking to better understand oneself or to verify one's values. Thus, perceived value similarity and self-verification would only constitute examples of shared realities if they were realized with this epistemic aim of establishing the truth. In these instances, these constructs would involve the creation of a target-specific shared reality about the self or values, which could be considered a subset of SR-G.

In Study 3, we test the uniquely epistemic component of SR-G through predictive augmentation (Shrout & Yip-Bannicq, 2017) by examining whether SR-G predicts epistemic variables after adjusting for other interpersonal relationship constructs. We hypothesize that, over and above other constructs, SR-G will predict epistemic trust in one's interaction partner, perceptions of joint sense-making (i.e., epistemic co-creation such as working together to understand stimuli and influencing each other's interpretations), perceptions of having converged in one's attitudes over the course of a conversation, and ultimately feeling more certain of one's individual perceptions. We also examine whether SR-G predicts these variables after adjusting for perceived agreement about a particular topic, to differentiate it from target-specific shared reality, which is the subject matter of the vast majority of prior shared reality research.

Overview of Studies

Our primary aims were to operationalize SR-G, both phenomenologically and behaviorally, and to examine its uniqueness as an interpersonal construct. In Studies 1a–1d, we aimed to examine SR-G as a chronic feature of close relationships by developing a set of items to measure SR-G and situating it within existing relationship constructs, establishing initial convergent and discriminant validity. Next, in Studies 2a–2c, we used daily diary paradigms to demonstrate that SR-G can also be experienced as a dynamic, situation-specific state. We examined whether, on days when people experience greater SR-G with a partner (relative to their average level of SR-G with that person), they experience greater interpersonal connection.

Having established that SR-G can function as a state in close dyads, in Study 3, we conducted a naturalistic study to examine SR-G as a state in newly acquainted dyads conversing online. We further established convergent validity and predictive augmentation by examining the relationship between SR-G and indicators of social connection (i.e., "clicking", closeness, rapport, and the desire to interact again) and epistemic variables (i.e., certainty, epistemic trust, joint sense-making, and perceived attitude convergence), over and above other relational constructs and target-specific shared reality. We also examined the behavioral signatures of SR-G and tested whether self-reported SR-G mediated the relationship between these behavioral signatures and both relational and epistemic variables.

Finally, in Study 4, we experimentally challenged romantic dyads' perception of experiencing the sensory world in the same way. We predicted that couples high on baseline SR-G would reaffirm their SR-G in a subsequent interaction by exhibiting more behavioral signatures of SR-G, constructing greater latent shared meaning, making more dyad-specific references, and establishing greater shared reality during a subsequent joint decision-making task. In addition to demonstrating that SR-G is informed by shared perceptions of the external world, this study provides evidence for the *motivation* to uphold an existing sense of SR-G. Together, these studies suggest that SR-G is a novel construct that plays an important role in interpersonal interactions, both between close partners and between strangers.

Studies 1a–1d

In Studies 1a–1d, we developed a set of items to measure SR-G and situate SR-G among other close relationship constructs. We predicted that it would correlate with all close relationship variables we measured. We also predicted that the SR-G items would load onto a unique factor in exploratory factor analyses with items from all relationship constructs. To further distinguish SR-G from related constructs, as a proof-of-concept and initial test of predictive augmentation (Shrout & Yip-Bannicq, 2017), in Study 1d we investigated the extent to which SR-G predicted the likelihood of having experienced the feeling of having *merged minds*, which we conceptualize as a particularly pronounced moment of SR-G.[2] We included a slightly different set of measures in each study (details below) to avoid burdening participants with all measures in a single survey. Given the resemblance of these studies, whenever possible we aggregate descriptions and present pooled results. Otherwise, we show results for Study 1d (which included the greatest number of measures) and include the results of Studies 1a–1c in the online supplemental materials.

Table 2
Correlation Matrix of Close Relationship Variables (Study 1d)

Variable	SR-G	1	2	3	4	5	6	7	8	9
1. IOS	.60	—	—	—	—	—	—	—	—	—
2. Intimacy	.64	.62	—	—	—	—	—	—	—	—
3. PPR	.62	.56	.84	—	—	—	—	—	—	—
4. Commitment	.55	.47	.63	.61	—	—	—	—	—	—
5. Satisfaction	.64	.60	.85	.85	.70	—	—	—	—	—
6. Identification	.63	.51	.55	.52	.49	.56	—	—	—	—
7. Value sim.	.29	.16	.34	.31	.24	.36	.25	—	—	—
8. General sim.	.59	.43	.55	.50	.35	.52	.40	.37	—	—
9. Centrality	.56	.49	.38	.34	.40	.39	.62	.19	.38	—
10. RCI	.33	.36	.47	.39	.28	.37	.34	.09	.36	.28

Note. SR-G = generalized shared reality; IOS = inclusion of other in self; PPR = perceived partner responsiveness; RCI = relationship closeness inventory; sim. = perceived similarity. Because Study 1d (N = 186) assessed the greatest number of constructs, we present the correlations from this study as a key example across studies. These correlations are representative of those that arose between SR-G and relationship variables across Studies 1a–1c (see the online supplemental materials).

Method

Participants. Participants in Studies 1a–1d were screened to have been in a romantic relationship for at least one year. Demographic information is pooled here (for demographics and sample size determinations in each sample, see the online supplemental materials). We recruited 678 Mechanical Turk workers who participated for financial compensation. Prior to data analysis, we excluded data from 71 participants who failed at least one of two attention checks. The final sample consisted of 607 participants (62% female; M_{age} = 35.95 [SD = 11.51]; 88% heterosexual). Their average relationship length was 9.40 years (SD = 8.40), and 83% were cohabiting and/or married.

Materials and procedure. Participants rated their agreement with the items in each of the following measures on a 7-point Likert-type scale (1 = *strongly disagree*, 7 = *strongly agree*). Measures were presented in a randomized order and separated by 30-s filler anagram tasks to prevent spill-over effects between the questionnaires. Demographic questions appeared last.

Established close relationship measures. We measured: Satisfaction (Studies 1a–1d; α = .95; Rusbult et al., 1998), Commitment (Studies 1a–1d; α = .96; Rusbult, Kumashiro, Kubacka, & Finkel, 2009), Perceived Partner Responsiveness (Studies 1a–1d; α = .97; Reis, 2003), Relationship-Specific Identification (Studies 1a–1d; α = .93; Linardatos & Lydon, 2011), Inclusion of Other in the Self (Studies 1a–1d; Aron et al., 1992), Intimacy Subscale of Perceived Relationship Quality Components (Studies 1b-1d; α = .91; Fletcher et al., 2000), Perceived Social Support (Studies 1b-1c; α = .88; Pierce et al., 1991), Trust (Study 1c; α = .92; Rempel et al., 1985), Perceived Value Similarity (Studies 1c and 1d; Schwartz, 1992; Schwartz, 2003), Relationship Centrality (Study 1d; α = .87; Agnew, Van Lange, Rusbult, & Langston, 1998), and the Relationship Closeness Inventory (Study 1d; Berscheid, Snyder, & Omoto, 1989). Greater detail for each measure is provided in the online supplemental materials.

Generalized shared reality (SR-G; Studies 1a–1d). Participants completed an eight-item measure of SR-G (see Appendix A and Table 1 for descriptive statistics), based on our conceptualization of the experience of topic-general, dyadic shared reality in close relationships (as discussed above) and expert ratings providing content validation of the items (e.g., "We typically share the same thoughts and feelings about things," "We frequently think of things at the exact same time," "Through our discussions, we often develop a joint perspective").[3]

Perceived general similarity (Study 1d; α = .95). We created five items to measure a general sense of perceived similarity: "My partner and I are very similar people," ". . . are very much alike," ". . . are the same type of person," ". . . have a lot of characteristics in common," and ". . . have similar personalities."

Merged minds (Study 1d). We asked participants, "Have you ever felt that you and your partner had, in some sense, merged your minds?" with three possible answers: "yes," "no," and "I have no idea what you mean by that."[4]

Results

SR-G confirmatory factor analysis. Using the *lavaan* R package (Rosseel, 2012), we conducted a confirmatory factor analysis (CFA) with robust standard errors (MLR) to test a model in which all SR-G items loaded on a single latent variable. To ensure adequate sample size for a CFA, we pooled data from all four studies. To correct for data aggregation across samples, we centered each item within each sample and then added the grand

[2] To be clear, we theorize that dyads may have a high SR-G without ever experiencing *merged minds*, but it would be rare to experience merged minds without having some degree of SR-G.

[3] Note that in Study 1a, to rule out the otherwise plausible explanation that SR-G items would load onto a unique factor in EFAs with items from all relationship constructs because of phrasing clustering, we phrased the items in the same way as the other scales; i.e., using "my partner and I" instead of "we" (e.g., "My partner and I typically share the same thoughts and feelings about things").

[4] We included this latter option to guard against an artificial inflation of "yes" answers: We theorized that some participants might have difficulty understanding what the expression "merged minds'" means unless they have experienced it, but might be reluctant to answer "no" because of relationship-enhancement biases.

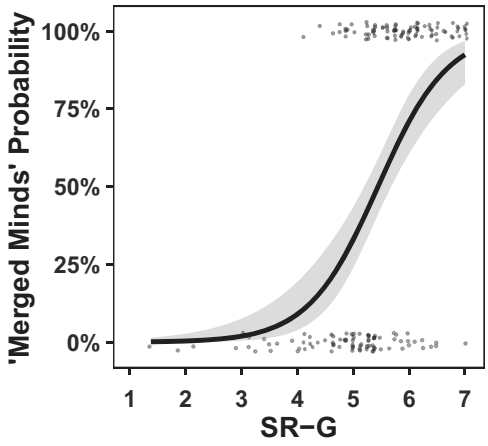

Figure 1. The probability of experiencing 'merged minds' as a function of generalized shared reality (SR-G; Study 1d).

mean of the items across samples (though the results are nearly identical without this correction).[5] The model yielded satisfactory fit statistics (Marsh, Hau, & Wen, 2004): CFI = .95, SRMR = .04, RMSEA = .09, 90% CI [.07, .10], $\chi^2(20) = 107.28$ ($p < .001$). The items had adequately high loadings (Matsunaga, 2010), ranging from .64 to .80. These results corroborate the unidimensional structure of the SR-G construct.

Convergent validity. Across Studies 1a–1d, SR-G significantly and positively correlated with the other relationship variables (see Table 2 for a correlation matrix in Study 1d and the online supplemental materials for correlation matrices in Studies 1a–1c). The correlations between SR-G and each of the other scales were comparable to the correlations among existing close relationship constructs.

Uniqueness of SR-G items. To investigate the uniqueness of SR-G, we conducted an exploratory factor analysis (EFA) with oblique rotation including items from *all* of the close relationship scales. Given that we included different variables in each sample, we conducted these separately. In each analysis, we suppressed small coefficients with a value below 0.32 (as recommended by Yong & Pearce, 2013). Across each study, the SR-G items consistently loaded onto a unique factor with very few and weak cross-loadings, if any (see the online supplemental materials).[6]

Predicting merged minds. The frequency of responses were as follows: "yes": 82, "no": 84, and "I have no idea what you mean by that": 20. We conducted a logistic regression with "yes" answers coded as 1 and "no" as 0.[7] The model-predicted log-odds of having experienced merged minds as a function of SR-G were 1.66 (95% CI [1.09, 2.20], $z(165) = 5.68$, $p < .001$; see Figure 1). Transformed into a probability metric, this indicates that participants 1 *SD* above the mean on SR-G had an 82% likelihood of having experienced merged minds, compared with a 14% likelihood for those 1 *SD* below the mean. SR-G continued to significantly predict merged minds in a series of logistic regressions simultaneously entering each other individual predictor (see the online supplemental materials). SR-G accounted for nearly all the variance explained by these other predictors.

Discussion

Studies 1a–1d established initial evidence for the structural, convergent, discriminant, and predictive validity of the SR-G construct. The SR-G items were internally consistent and unidimensional. They were significantly correlated with other conceptually related close relationship variables. Further, across four samples, the SR-G items loaded onto a unique factor in an EFA with all items, suggesting that SR-G is nonredundant with existing constructs. In a series of regression analyses with each other close relationship construct, SR-G was the only variable to predict the experience of having *merged minds*, establishing a proof-of-concept.

Studies 2a–2c

In Studies 2a–2c, we examined SR-G in the context of daily experiences *in vivo*—as they unfold in their natural settings (Bolger, Davis, & Rafaeli, 2003). We sought to (a) identify SR-G as an experience occurring in daily interactions with a close partner and (b) examine whether SR-G tracks with a marker of interpersonal connection at the daily level, as a within-person process. We hypothesized that on days when people experience greater SR-G with a dyad-partner (relative to their average level of SR-G with that person), they experience greater interpersonal connection. Participants selected a close partner and reported on their sense of SR-G and IOS with that partner on each day. In addition to examining within-day associations, we performed lagged analyses to investigate the relationship between SR-G on IOS on a given day, adjusting for IOS on the previous day. Adjusting for lagged IOS results in the outcome variable being residualized change in IOS. This strengthens the claim that any change in IOS is attributable to that day's events rather than lingering effects from the prior day's events (Bolger & Laurenceau, 2013). Given the resemblance of studies, descriptions and results are presented together whenever possible (for details and sample size determinations of each study, see the online supplemental materials).

Method

Participants. Participants were 689 undergraduates enrolled in a psychology course who participated for course credit. The

[5] Centering each item within each sample removes sample-level differences across items, which could introduce noise into the factor structure. Adding the grand mean (a constant) converts the output into a meaningful metric without affecting the results. The resulting items have the mean across all samples but pooled within-sample error variance. See Thompson and Bolger (1999) for a similar approach to preparing data for factor analyses by centering items within grouping variables (e.g., within-person) to remove group-level differences across items.

[6] It is worth noting that in each study, the majority of items from several of the existing constructs (particularly satisfaction, intimacy, responsiveness, and support) all consistently loaded onto the first factor. This helps address the alternative explanation that the SR-G items loaded onto their own factor simply because the items were presented as a single block, given that the items in these other measures were also presented in their own respective blocks but did not load onto unique factors.

[7] For this analysis, those answering "I have no idea what you mean by that" were excluded, but the results do not change appreciably when they are coded as 0 (see the online supplemental materials).

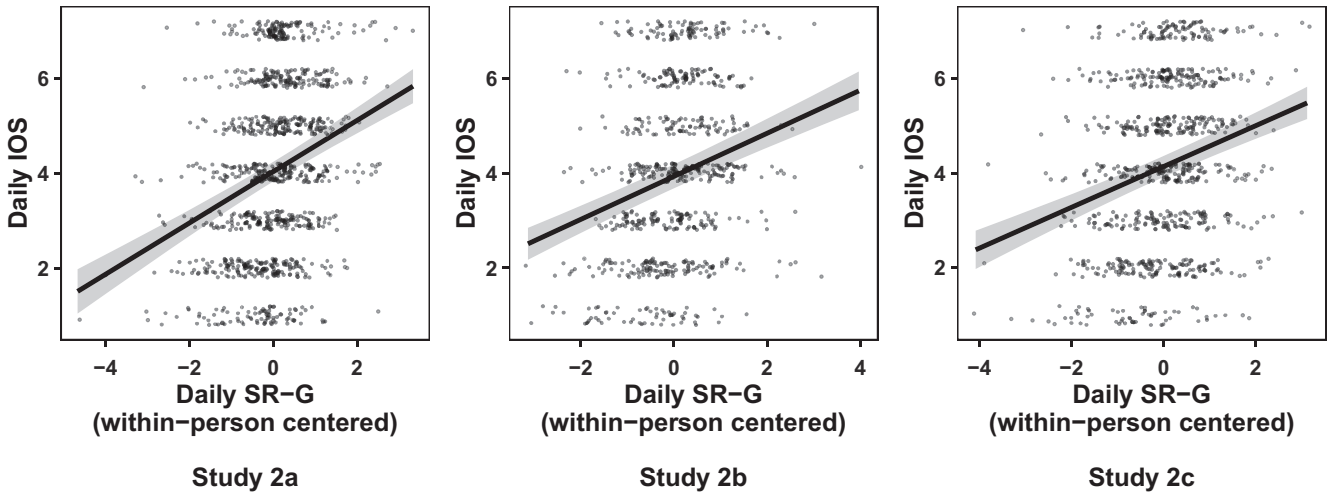

Figure 2. Within-person Daily generalized shared reality (SR-G) predicting Daily IOS, adjusting for Diary Day and the previous day's inclusion of other in self (IOS; Studies 2a, 2b, and 2c).

final sample consisted of 545 participants (64% female; M_{age} = 20.92; SD = 4.49). We excluded data from any diary days on which participants did not answer either IOS or SR-G (540 diary entries total out of 3111), and any days on which they failed the attention check (40 entries). With these remaining entries, we excluded data from 34 participants with fewer than two entries to allow for lagged analyses.

Procedure. Participants were instructed to select a relationship partner with whom they interacted on a daily basis. 174 participants chose their romantic partner, 184 chose a friend, 89 chose a roommate, 64 chose a parent, 23 chose a sibling, and 8 chose a different type of relationship partner. For five nights between 8 p.m. and 1 a.m. (beginning on a Sunday), participants were asked to respond to questions about their interactions with this partner.[8]

Materials.

SR-G. We modified a subset of the SR-G items used in Studies 1a–1d to ask about a given day: "Today we shared the same thoughts and feelings about things," "Today our conversations felt very real," and "Today we thought of things at the exact same time." The reliability of within-subject change met current standards (Table 1; Bolger & Laurenceau, 2013).

IOS (1-item). Participants completed the same item as in Studies 1a–1d, but it was modified to ask about their feelings on that day.

Results

Within-person correlations. The within-person correlations of SR-G and IOS ranged from .45–.55 across studies.[9] This indicated that SR-G and IOS had more than 70% unshared variance, suggesting that these are not redundant constructs.

Analytic approach. Our central analyses were conducted using multilevel modeling with the *lme4* and *lmerTest* R packages (Bates, Mächler, Bolker, & Walker, 2014; Kuznetsova, Brockhoff, & Christensen, 2017). Following procedures specified by Bolger and Laurenceau (2013), SR-G and IOS were within-person mean centered. In each analysis, SR-G was entered as a predictor and we controlled for diary day (centered on the middle day of the study). We also included random intercepts of subject and SR-G as a random slope. We first examined the within-day effect of SR-G on IOS. Next, we performed lagged analyses to examine the effect of SR-G on IOS on a given day, adjusting for IOS on the previous day.

IOS. Examining within-day associations revealed that SR-G was strongly linked to IOS, in Study 2a: b = .52, 95% CI [.45, .60], t = 13.82, $p < .001$, Study 2b: b = .49, 95% CI [.42, .56], t = 14.47, $p < .001$, and Study 2c: b = .39, 95% CI [.31, .46], t = 10.87, $p < .001$.

When we simultaneously entered the prior day's IOS as a predictor, the link between SR-G and IOS remained highly significant, with similar effect sizes (Study 2a: b = .54, 95% CI [.45, .63], t = 11.90, $p < .001$, Study 2b: b = 0.45, 95% CI [0.38, 0.53], t = 11.60, $p < .001$, and Study 2c: b = 0.43, 95% CI [0.34, 0.51], t = 10.21, $p < .001$; see Figure 2).

Discussion

These ecologically grounded results demonstrate that, in real life, SR-G with a close partner can fluctuate within-person from day to day. Further, on days when people feel a greater sense of SR-G with a partner relative to their average level of SR-G with that person, they feel a greater sense of IOS, and this effect is not due to residual effects from the previous day. These results provide further evidence of construct validity, suggesting that *state* SR-G is linked to a marker of relational closeness.

[8] Note that this study was part of a larger project testing multiple hypotheses and research questions. Here, we report the measures relevant to the present hypotheses. The full set of measures is available on OSF (https://osf.io/7rux5/). Data from these studies were also used in a article by Zee, Bolger, & Higgins (2020) to examine a separate research question regarding social support. This other article did not examine shared reality.

[9] Study 2a: r = 0.54, $p < .001$, 95% CI [0.48, 0.59], Study 2b: r = 0.55, $p < .001$, 95% CI [0.49, 0.61], and Study 2c: r = 0.45, $p < .001$, 95% CI [0.39, 0.52].

Study 3

Having identified SR-G as a situational state between close partners in Studies 2a–2c, in Study 3 we examined whether SR-G also manifests as a state between stranger dyads. Pairs of participants discussed several ambiguous images in a real-time, online conversation. We investigated the link between behavioral signatures of SR-G, such as vocalizing agreement or saying things at the same time, and self-reported SR-G. We theorize that these naturally occurring behaviors likely provide the basis of perceptions of having SR-G. Next, we examined how self-reported SR-G predicted relational variables ("clicking", interpersonal closeness, rapport, and the desire to interact again) and epistemic variables (certainty, epistemic trust, joint sense-making, and perceived attitude convergence over the course of the conversation). We hypothesized that self-reported SR-G would mediate the link between the SR-G behavioral signatures and these variables. That is, we predicted that the SR-G behavioral signatures would contribute to relational and epistemic variables to the extent to which they are subjectively experienced as SR-G by the participants.

As further evidence of predictive augmentation, we also tested whether SR-G predicted each of the relational and epistemic variables of interest beyond a general sense of perceived similarity and other conceptually relevant interpersonal constructs that have been shown to manifest between strangers, notably perceived partner responsiveness and IOS (Aron, Melinat, Aron, Vallone, & Bator, 1997; Birnbaum & Reis, 2012; Montoya & Horton, 2013). Doing so allowed us to show that SR-G contributes to indices of initial social connection over and above established constructs and to further differentiate SR-G from interpersonal constructs without an epistemic component. We also tested whether SR-G contributed to relational and epistemic variables over and above target-specific agreement, to confirm that the effects of SR-G are not accounted for by agreeing with one's partner about *particular* targets, which has been the focus of most prior shared reality research.

Method

Participants. We recruited a sample of 281 Mechanical Turk workers, who participated for financial compensation. Of those, 251 matched with a conversation partner (a fellow M-Turk participant) and completed the conversation task. Our final sample consisted of 232 participants (57% female; M_{age} = 38.2; SD = 11.46).[10] This sample granted us 80% power to detect an effect as small as $f^2 = .034$ (with .02 defined as a small effect size, and .15 as medium; Cohen, 1988).

Procedure. Participants were paired on arrival to an online chat platform. They were instructed to work together to answer a series of questions about two ambiguous images, with the goal of figuring out what was really going on in the images together. The images were selected from a set of ambiguous social interactions used in previous shared reality research (Kopietz et al., 2010; originally from the Multi-Motive Grid [Sokolowski, Schmalt, Langens, & Puca, 2000]). The server prompted participants with a new discussion question every two minutes for a total of six questions (12 min). Questions were crafted to generate discussion (e.g., "Why do you think the man in the hooded sweatshirt and the man with the pipe are talking?" See Appendix C for images and questions). The platform was structured like an instant-messenger conversation to allow for rapid exchanges. After conversing, participants answered a series of interpersonal questionnaires (presented in a randomized order) and then a series of questionnaires assessing their opinions about the images (also randomized), and finally, provided demographic information and completed a funneled suspicion check.[11]

Table 3
Descriptive Statistics and Reliability Indices for Outcome Measures (Study 3)

Outcome	*M*	*SD*	α
Relational			
Clicking	5.25	1.58	—
Closeness	4.98	1.28	.90
Positive rapport	5.82	1.48	.93
Negative rapport	2.80	1.67	.91
Desire to chat again	5.04	1.92	—
Epistemic			
Certainty	4.90	1.36	.94
Epistemic trust	5.40	1.35	.96
Joint sense-making	5.66	1.28	.96
Perceived agreement (initial)	4.35	1.53	—
Perceived agreement (final)	5.66	1.34	—

Note. Clicking, desire to chat again, and perceived agreement were all single-item measures.

Measures.

SR-G.

Observational coding of SR-G behavioral signatures (α = .83; see Appendix B for detail and examples). We developed a four-item coding scheme based on our conceptualization of the behavioral signatures of SR-G. Three independent observers, blind to hypotheses and any self-report measures, coded how frequently each dyad displayed the following behaviors during their conversation on a scale of 1 (*not at all*) to 7 (*very frequently*): *vocalizing thought similarity* (e.g., "That's exactly what I was thinking!"), *vocalizing agreements or shared feelings* (e.g., "I totally agree," "So true"), *saying things nearly at the same time* (e.g., near-synchronous exclamations, single-word utterances, or phrases with the same meaning), and *finishing each other's ideas* (e.g., riffing off of each other's ideas, seemingly sharing the same stream of consciousness). The order of transcripts was randomized for each observer. Interrater reliability (ICC = .81) was calculated based on a consistency, two-way mixed effects model (Koo & Li, 2016) and items were averaged into a composite score.

Self-reported SR-G. We adapted the SR-G items used in Studies 1a–1d so they could be answered about the discussion (see Appendix A and Table 1). Participants rated their agreement (1 = *strongly disagree*, 7 = *strongly agree*) with eight items like,

[10] Prior to data analysis, we excluded data based on several criteria. We excluded data from twelve participants who failed at least one of two attention checks (their partner's data was retained). We then screened the conversations based on the descriptions of robot identification in recent M-Turk studies and excluded data from any participants who appeared to have either been a robot (one) or conversed with a robot (three). Finally, we excluded data from three participants who expressed the erroneous belief that their partner was either a member of the research team or a robot during a suspicion check (i.e., in answer to the open-ended question, "Did you enjoy working with your partner?").

[11] Note that this study was part of a larger project testing multiple hypotheses and research questions. Here, we report the measures relevant to the present hypotheses. The full set of measures is available on OSF (https://osf.io/c3hjd/).

Table 4
Series of Regression Analyses Examining Relational and Epistemic Outcomes (Study 3)

Outcome	SR-G (single predictor)	Adjusting for perceived similarity	Adjusting for PPR	Adjusting for IOS	Adjusting for target-specific agreement
Relational					
Clicking	.85 [.76, .94]***	.36 [.23, .49]***	.57 [.44, .70]***	.65 [.55, .76]***	.76 [.65, .88]***
Closeness	.77 [.67, .86]***	.26 [.12, .40]***	.42 [.28, .55]***	.56 [.46, .67]***	.60 [.48, .72]***
Positive rapport	.69 [.60, .79]***	.28 [.13, .42]***	.32 [.19, .45]***	.53 [.42, .64]***	.54 [.42, .66]***
Negative rapport	−.59 [−.70, −.47]***	−.26 [−.46, −.07]**	−.29 [−.46, −.12]***	−.49 [−.63, −.34]***	−.53 [−.68, −.37]***
Desire to chat again	.65 [.55, .75]***	.16 [.01, .31]*	.46 [.31, .61]***	.50 [.38, .62]***	.58 [.44, .71]***
Epistemic					
Certainty	.43 [.31, .54]***	.31 [.11, .52]**	.36 [.18, .54]***	.35 [.21, .50]***	.30 [.15, .45]***
Epistemic trust	.73 [.64, .82]***	.43 [.29, .58]***	.45 [.32, .57]***	.63 [.52, .74]***	.48 [.38, .59]***
Joint sense-making	.88 [.78, 1.00]***	.89 [.70, 1.08]***	.41 [.27, .55]***	.81 [.67, .95]***	.64 [.50, .77]***
Perceived attitude convergence	.55 [.44, .66]***	.45 [.28, .62]***	.23 [.08, .38]**	.51 [.38, .64]***	—

Note. SR-G = generalized shared reality; PPR = perceived partner responsiveness; IOS = inclusion of other in self. All analyses were conducted as multilevel models with participants nested within-dyad. The first column displays the effect of SR-G on each of the outcome variables, and the others display the same effect adjusting for each competing predictor. Each cell contains the standardized beta coefficient (using the residual *SD* after removing the dyad-level component) and 95% CI.
* $p < .05$. ** $p < .01$. *** $p < .001$.

"During our chat, we shared the same thoughts and feelings about things," ". . . we thought of things at the exact same time," ". . . we saw the world in the same way."

Relational variables (see Table 3 for descriptive statistics and reliability).

Clicking. Participants rated their agreement (1 = *strongly disagree*, 7 = *strongly agree*) with one item: "I felt like my partner and I 'clicked'."

Closeness (McAuley, Duncan, & Tammen, 1989). Participants rated their agreement (1 = *not at all true*, 7 = *very true*) with the *relatedness* subscale of the Intrinsic Motivation Inventory (e.g., "I feel close to my partner," and "It is likely that my partner and I could become friends if we interacted a lot").

Rapport. Participants were asked to indicate the extent to which each word would describe their interaction if they had a chance to interact with their partner in person (0 = *not at all*; 8 = *extremely*; Bernieri, Davis, Rosenthal, & Knee, 1994). Five items assessed positive rapport (comfortable, friendly, harmonious, positive, satisfying) and five negative rapport (awkward, boring, cold, dull, slow).

Desire to interact again. Participants rated their agreement (1 = *strongly disagree*, 7 = *strongly agree*) with one item: "I would be interested in continuing our discussion."

Epistemic variables (see Table 3 for descriptive statistics and reliability).

Epistemic trust. Participants rated their agreement (1 = *not at all*, 7 = *very much*) with 3 items modified from Echterhoff and colleagues (2008) to measure the extent to which they trusted their partner as sources of truth about the pictures: "One can rely on my partner's impression of the pictures," "My partner is a credible source of information with regard to the pictures," "My partner is a person whose judgment about the pictures one can trust."

Joint sense-making. Participants rated their agreement (1 = *strongly disagree*, 7 = *strongly agree*) with five items we wrote to measure the extent to which participants felt that they had made sense of the pictures with their conversation partner (i.e., engaged in epistemic co-creation): "I feel that through our conversation, my chat partner and I made sense of the pictures together," ". . . merged our impressions of the pictures," ". . . worked together to understand the

Table 5
Self-Report SR-G Mediates Link Between SR-G Behavioral Signatures and Both Relational and Epistemic Outcomes (Study 3)

Outcomes	a path	b path	c path	c′ path	ab path
Relational					
Clicking	.34 [.23, .44], <.001	.80 [.70, .90], <.001	.27 [.14, .41], <.001	.00 [−.10, .11], .933	.27 [.18, .36], <.001
Closeness	.34 [.23, .44], <.001	.71 [.60, .82], <.001	.28 [.16, .41], <.001	.04 [−.06, .15], .422	.24 [.16, .32], <.001
Positive rapport	.34 [.23, .44], <.001	.69 [.58, .80], <.001	.14 [.02, .26], .026	−.09 [−.20, .01], .079	.23 [.15, .31], <.001
Negative rapport	.34 [.23, .44], <.001	−.49 [−.63, −.36], <.001	−.16 [−.30, −.01], .032	.01 [−.13, .15], .887	−.17 [−.24, −.10], <.001
Desire to chat again	.34 [.23, .44], <.001	.67 [.55, .78], <.001	.13 [.01, .26], .033	−.09 [−.20, .02], .098	.22 [.14, .31], <.001
Epistemic					
Certainty	.34 [.23, .44], <.001	.61 [.47, .74], <.001	.10 [−.03, .24], .128	−.10 [−.23, .03], .121	.20 [.13, .28], <.001
Epistemic trust	.34 [.23, .44], <.001	.66 [.55, .76], <.001	.29 [.18, .40], <.001	.07 [−.03, .16], .156	.22 [.14, .30], <.001
Joint sense-making	.34 [.23, .44], <.001	.72 [.61, .83], <.001	.53 [.40, .66], <.001	.28 [.17, .40], <.001	.24 [.16, .33], <.001
Attitude convergence	.29 [.18, .39], <.001	.52 [.40, .63], <.001	.29 [.17, .41], <.001	.14 [.03, .25], .012	.15 [.08, .21], <.001

Note. SR-G = generalized shared reality. These mediation models were conducted using multi-level models to nest within-dyad. For each path, the standardized beta coefficient is displayed, along with 95% CI and the *p* value. For each path for Attitude Convergence, perceived agreement postconversation is the outcome variable, adjusting for perceived initial agreement. See Figure 3 for depictions of the clicking and certainty models.

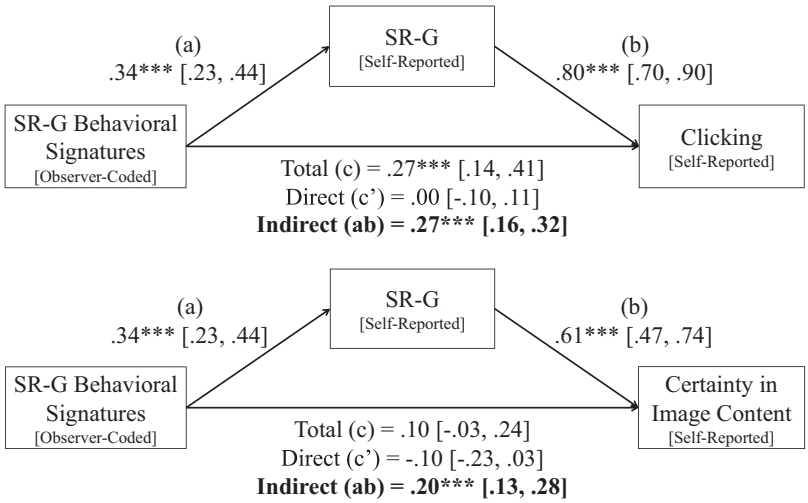

Figure 3. Self-reported Generalized Shared Reality (SR-G) mediated the relationship between SR-G behavioral signatures (coded by observers) and (1) self-reported 'clicking' with one's interaction partner (upper panel) and (2) self-reported certainty about what was really going on in the images (lower panel) - (the primary relational outcomes of interest in Study 3 – see Table 5 for other outcome variables). Indirect effects are bolded. (*** $p < .001$).

pictures," ". . . interpreted what was going on in the pictures together," ". . . influenced each other's perceptions of the pictures."

Perceived attitude convergence. Participants answered two questions (1 = *very different*, 7 = *very similar*): *perceived initial agreement*: "In general, how similar were your *initial* perceptions of the pictures (before you really talked about them)?" and *perceived final agreement*: "In general, how similar were your perceptions of the pictures *after* you had talked about them?" In all analyses measuring perceived attitude convergence, we used perceived final agreement as the dependent variable and adjusted for perceived initial agreement.

Certainty. Participants rated their agreement (1 = *strongly disagree*, 7 = *strongly agree*) with three items we wrote to measure certainty: "I am certain of what I think is really going on in the pictures," "I am sure of my impression of the scenes in the pictures," and "I have a pretty good idea of what I think is happening in the pictures."

Control variables.

IOS. We used the same item as in the prior studies (Aron et al., 1992).

Perceived partner responsiveness ($\alpha = .93$). Participants rated their agreement (1 = *strongly disagree*, 7 = *strongly agree*) with three items (Maisel & Gable, 2009): "My chat partner understood me," ". . . valued my abilities and opinions," and ". . . really listened to me," assessing the degree to which participants perceived that their partners had understood, valued, and cared for core aspects of themselves.

Perceived general similarity ($\alpha = .98$). We modified the five perceived similarity items used in Study 1d to be answerable based on a single interaction (e.g., "My partner and I seemed to be very similar people" instead of "My partner and I are very similar people").

Perceived agreement about a target. We used the *perceived final agreement* item mentioned above as a control variable in other analyses to explore the effects of SR-G on these variables over and above target-specific agreement.[12]

Results

All analyses were conducted as multilevel models with participants nested within dyads, using the *lme4* package in R (Bates et al., 2014). All individual-level variables were standardized using the residual standard deviation (after removing the dyad-level component from the variance), as recommended by Bolger and Laurenceau (2013). The behavioral signatures of SR-G predicted self-reported SR-G ($\beta = .44$, 95% CI [.32, .55], $t = 7.33$, $p < .001$). Further, self-reported SR-G (as rated by each dyad member) significantly predicted all relational and epistemic variables of interest (see Table 4).[13] In addition, SR-G predicted each of these variables even when adjusting for perceived general similarity, perceived partner responsiveness, IOS, and perceived agreement about the particular images (see Table 4).

Next, we ran a series of mediation models to investigate the role of self-reported SR-G in mediating the link between behavioral signatures of SR-G and each outcome variable (see Table 5 for these results and Figure 3 for models of the primary outcome variables, "clicking" and certainty).[14] The behavioral signatures of

[12] We also included a target-specific shared reality measure currently being developed by Schmalbach, Rossignac-Milon, Keller, Higgins, and Echterhoff (2020). The results do not change appreciably when using these items as a covariate instead of the perceived final agreement item. Given that this measure is yet unpublished, we report the results using the single perceived final agreement item.

[13] To guard against content-overlap, we removed the SR-G item that included the word *certainty* from all analyses examining certainty as a variable of interest and found that all effects remained robust and significant (see the online supplemental materials).

[14] To run multi-level mediation models, we were required to exclude data from incomplete dyads. We excluded data from 10 participants whose partner chatted with them but did not complete the rest of the study (i.e., dropped out part-way through), from 11 whose partner failed the attention check, and from three whose partner was suspicious that they were either a member of the research team or a robot. Our final *n* for these analyses is 208.

SR-G significantly predicted all of the outcome variables except for certainty. Critically, self-reported SR-G mediated the relationship between the behavioral signatures of SR-G and the relational variables, accounting for 85% to 100% of the total effect. We found the same pattern for the epistemic variables, accounting for 45% to 100% of the total effect.

Discussion

The behavioral signatures of SR-G between new acquaintances predicted self-reported SR-G, providing important evidence that self-reported SR-G, albeit a subjective experience, can be grounded in a kernel of truth—in the actual interaction behaviors displayed by a dyad. These interaction behaviors are noticeable to outside observers and actually correspond to the extent to which participants subjectively experience a sense of SR-G.

Further, we found that self-reported SR-G predicted important relational variables (the experience of "clicking", interpersonal closeness, rapport, and the desire to interact again) and epistemic variables (epistemic trust, joint sense-making, perceived attitude convergence, and certainty about what was really happening in the images), even when adjusting for perceived general similarity, perceived partner responsiveness, and IOS. These findings suggest that SR-G may contribute to both initial interpersonal connection and the experience of sense-making and certainty about objects in the world.

Further, SR-G related to each of these variables after controlling for perceived agreement about the specific images (target-specific shared reality). This finding is notable given that some of the epistemic variables asked specifically about the images (e.g., what was really going on in the images). This result suggests that experiencing a shared reality about the world at large can contribute to the experience of certainty about one's interpretation of particular objects beyond simply agreeing about those particular objects.

Finally, SR-G mediated the relationship between the observable behavioral signatures of SR-G and the relational and epistemic variables of interest. These results suggest that the behavioral signatures of SR-G were linked to a sense of interpersonal connection and certainty to the extent that they were subjectively experienced by the participants as SR-G. These results also show that the subjective experience of SR-G is not redundant with these conversational behaviors.

Study 4

Studies 1–3 provided evidence for SR-G as a distinct construct and demonstrated its existence in a range of contexts—as a chronic feature of romantic relationships, as a state in everyday life, and as a feature of online conversations between strangers. In Study 4, we further differentiated SR-G from other constructs by testing the extent to which SR-G is informed by shared perceptions of the external world. Specifically, we examined couples' behavioral responses to experimental feedback challenging their belief that they experience the sensory world in the same way. We predicted that in the face of this threat, couples high in baseline SR-G would display motivated, dyadic behaviors attempting to reaffirm their SR-G in a subsequent interaction. Importantly, this study also tested the extent to which SR-G is an aspect of their relationship that partners are motivated to uphold.

Study 4 used a dyadic experimental design with romantic couples. One week prior to the laboratory portion of the study, participants answered a variety of baseline close relationship questionnaires including SR-G. Once in the laboratory, couples independently and silently rated a variety of sensory stimuli relating to visual, tactile, and gustatory experiences. They were informed that a (fictitious) software program would use their responses to compute the extent to which they overlapped with their partner in their direct experience of the sensory world. Couples were randomly assigned to receive feedback that, relative to the average couple, they had low (vs. high) overlap in the way they experience the sensory world. We theorized that for couples high on baseline SR-G, the low sensory overlap feedback would challenge their sense of experiencing the external world in the same way. We hypothesized that when subsequently given the opportunity to interact, these couples would be motivated to behaviorally reaffirm their SR-G. We also hypothesized that in contrast, for those low on SR-G, the low sensory overlap feedback would not trigger efforts to reaffirm SR-G.

To capture these behavioral efforts to reaffirm SR-G, we measured several variables: (a) behavioral signatures of SR-G (as examined in Study 3), (b) Latent Semantic Similarity (LSS; Babcock et al., 2014; Ta et al., 2017), a computational linguistic measure of shared meaning, (c) the number of dyad-specific references (i.e., exclusive to the dyad, such as private inside jokes) versus personal or generic references made in conversation, and (d) the shared reality created during a subsequent joint decision-making task.

Method

Participants. One hundred ten couples (220 participants) were recruited to participate for financial compensation through a participant pool of university affiliates, flyers posted around campus, and ads on community websites. Couples were screened to have been in a romantic relationship for at least one year, to both be at least 22 years old, and to both be fluent English speakers. They were also screened for dietary restrictions that would preclude them from consuming any of our food samples.

Prior to data analysis, we excluded data based on several criteria. We excluded data from one dyad whose conversation revealed that they were not actually a couple, from eight couples who did not follow the instructions to remain silent during the Calibrix portion of the experiment and communicated several times with their partner, disclosing their reactions to the stimuli to each other (thereby interfering with the manipulation) and/or their score to the experimenter (thereby making the experimenter aware of their condition),[15] and from four couples whose members were accidentally assigned to different conditions. We also excluded data from one participant who expressed the suspicion that their scores were not actually generated by Calibrix and from six participants who failed the attention check, but we retained data from these participants' partners. The final sample consisted of 187 participants (53% female; M_{age} = 28.77 (SD = 8.04)). The average relationship length was 4.52 years (SD = 5.57), and 15 participants were in a same-sex relationship. This sample granted us 80% power to detect

[15] Several of these couples also met other exclusion criteria (e.g., did not discuss the images during the conversation, or remained predominantly silent during the conversation). We do not enumerate these criteria here as these couples were already excluded based on this first criterion.

an effect as small as $f^{2} = .09$ (with .02 defined as a small effect size, and .15 as medium; Cohen, 1988).

Procedure. Five to 10 days prior to the laboratory portion, participants completed an online survey answering various relationship questionnaires, described below, including SR-G.

Sensory experience overlap feedback manipulation. Upon arriving at the laboratory, couples were seated side by side at a large table and separated by a translucent screen (so that participants were aware of each other's presence without being able to see each other or each other's responses to any questions).

Experimenters introduced them to *Calibrix*, a (fictitious) software program that would compute their "sensory style"—their own way of experiencing the sensory world. They were told that they would independently and silently sample and rate a variety of sensory stimuli relating to visual, tactile, and gustatory experiences on various dimensions (e.g., texture, sweetness, saturation). Specifically, participants were told:

> This set of objects and questions accompanies a software program called Calibrix that was originally developed for marketing purposes and has been recently adapted to study psychological processes by a team of researchers. It's been validated across a number of different labs, including our own. Calibrix uses an algorithm that, based on your answers to these questions, can compute what's called your sensory style—your own way of engaging with and perceiving sensory experiences. This activity will be a silent one so we ask that, as a part of the standard protocol, you not speak to each other. Please keep your reactions to yourself.

Participants silently engaged with each sample for 20-s and then privately rated their responses on iPads. To decrease the likelihood that participants would be able to guess each other's answers, each sample was carefully selected and pretested ($N = 20$) to ensure a high response variance and uncertainty regarding how one's partner would respond (see the online supplemental materials). Participants evaluated three fabric samples (silk, burlap, and velvet; e.g., "How smooth is this sample?"), three food samples (selected for their generally unique and unrecognizable flavor profiles to be unfamiliar to most participants, e.g., "How crunchy is this sample?"), and three colors (e.g., "How saturated is this sample?"). In addition to rating their perceptions of the samples' properties, participants also indicated how much they liked each sample. The full set of items and questions, along with the Experimenter script guiding participants through this portion of the study, can be found in the Appendix C.

Next, the researcher told participants:

> Now that you have answered questions about each of these different types of objects, you are going to submit your responses to Calibrix. Based on all the different sensations you just experienced, Calibrix will compute the similarity of you and your partner's sensory styles. What you'll be seeing is a percentage overlap of your scores—this will indicate how similarly you and your partner experience the sensory world. For example, if you perceived the objects more similarly, you should see a high percent of overlap in your scores. Research has shown that both similarity and complementarity in sensory styles can have benefits, so it's not necessarily better to be similar or to be different—both can be good.

This latter portion of the script about complementarity was included to minimize the effect of our experimental manipulation on relationship satisfaction. Because our intent was to manipulate couples' perceptions of the extent to which they experience the sensory world in the same way, and *not* relationship satisfaction, we did not want to give couples the impression that the *Calibrix* output reflected their compatibility. After couples submitted their sample evaluations, they were randomly assigned (as a couple) to the low or high sensory overlap feedback condition. Participants in the low condition were shown a graph indicating that their sensory experience overlap was 31.8%, whereas participants in the high condition were shown a graph indicating that their sensory experience overlap was 82.4%. In both conditions, the graph additionally indicated 57.1% as the "overlap for the average couple" (see Appendix C for images of these graphs). These percentages were also pretested to ensure their believability.

Next, participants engaged in a shared experience: They jointly viewed a slideshow of a set of images used in prior shared experience studies (Boothby et al., 2017), developed to be moderately real and likable. Participants were instructed not to talk to one another while viewing the images. Participants were then separated into breakout rooms and completed several questionnaires, including a mood measure, several close relationship measures, a manipulation check, and an attention check.[16]

Ten-min conversation. Partners were then reunited and asked to engage in a 10-min video-recorded conversation about the images they viewed during their shared experience. They were provided with three conversation prompts to discuss for approximately 3 mins each: "How likeable were the images?," "How real did the images seem?," and "Did any of the pictures remind you of other things? If so, of what?" The experimenter exited the room and knocked on the door at 3-min intervals to signal to the couple that they should move on to the next prompt.

Joint decision-making task. Finally, the experimenter reentered the room and placed prints of five images the couple had viewed during the image-viewing task on the floor in front of the couple and invited them to select one photo to bring home (to share).[17] The couple was given a couple minutes to select an image (during which their conversation was video-recorded), after which the experimenter asked what their final decision was.

Measures.

Online presurvey (baseline close relationship variables). Participants completed a baseline survey between five to 10 days prior to their laboratory participation, including measures of SR-G (see Appendix A and Table 1), relationship satisfaction ($\alpha = .87$), commitment ($\alpha = .92$), identification ($\alpha = .85$), IOS, responsiveness ($\alpha = .95$), intimacy ($\alpha = .83$), support ($\alpha = .76$), and trust ($\alpha = .86$; See Studies 1c and 1d for a description of each of these measures). The only measure with different items than those used in Studies 1c and 1d was perceived general similarity (one item: "My partner and I have similar personalities."). We included these well-established relationship measures to see whether couples'

[16] Note that this study was part of a larger project testing multiple hypotheses and research questions. Here, we report the measures relevant to the present hypotheses. The full set of measures is available on OSF (https://osf.io/x2yzt/).

[17] We selected images that were most attractive according to prior research (Boothby et al., 2017).

SR-G uniquely interacted with experimental condition to predict our outcomes of interest.[18]

Measures collected after experimental manipulation and shared image viewing experience (prior to conversation).

Mood (control variable). To rule out participants' mood as a potential alternative explanation, we measured the Positive And Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), which consists of two 10-item scales to measure both positive ($\alpha = .89$) and negative ($\alpha = .87$) affect, rated on a scale of 1 (*not at all*) to 5 (*very much*).

Attention check: Recall of sensory style overlap. Participants were asked "How did your sensory style overlap compare to the average couples' overlap?" (1 = *much higher*, 2 = *higher*, 3 = *equal*, 4 = *lower*, 5 = *much lower*; 6 = *I do not remember*). As mentioned in the Participants section, we excluded data from any participants in the low condition who answered 1–3, any in the high condition who answered 3–5, and any who did not recall (for a total of 8 out of 220 participants). Participants were also asked, "What was your sensory style percentage overlap with your partner?" to which they responded using a slider scale from 0–100. Of the remaining participants, all correctly selected an overlap that matched their experimental condition. Also, participants were generally quite accurate in their recall (low condition: $M = 33.02$, $SD = 2.77$; high condition: $M = 82.60$, $SD = 3.12$).

Manipulation check ($\alpha = .85$). We used a manipulation check to ensure that participants in the low (vs. high) sensory experience overlap feedback condition felt that they and their partner overlapped less in the way they experienced a subsequent activity. We designed the manipulation check to confirm that participants were still affected by the feedback during a subsequent activity (but prior to being given the opportunity to interact). This check included three items: participants rated their agreement on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*) with two items: "While I was viewing the images . . . I felt like my partner and I were on the same wavelength." ". . . I felt like my partner and I were 'getting' each other." They also selected "the picture that best describes the extent to which you feel you shared the experience of viewing the images with your partner" from a series of increasingly overlapping circles laying on a continuous line with each end labeled as "my experience" and "my partner's experience."

Conversational linguistic measures.

Latent semantic similarity. In conversation contexts, latent semantic similarity (LSS) serves an index of the *degree of shared meaning and common ground* that has developed in that conversation (Babcock et al., 2014; Ta et al., 2017). Given the importance of shared meaning in conversation in shared reality (Berger & Kellner, 1964), LSS was ideally suited to serve as a dependent measure of interest. LSS is computed using latent semantic analysis (LSA), an automated statistical computation method that analyzes the relationship among the words used in a text to establish its contextual meaning (Landauer & Dumais, 1997; Landauer, Foltz, & Laham, 1998). Specifically, LSS uses LSA to compare the contextual meaning of two blocks of text. We used the *LSAfun* R package (with the TASA corpus) to compute LSS (Günther, Dudschig, & Kaup, 2015; based on Dennis, 2007). Essentially, the package inputs the two blocks of texts into a high-dimensional semantic space and computes the cosine of the angles between the two resulting vectors, outputting an LSS index on a scale of −1 to 1 (higher values indicate greater shared meaning). Importantly, LSS is not simply a measure of lexical similarity (i.e., whether the same words are used)—instead, it uses contextual information (i.e., how words are used in relation to other words) to assess whether words are used *in the same way* and *mean the same thing*. For example, as explained by Arnulf, Larsen, Martinsen, and Bong (2014), the phrases "Doctors operate on patients" and "Physicians do surgery" would score high on LSS (.80) but low in lexical similarity (they have no words in common). Further, we selected LSS because it is a better indicator of shared meaning than other widely used linguistic measures, such as language style matching, which compares the use of each partner's function words (Ireland & Pennebaker, 2010; see Babcock et al., 2014 for a comparison of the two). To calculate LSS, we transcribed the video-recorded conversations of each dyad. For each of the three questions they discussed, we split the transcript into separate blocks of text spoken by each partner. We then computed the LSS index for each question they discussed and averaged these into a final LSS index of dyadic latent shared meaning (see Table 6 for descriptive statistics).

Table 6
Descriptive Statistics for Outcome Variables (Study 4)

Outcome variable: Shared Reality Reaffirmation Behavior	*M*	*SD*
10-min conversation		
Latent semantic similarity (LSS)	0.91	0.03
SR-G behavioral signatures	3.83	1.16
Dyad-specific references	1.15	1.20
Joint decision-making task		
Developing a joint perspective	3.79	1.28
Effort for joint decision satisfaction	4.26	1.26
Participation in decision process	3.95	1.25
Decision satisfaction	4.02	1.06

Note. SR-G = generalized shared reality.

Word count (control variable). Latent semantic similarity can be influenced by word count (Babcock et al., 2014). We therefore measured the word count of couples' conversations to ensure that LSS scores could not simply be explained by length of conversation. We automated the word counting process using the Linguistic Inquiry and Word Count Software (Pennebaker, Booth, Boyd, & Francis, 2015).

Observational coding. Three independent observers, blind to hypotheses, condition, and any self-report measures, coded how frequently each dyad displayed the behaviors described below (see Table 6 for descriptive statistics of focal outcome variables). The order of videos was randomized for each observer. Observers first coded the 10-min conversation about the images, and then coded the joint decision-making task. ICC estimates were calculated

[18] We also included several of these measures after the manipulation and shared viewing experience (but before the discussion): SR-G, relationship satisfaction, relationship-specific identification, IOS, responsiveness, intimacy, perceived similarity. The items were the same as those in the pre-survey. Experimental condition did not predict these variables (nor did the interaction of baseline SR-G and experimental condition).

based on a consistency, two-way mixed effects model (Koo & Li, 2016).[19]

SR-G behavioral signatures [10-min conversation] (α = .98). We used the four-item coding scheme from Study 3 (vocalizing thought similarity, vocalizing agreements or shared feelings, saying things nearly at the same time, and finishing each other's ideas—see Appendix B for details and examples). Observers rated the extent to which couples displayed these behaviors during their conversation about the images. Their ratings were averaged to create a composite score (*ICC* = .81).

References: Dyad-specific, personal, and generic [10-min conversation]. Observers counted the number of references that each participant made during the portion of the conversation participants had in answer to the question, "What did the images remind you of?" that were categorized as (a) *dyad-specific*, that is, references shared by both partners but that did not seem to be shared by other people (e.g., a trip they took together or an inside joke; *ICC* = .71), (b) *personal*, that is, only held by one partner (e.g., an experience had without the partner; *ICC* = .49), or (c) *generic*, that is, that most people would have (e.g., a common cultural reference; *ICC* = .75). We hypothesized that participants high on SR-G in the low (vs. high) overlap condition would make more dyad-specific references, but not more personal or generic references (See the online supplemental materials for details and examples).

Positivity [10-min conversation] (control variable; α = .80). Observers rated how positive versus negative the tone of the interaction was overall (1 – *very negative [dull, slow, tense, argumentative]*; 7 – *very positive [upbeat, engaging]*), and how much affection the couple showed toward each other (1 = *not at all*; 7 = *very much*). The two items were averaged to form a positivity index (*ICC* = .76).

Joint decision-making task (image selection). Observers rated the joint decision-making task on several variables. The dyad-level variables included: (a) developing a joint perspective (1 = *not at all*, 7 = *very much*; *ICC* = .57) and (b) trying to maximize joint decision satisfaction (i.e., trying to find a choice they would *both* be happy with as opposed to focusing solely on either their own or their partner's interests; 1 = *not at all*, 7 – *very much; ICC* = .59). The individual-level variables (rated separately for each partner) included: (a) actively participating in the decision-making process (e.g., voicing an opinion, making suggestions; 1 = *not at all active*, 7 = *extremely active*; *ICC* = .55), and (b) decision satisfaction at the end of the task (1 = *indifferent*, 7 = *extremely satisfied*; *ICC* = .49). This latter variable is not a shared reality reaffirmation behavior per se, but we included it as a secondary outcome since we theorized that it might emerge as a consequence of the shared reality reaffirmation behaviors.

Results

Analysis strategy. To investigate interaction effects, we entered baseline SR-G, experimental condition, and their interaction as simultaneous predictors. Our predictor of interest was the interaction of SR-G and experimental condition. Next, we performed general linear hypothesis tests to examine the difference between the experimental conditions at different levels of baseline SR-G. Specifically, we assessed whether differences as a function of experimental condition emerged for participants 1 *SD* above the mean on SR-G, but not for those 1 *SD* below the mean on SR-G. We predicted that among participants 1 *SD* above the mean on SR-G, those who received low (vs. high) sensory overlap feedback would exhibit significantly greater shared reality reaffirmation behaviors.

Table 7
Parameter Estimates for the Interaction Term of Baseline SR-G and Experimental Condition Predicting Shared Reality Reaffirmation Behaviors (Study 4)

Dependent variable	β	95% CI	*t* value	*p* value
Shared reality reaffirmation behaviors				
10-min conversation				
Latent semantic similarity (LSS)	.80	[.42, 1.19]	4.18	<.001
SR-G behavioral signatures	.43	[.02, .84]	2.10	.038
Dyad-specific references	.38	[.08, .69]	2.46	.015
Joint decision-making task				
Developing a joint perspective	.43	[.02, .84]	2.11	.038
Effort for joint decision satisfaction	.43	[.03, .83]	2.11	.037
Participation in decision process	.54	[.18, .90]	2.94	.004
Decision satisfaction	.41	[.08, .75]	2.43	.016
Other behaviors				
Generic references	.05	[−.28, .39]	0.31	.758
Personal (nonshared) references	.19	[−.10, .47]	1.28	.203
Positivity (tone, affection)	.20	[−.22, .62]	0.93	.353

Note. SR-G = generalized shared reality. In each analysis, both SR-G and the outcome variable are standardized, and condition is dummy-coded (0 = high, 1 = low). Baseline-SRG interacted with experimental condition to predict all shared reality reaffirmation behaviors (but not other behaviors). For the LSS result specifically, to ensure that this result was not just reflecting different conversation lengths, we ran the same analysis adjusting for word count. The interaction of baseline SR-G and experimental condition on LSS remained significant β = 0.54, 95% CI [0.20, 0.87], *t* = 3.13, *p* = .002.

We conducted analyses investigating dyad-level outcomes at the dyad-level (i.e., each predictor variable was averaged for each dyad) and we standardized continuous predictors and outcomes. We conducted analyses investigating individual-level outcomes using multilevel modeling to nest participants within-dyad, thus, we standardized predictors using the residual standard deviation (after removing the dyad-level component from the variance).

Manipulation check: Being on the same "wavelength" during shared image-viewing experience. There was a main effect of experimental condition (low vs. high sensory experience overlap feedback) on participants' perceptions of how much they overlapped in the way they experienced the shared image-viewing task (β = −.44, 95% CI [−.78, −.09], *t* = −2.47, *p* = .016). Participants in the low condition (*M* = 3.79, *SD* = 1.17) felt that they were less on the same wavelength and overlapped less in sharing the experience than those in the high condition (*M* = 4.29, *SD* = 1.38). These results show that the manipulation was sufficiently strong to influence the extent to which participants felt that they overlapped in their experience of a new activity after the manipulation. SR-G did not interact with condition to predict this effect.

[19] Note that for two secondary variables (personal references and decision satisfaction) the ICC scores fell just below the .50 threshold of moderate agreement (Koo & Li, 2016). However, ICC scores were above this threshold for all focal variables of interest (reported throughout).

Table 8
General Linear Hypothesis Tests Examining the Difference Between Experimental Conditions at 1SD Above and Below the Mean on Baseline SR-G (Study 4)

Dependent variable	+1 *SD* higher on baseline SR-G				−1 *SD* lower on baseline SR-G			
	β	95% CI	*t* value	*p* value	β	95% CI	*t* value	*p* value
10-min conversation								
Latent semantic similarity (LSS)	1.11	[0.59, 1.64]	4.20	<.001	−0.50	[−1.04, 0.05]	−1.82	.072
SR-G behavioral signatures	0.67	[0.10, 1.23]	2.35	.021	−0.20	[−0.78, 0.38]	−0.69	.495
Dyad-specific references	0.56	[0.07, 1.05]	2.24	.027	−0.20	[−0.70, 0.29]	−0.81	.421
Joint decision-making task								
Developing a joint perspective	0.73	[0.17, 1.29]	2.60	.011	−0.13	[−0.71, 0.45]	−0.45	.654
Effort for joint decision satisfaction	0.83	[0.28, 1.39]	2.98	.004	−0.03	[−0.61, 0.55]	−0.10	.922
Participation in decision process	0.84	[0.16, 1.52]	2.40	.018	−0.23	[−0.92, 0.45]	−0.66	.507
Decision satisfaction	0.44	[−0.11, 1.00]	1.55	.123	−0.38	[−0.95, 0.18]	−1.32	.188

Note. SR-G = generalized shared reality. In each analysis, both SR-G and the outcome variable are standardized and condition is dummy-coded (0 = high, 1 = low). Dyads high in baseline SR-G who received feedback that they had low (vs. high) overlap in their experience of the sensory world displayed these behaviors to a greater extent (also see Figures 4 and 5). For example, among couples 1 *SD* unit above the mean on SR-G, those in the low condition were 1.11 *SD* units higher on LSS than those in the high condition. We did not find this pattern for dyads low on baseline SR-G. We theorized that decision satisfaction would be a secondary outcome of the other reaffirmation behaviors—although the interaction was significant for this variable, the difference between conditions among those higher on SR-G was not.

Mood (PANAS) – control variable. The effect of experimental condition (low vs. high sensory experience overlap feedback) was nonsignificant for positive (β = −.21, 95% CI [−.56, .14], $t = -1.16$, $p = .249$) and for negative mood ($b = .00$, 95% CI [−.29, .29], $t = .02$, $p = .988$). Because our experimental condition did not affect participants' mood, mood is unlikely to explain any differences caused by our experimental manipulation.

Shared reality reaffirmation behaviors. To examine the interaction of baseline SR-G (measured during the presurvey) and the experimental manipulation, we simultaneously entered baseline SR-G, condition, and their interaction to predict each behavior. The interaction of SR-G and condition significantly predicted each shared reality reaffirmation behavior. In contrast, SR-G did not significantly interact with condition to predict behaviors nonrelevant to shared reality reaffirmation (e.g., making generic references, positivity of interaction; see Table 7).[20]

SR-G uniquely interacted with condition to produce these effects. SR-G was the only relationship variable that significantly interacted with condition to predict SR-G behavioral signatures, dyad-specific references, developing a joint perspective, effort for joint decision satisfaction, and ultimate decision satisfaction. For LSS and participation in image selection, SR-G explained the effect of any other variable that also significantly interacted with condition.[21]

To examine these interactions, we performed general linear hypothesis tests to examine the difference between experimental conditions at different levels of baseline SR-G (see Table 8 and Figures 4 and 5). The manipulation had a significant effect on the shared reality reaffirmation behaviors for dyads with SR-G scores 1 *SD* above the mean, but nonsignificant effects for dyads with SR-G scores 1 *SD* below the mean. Specifically, among dyads +1 *SD* higher in baseline SR-G, those who received false feedback that they had low (vs. high) sensory overlap displayed greater efforts to reaffirm their SR-G during their conversation. In contrast, we did not find this effect of feedback among dyads −1 *SD* lower on SR-G. Together, these results support our prediction that among dyads higher in baseline SR-G, those in the low (vs. high) condition would exhibit greater reaffirmation behaviors.[22]

Discussion

In this study, couples were randomly assigned to receive feedback that they had either low (vs. high) overlap in the way they experience the sensory world (relative to the average couple). The way couples behaviorally reacted to the manipulation once reunited differed depending on their baseline level of SR-G. Couples high in baseline SR-G who were assigned to the low (vs. high)

[20] Because of technical issues, we did not record videos for two dyads, so analyses involving videos or transcripts have a final N of 183. Also, because of experimenter error, one of the dyads did not complete the joint decision-making task, so our final *N* for analyses involving those variables is 181.

[21] Only two other variables significantly interacted with condition to predict any of the shared reality re-affirmation behaviors. IOS significantly interacted with condition to predict LSS, (β = .45, 95% CI [.04, .86], $t = 2.16$, $p = .033$). However, when we simultaneously entered this interaction with the interaction of SR-G and condition, only the interaction between SR-G and condition remained significant (SR-G × Condition: β = .75, 95% CI [.32, 1.17], $t = 3.50$, $p < .001$; IOS × Condition: β = .15, 95% CI [−.28, .58], $t = .70$, $p = .488$). IOS did not interact with condition to significantly predict any other reaffirmation behavior. Additionally, Identification interacted with condition to predict Participation in Image Selection (β = 0.45, 95% CI [0.09, 0.80], $t = 2.48$, $p = .014$). However, when we simultaneously entered this interaction with the interaction of SR-G and condition, neither interaction term remained significant (SR-G × Condition: β = 0.35, 95% CI [−0.08, 0.79], $t = 1.62$, $p = .107$; Identification × Condition: β = 0.29, 95% CI [−0.14, 0.71], $t = 1.38$, $p = .170$). Identification did not interact with condition to significantly predict any other outcome variable.

[22] To confirm that no other pattern of results emerged consistently in these interactions, we also conducted exploratory simple slopes analyses to examine the effect of SR-G in the low and high conditions, for which no consistent pattern emerged (see the online supplemental materials). This suggests that our predicted contrast between the low *vs.* high conditions at higher levels of baseline SR-G is the most consistent finding across the interactions.

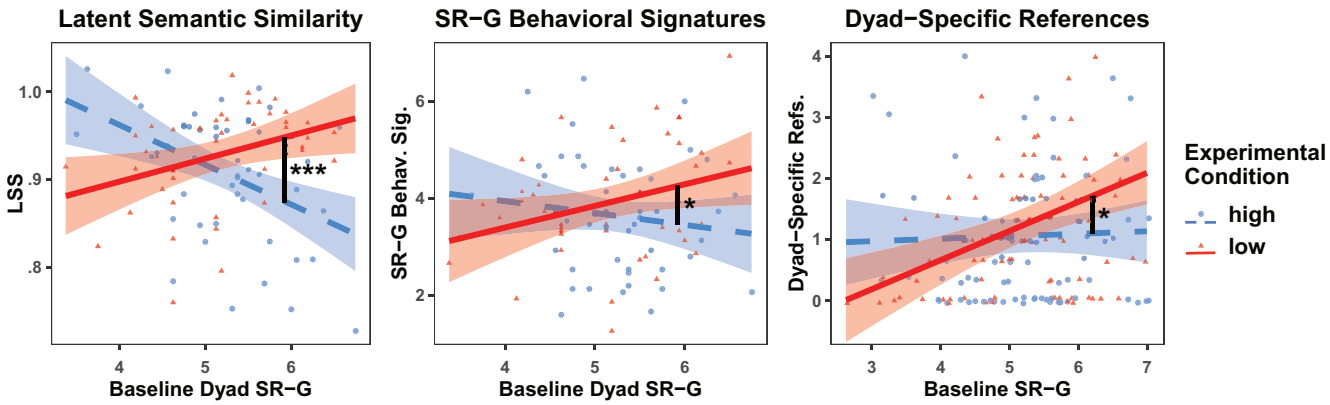

Figure 4. In Study 4, baseline SR-G significantly interacted with experimental condition to predict shared reality reaffirmation behaviors during a subsequent conversation. Specifically, among dyads higher in baseline SR-G, those who received false feedback that they had low (vs. high) sensory overlap displayed greater efforts to reaffirm their SR-G in a subsequent conversation. LSS and SR-G Behavioral Signatures were dyad-level variables, and Dyad-specific References an individual-level variable. Asterisks indicate the significance of the difference between experimental conditions at 1SD above the mean on baseline SR-G (* $p < .05$. ** $p < .01$. *** $p < .001$). See the online article for the color version of this figure.

sensory overlap feedback condition exhibited the following behaviors to a greater extent during their conversation: they created greater latent shared meaning linguistically, exhibited more behavioral signatures of SR-G, made more dyad-specific references (but not more personal or generic references), and appeared to create more shared reality during a subsequent joint decision-making task (e.g., developed a joint perspective, tried to find a choice with which they would both be happy). This pattern was not found among couples lower in baseline SR-G. These findings suggest that, in the face of feedback challenging their sense of SR-G, couples high in baseline SR-G used the conversation to reaffirm their sense of thinking about and experiencing the world in the same way.

Importantly, SR-G was the only close relationship variable to interact with experimental condition to predict these reaffirmation behaviors. Thus, participants' baseline level of SR-G best predicted the extent to which they displayed dyadic behaviors to reaffirm their sense of SR-G in the face of feedback challenging their perception of experiencing the sensory world in the same way. These results show that compared with other relationship constructs, SR-G is uniquely sensitive to feedback about the extent to which a couple sees the external world in the same way. Importantly, they also show that couples are motivated to uphold and reaffirm their SR-G in the face of threat.

Further, we found that SR-G interacted with experimental condition to predict *shared reality* reaffirmation behaviors specifically, and not relationship reaffirmation behaviors more generally. For example, SR-G did not interact with experimental condition to predict the positivity (i.e., tone and affection) of the conversation. These results suggest that these couples were specifically trying to reaffirm their sense of shared reality and not their sense of relationship satisfaction or quality, or the general positivity of their interaction.

In addition to highlighting the conceptual distinctiveness of the construct, these results also show that even though the wording of the SR-G items does not explicitly specify targets that are external to the relationship ("We share the same thoughts and feelings about *things*"), participants are including external targets in their interpretation of the items. If participants were interpreting "things" to mean "the relationship," then SR-G would not have been sensitive to a manipulation specifically about the external world.

As predicted, these reaffirmation behaviors were enacted dyadically, through interaction. We did not find evidence that participants enacted in reaffirmation of SR-G individually (e.g., reporting higher relationship quality as a compensatory mechanism; see Auger et al., 2016 for an example of individual compensation). Instead, participants reaffirmed their sense of SR-G in an interaction with their partner. As mentioned in the introduction, SR-G fundamentally involves the perception of the *dyad's* experience of the relationship—as such, partners needed to reaffirm their sense of SR-G *together*, which was not possible until they were given the chance to interact.

One potential alternative explanation for these results is that among couples high on SR-G, the differences between those in the low versus high sensory overlap feedback conditions are driven by efforts of those in the *high* condition to distance themselves from their partner and down-play their similarity to restore their sense of personal distinctiveness (see Slotter, Duffy, & Gardner, 2014). However, if this theorizing were correct, we would expect couples high on SR-G in the high (vs. low) sensory overlap feedback condition to make more *personal* references that they did *not* share with their partner—an effect we did not find. Instead, we found that those high on SR-G in the low (vs. high) condition made more *dyad-specific* references.

The finding that participants high on SR-G in the low sensory overlap feedback condition made more dyad-specific references during their conversation demonstrates the importance of associations that dyad-partners exclusively share with each other (and not with other people) in the experience of SR-G. We did not find this effect for either personal (nonshared) references or generic references shared by most people. These results demonstrate that close partners create a dyadic sense of

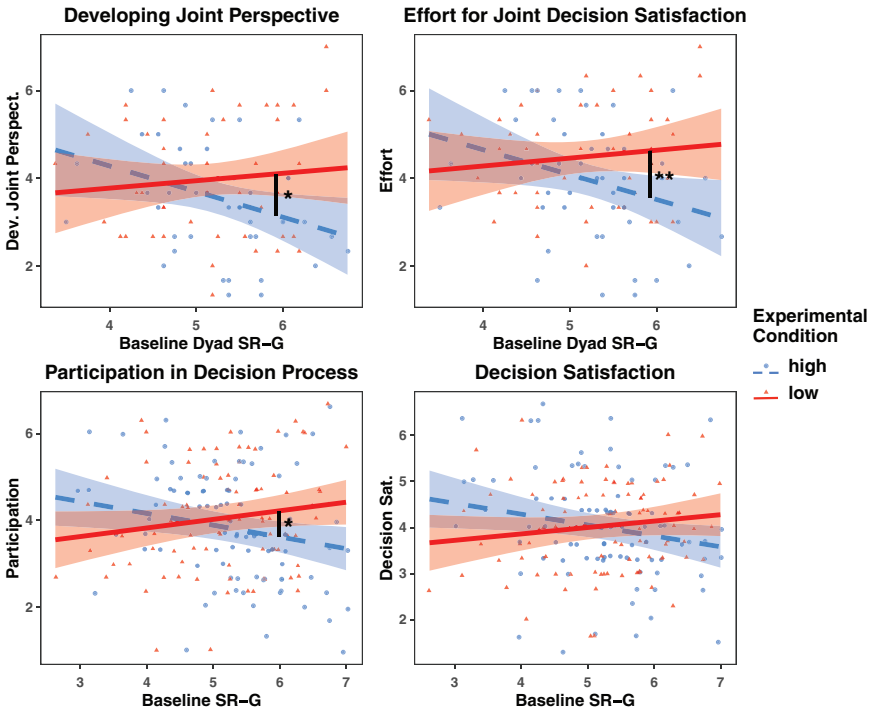

Figure 5. In Study 4, baseline SR-G significantly interacted with experimental condition to predict these shared reality reaffirmation behaviors during a joint decision-making task. Specifically, among dyads higher in baseline SR-G, those who received false feedback that they had low (vs. high) sensory overlap displayed these behaviors to a greater extent. Developing a Joint Perspective and Effort to Maximize Joint Decision Satisfaction were dyad-level variables, and Participation in the Decision Process and Decision Satisfaction were individual-level variables. Asterisks indicate the significance of the difference between experimental conditions at 1SD above the mean on baseline SR-G (* $p < .05$. ** $p < .01$). See the online article for the color version of this figure.

shared reality that is nonredundant with a larger culturally held worldview, and that includes elements that are unique and special to their relationship.

General Discussion

Across nine studies using varied methodologies (daily diary studies, experimental paradigms, dyadic interactions) and varied measurements (self-report, behavioral coding, computational linguistic analyses), we examined generalized shared reality (SR-G) in close relationships and between new acquaintances. We found that SR-G predicted both relational and epistemic variables, and that dyads higher on SR-G exhibited particular behavioral signatures in their interactions. We also found that in the face of feedback challenging their sense of SR-G, romantic dyads exhibited motivated, dyadic interaction behaviors to reaffirm their sense of SR-G. These results make several contributions to the interpersonal relationships literature and to the shared reality literature, and open new directions for future research.

Contribution to Interpersonal Relationships Literature

This work identified SR-G as a new theoretical perspective and methodological tool for examining the phenomenology of interpersonal interactions. Thinking of things at the same time, seeing the world in the same way, and finishing each other's sentences are common themes in lay descriptions of interpersonal interactions, yet no research has conducted theory-driven investigations of these experiences. In the present work, we developed a self-report measure and a behavioral coding scheme to examine this phenomenon both between strangers and close partners, and distinguished SR-G conceptually and empirically from other constructs.

Our results suggest that SR-G plays an important role in initial interpersonal interactions between strangers. Colloquial descriptions of relationship initiation often invoke the idea of "clicking", yet little work has explored the factors contributing to this experience. We found that SR-G predicted "clicking" between strangers, as well as closeness, rapport, and the desire to interact again. These effects held over and above the effects of perceived similarity, perceived partner responsiveness, and IOS, which are commonly used to examine the development of initial closeness (Aron et al., 1997; Birnbaum & Reis, 2012; Montoya & Horton, 2013). These findings may partially account for why shared inner states, such as shared emotional responses and shared amusement, foster social connection (Kurtz & Algoe, 2017; Pinel et al., 2006; Sels, Ruan, Kuppens, Ceulemans, & Reis, 2020; Treger, Sprecher, & Erber, 2013), and why descriptions of being "on the same wavelength" feature so commonly in lay accounts of relationship initiation. Perhaps SR-G plays an important role in sparking new relationships and in the experience of falling in love.

In addition to identifying SR-G as a key predictor of initial human connection, our results suggest that SR-G may also be an important aspect of ongoing interpersonal relationships. We found that on days when partners experienced greater SR-G, they felt more connected to their partners. People with greater SR-G tended to be closer and more committed to their romantic partners, and more likely to have experienced the feeling of having "merged minds." Critically, this work identified SR-G as a feature of relationships that close partners are motivated to uphold. Specifically, when we experimentally challenged couples' sense of experiencing the sensory world in the same way, those high in baseline SR-G engaged in motivated interaction behaviors to reaffirm their SR-G—such as vocalizing agreement, finishing each other's ideas, making more dyad-specific references, and establishing greater latent shared meaning at the linguistic level. They also appeared to create greater shared reality during a subsequent joint decision-making task. Importantly, SR-G was the only relationship construct to predict these reaffirmation behaviors in response to this threat. These findings suggest that SR-G matters enough to close partners that they are motivated to reaffirm it together in the face of threat.

Future work could build on these results to examine the effects of SR-G on long-term relationship outcomes. As theorized by Rossignac-Milon and Higgins (2018b), through the process of developing a strong sense of "what we think and feel about the world," partners may establish a strong sense of "we"-ness and shared identity. The writings of phenomenologist Merleau-Ponty support this idea. As quoted by Crossley (1996) and Ickes and colleagues (2004); Merleau-Ponty (1945) described the intersubjective phenomenology of the "double being," in which two individuals create a shared world to such an extent that they come to "grasp the other's thoughts the moment they come into being" (p. 33). He theorized that this experience of blended consciousness provokes transcendence of the self-other distinction. Thus, perhaps the experience of SR-G could help explain how the conversations close partners have about the world around them contribute to the sense of "we-ness" and shared identity, which predicts commitment, relationship-maintenance processes, and relationship longevity (Agnew et al., 1998; Aron et al., 1992; Karan, Rosenthal, & Robbins, 2019; Linardatos & Lydon, 2011; Walsh & Neff, 2018).

These findings begin to address a research direction recently called for by relationship scholars: studying phenomena in which dyads jointly attend to the world *outside* of their relationship (Clark et al., 2008). Most relationship constructs involve perceptions of the partner, the self, or the relationship itself. However, people frequently discuss objects external to their relationship (Alberts et al., 2005; Woods et al., 2016)—for example, "What was your take on the movie?" or "What do you think of this color?" In the spirit of Berscheid (1995), we intentionally studied everyday conversations (e.g., about ordinary objects and sensory experiences), allowing us to directly examine the importance that partners place on experiencing the external world in the same way. Our results suggest that part of the beneficial effects of shared activities for close partners (Aron, Norman, Aron, McKenna, & Heyman, 2000; Berscheid et al., 2004; Boothby et al., 2017; Garcia-Rada et al., 2018; Girme et al., 2014; Min, Liu, & Kim, 2018; Woods et al., 2016) may stem from coattending to the world external to the relationship, allowing them to create a sense of SR-G. Given this, interventions could be designed to shift partners' attention from themselves and their partner to the external world (e.g., focusing on exploring a new space or a novel object together, or on sensory features of their surroundings) to foster SR-G and allow partners to fully savor their experiences and feel more connected to each other.

In addition, these results highlight the epistemic function of interpersonal relationships. Creating SR-G in conversation predicted epistemic outcomes, such as certainty, epistemic trust, and joint sense-making. Further, in response to feedback threatening their sense of SR-G, dyads high on baseline SR-G created greater latent shared meaning in conversation. These results suggest that close relationships may contribute to meaning in life not only because being in a satisfying relationship allows people to fulfill a normative societal expectation (Murray, Lamarche, & Seery, 2018), but also because close partners co-create shared meaning and certainty in their conversations about the world (see also Andersen & Przybylinski, 2018).

Future research could examine whether, beyond relational commitment, close partners experience a sense of *epistemic commitment*, that is, loyalty to their shared worldview. Epistemic commitment could have trade-offs. For some, it could lead to an insular reality, in which partners fervently guard their shared perspective from contradictory views, at the risk of disconnecting from objective reality (as an extreme example, see *folie à deux:* shared delusion and joint psychosis; Lasègue & Falret, 2016). Similarly, people may be reluctant to terminate otherwise unsatisfying or unhealthy relationships for fear of betraying their shared worldview and losing this haven of epistemic certainty. For others, to borrow from the attachment literature (Feeney & Thrush, 2010), a strong sense of shared reality with a close partner may function as an epistemic "secure base," from which they can openly explore novel perspectives and ideas. This idea is supported by research showing that close partners can promote intellectual humility, curiosity, and openness (Mikulincer & Shaver, 2007; Reis, Lee, O'Keefe, & Clark, 2018).

Finally, little work has examined the effects of sharing something *exclusively* with a close partner. In this work, we found that when given the chance to interact with each other after receiving feedback threatening their sense of SR-G, partners high on baseline SR-G made more dyad-specific references, such as inside jokes, shared memories, or associations shared uniquely with each other (but not more generic references). This finding is consistent with work showing the beneficial effects of developing dyad-specific words and phrases (Bell et al., 1987) and finding dyad-specific meaning in particular objects (e.g., "our song"; Harris et al., 2019). Though anecdotal evidence abounds that "inside jokes" are an important part of close relationships, little is known about their role in relationship development and maintenance. As theorized by Rossignac-Milon and Higgins (2018b), we propose that these processes constitute an important part of co-creating a dyad-specific subculture: shared ways of thinking, talking, and interacting that are unique and special to a relationship. Future work could leverage these ideas to design interventions to help dyads develop their idiosyncratic subculture.

Contribution to Shared Reality Literature

Though shared reality researchers have long assumed that shared reality contributes to relational and epistemic outcomes

(Hardin & Higgins, 1996; Echterhoff, Higgins, & Levine, 2009), this research was the first to explicitly test these links. We found that conversation partners who experienced greater shared reality felt closer to each other and more certain of their perceptions. Future research could test the potentially mutual influence of these variables—perhaps shared reality enhances closeness and certainty, which in turn further enhance shared reality.

Further, prior research has primarily examined shared reality about particular target referents, such as a third person or an event (for a review, see Echterhoff & Higgins, in press). In contrast, we demonstrated the existence of SR-G, which involves inner states about the world in general. SR-G predicted relational and epistemic variables over and above target-specific shared reality, suggesting that the link between SR-G and these variables cannot be accounted for by sharing inner states about a particular target. This new construct therefore represents a significant extension of previous work on shared reality.

Although shared reality is theorized to develop mainly in conversation (Hardin & Conley, 2001; Hardin & Higgins, 1996), shared reality research has been conducted predominantly using a paradigm in which participants send a single written message to a fictitious partner, without actually conversing (see Higgins, 2019 for a review). Heavy reliance on this methodology has obscured the ways in which shared reality manifests in real-world conversations. We examined shared reality in ecologically rich settings, allowing us to examine the conversational dynamics of shared reality creation both between strangers and close partners.

Through this work, we developed several methodological tools we believe will be useful for future research on shared reality. First, we developed self-report measures of SR-G, for use between new acquaintances and close partners alike. These measures can be used to examine generalized shared reality either in a given situation (e.g., "During our interaction, we thought of things at the same time") or as a chronic feature of relationships (e.g., "We typically think of things at the same time"). Second, we developed an observational coding scheme to examine the dyadic behavioral signatures of SR-G, such as vocalizing shared thoughts or finishing each other's ideas. Finally, we used computational linguistic analyses to examine Latent Semantic Similarity (Babcock et al., 2014) as another indicator of shared reality creation. This work identified LSS as a scalable tool for shared reality researchers to investigate shared reality in a given conversation. We hope these tools will encourage researchers to examine shared reality in naturalistic contexts and in real-time conversations.

We found that newly acquainted dyads who exhibited greater behavioral signatures of SR-G in their conversations (e.g., finishing each other's ideas) reported a greater sense of SR-G. These findings suggest that people may infer from these behavioral cues that they see the world in the same way. Critically, these behavioral signatures predicted relational outcomes to the extent that they were subjectively experienced by the participants as SR-G. These findings identify SR-G as one potential mechanism through which these types of conversational dynamics contribute to social connection (Koudenburg, 2018; McFarland et al., 2013).

Further, we found that in close relationships, people develop a sense of shared reality that is strong enough that they are motivated to reaffirm it in the face of threat. Future research could examine whether the mechanisms underlying shared reality creation differ for close partners than strangers. Prior work on the "saying-is-believing" effect in shared reality has found that in communication, people tune not only what they *say*, but what they subsequently *remember*, to match their communication partner's attitudes (see Higgins, 2019 for a review). Perhaps in close relationships, epistemic and relational trust are high enough that saying-is-believing occurs without the need for message production (as with group audiences; Higgins, Echterhoff, Crespillo, & Kopietz, 2007). It is also possible that in close relationships, partners are so familiar with each other's views that merely *imagining* a partner's reaction to one's thought suffices for memory tuning to occur, thereby accelerating the rate at which close partners converge in their cognitive representations. Over time, close partners may develop the same chronically accessible constructs, merging their mental models of the world. Examining such processes would elucidate the cognitive underpinnings of having "merged minds."

Future Directions

Future work could explore the role of SR-G in other areas of psychological science. For example, perhaps SR-G can help explain the emergence of various forms of interpersonal synchrony in conversation. Researchers have theorized that synchrony is multimodal, such that different forms of synchrony often occur in tandem (Cacioppo et al., 2014; Shamay-Tsoory, Saporta, Marton-Alper, & Gvirts, 2019; Wheatley, Kang, Parkinson, & Looser, 2012). What factors lead people to synchronize their neural responses (Liu et al., 2018), their physical movements (Mogan, Fischer, & Bulbulia, 2017), and their physiology (Timmons, Margolin, & Saxbe, 2015)? Perhaps synchrony is especially likely to emerge when conversation partners find themselves experiencing SR-G and thinking of things at the same time (i.e., experiencing cognitive synchrony). This idea is supported by work showing that close friends and romantic partners display greater neural synchrony than strangers (Kinreich, Djalovski, Kraus, Louzoun, & Feldman, 2017; Parkinson, Kleinbaum, & Wheatley, 2018), and that developing a joint perspective is associated with greater interactional synchrony (Chartrand & Lakin, 2013; Marsh, 2010). Future work could investigate whether cognitive synchrony can provoke neural, behavioral, and physiological synchrony. Perhaps in synchronizing the movements of their minds, people come to synchronize the movements of their brains and bodies.

This work also suggests that SR-G may play an important role in certain social contexts, such as organizations. We found that newly acquainted partners who experienced greater SR-G during a joint task expressed a greater desire to work together again. Perhaps SR-G can spark collaborations between potential colleagues. In addition to initiating work relationships, SR-G may yield relational and epistemic benefits to organizations. For example, perhaps SR-G can promote close ties at work, which can increase job satisfaction, productivity, and organizational commitment (Baruch-Feldman, Brondolo, Ben-Dayan, & Schwartz, 2002; Riordan, 2013). SR-G may also yield epistemic benefits, such as meaning at work (Rosso, Dekas, & Wrzesniewski, 2010), which often stems from interpersonal sensemaking (Wrzesniewski, Dutton, & Debebe, 2003). Further, SR-G may foster mutually shared cognition and co-construction of meaning, which are central to team collaboration (Van den Bossche, Gijselaers, Segers, Woltjer, & Kirschner, 2011). Future work

could examine these potential benefits of SR-G in the workplace.

The subjective nature of SR-G raises interesting questions about the reciprocity and accuracy of SR-G (Gagné & Lydon, 2004). In this work, we found that SR-G corresponded to interaction behaviors that are noticeable to outside observers, suggesting that the experience of SR-G may be grounded in actual events. But because SR-G is inherently a subjective perception, one partner may feel that s/he has a shared reality with the other, when in fact the other partner does not reciprocate that perception. What are the relational repercussions of erroneously assuming the existence of SR-G in a relationship? Can partners reap benefits from an erroneous SR-G so long as their misperception is maintained (e.g., Murray, Holmes, Bellavia, Griffin, & Dolderman, 2002)? What are the interpersonal consequences of realizing that one's SR-G was wrongly assumed? In this article, we presented dyads with feedback challenging their SR-G. Though we found that dyads high on baseline SR-G acted to behaviorally reaffirm their SR-G in subsequent interactions, future research could examine whether this compensatory effect continues in the face of repeated threats to SR-G over time. Perhaps past a certain tipping point, partners stop reaffirming and instead allow the evidence to erode their sense of SR-G. The disintegration of SR-G may play a key role in relationship dissolution and contribute significantly to subsequent suffering: for example, losing one's epistemic companion—a primary source of epistemic validation—may partially explain the drop in self-concept clarity that often accompanies separation (Slotter, Emery, & Luchies, 2014).

Concluding Comment

People often experience a sense of sharing the same thoughts and feelings about the world with close others and even new acquaintances. They finish each other's sentences, think of things at the same time ("Jinx!"), exchange knowing glances, and develop a joint perspective on their experiences ("Listening to *Dark Side of the Moon* together feels like walking through a surrealist painting"). Over time, close partners may even come to feel a sense of having 'merged minds' and of having created their own reality—a shared world that they are motivated to uphold. Whether between close partners or new acquaintances, the experience of generalized shared reality is a critical component of how people connect with each other and make sense of the world.

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(*Appendix follows*)

Appendix A

Generalized Shared Reality (SR-G) Self-Report Measures

SR-G – Cross-Situational (Chronic - For Use Between Familiar Partners)

Please rate your agreement with the following statements about you and your partner. (1 = Strongly disagree, 7 = Strongly agree)

1. We frequently think of things at the exact same time.
2. Through our discussions, we often develop a joint perspective.
3. We typically share the same thoughts and feelings about things.
4. Events feel more real when we experience them together.
5. The way we think has become more similar over time.
6. We often anticipate what the other is about to say.
7. We are more certain of the way we perceive things when we are together.
8. We often feel like we have created our own reality.

SR-G – Interaction-Specific (State - For Use Between Strangers or Familiar Partners)

During our interaction . . .

1. . . . we thought of things at the exact same time.
2. . . . we developed a joint perspective.
3. . . . we shared the same thoughts and feelings about things.
4. . . . our conversation felt very real.
5. . . . the way we thought became more similar.
6. . . . we often anticipated what the other was about to say.
7. . . . we became more certain of the way we perceived things.
8. . . . we saw the world in the same way.

Appendix B

Generalized Shared Reality Behavioral Signatures (Studies 3 and 4)

During their discussion, how frequently did this dyad . . . (1 = Never, 4 = Occasionally (Average), 7 = Very frequently)

Note. Try not to count "instances" of these behaviors - instead, after watching the interaction all the way through, rate your overall sense of how frequently the dyad was exhibiting each type of behavior.

Vocalize Thought Similarity

(e.g., "I was thinking the same thing"; "I was just going to say that"; "you read my mind"; "That's how I think about it too"; "That's exactly what I was trying to say"; "Exactly"; "YES!")

Note. Participants do not need to say these phrases explicitly, as long as their response indicates that their partner seems to have vocalized their thought process (i.e., a thought they already had in their mind). Participants are essentially informing us that they experienced cognitive synchrony (synchronous thought process).

Examples from online conversations between stranger dyads:

A: I think they will pay for their purchase and leave the establishment.

B: That's exactly what I was thinking

A: Comfortable and relaxed

B: Yep. I was going to say happy

(*Appendices continue*)

Example from laboratory conversations between romantic dyads:

A: And there was also one that was nice, but it had too many colors. It was like a landscape thing, it had, like, a sunset, but then there was just too much going on.
B: Yeah, exactly. It seemed like one of those things that's on the Jehovah's Witness, um . . .
A: Yeah, exactly!

A: [Nodding] Yeah, Joseph. Joseph didn't care!
B: Which, I feel like he would do that, in that pond. [Pointing]
A: [Nodding] Oh, god, yes.
B: For sure.

Vocalize Agreements/Shared Feelings

(e.g., "I totally agree"; "So true"; "That's how I feel too"; "That makes total sense"; "You're completely right")

Note. Do not count back-channeling (i.e., saying "yeah," "right," or "mhmm" to indicate listening)—only expressions of actual agreement and sharing the partner's inner state about what they are discussing. Intonation can definitely play into this (e.g., saying "that's true" or "riiight" in an annoyed or skeptical tone can actually convey a lack of agreement).

Examples from online conversations between stranger dyads:

A: Lol yeah, he looks serious. It could always just be a casual bar conversation though
B: TRUE

A: Maybe he just joined the conversation and hasn't sat down yet. Or isn't really engaged in the convo?
B: Yeah, that makes sense.

Examples from laboratory conversations between romantic dyads:

A: The ones I liked. . . . And the dog [laugh]
B: Yeah I agree. The dog was pretty awesome.

A: And . . . you remember there was this contorted—[Hand gesture]—with the—
B: Yeah, I didn't like it.
A: I didn't like it as well.

Say Things (Nearly) at the Same Time

(e.g., near-synchronous exclamations, single-word utterances, phrases, quick repetitions. These need not use same exact words, as long as they are aligned *semantically*, i.e., share the same meaning)

Note. Rate the extent to which partners seemingly think of things at the same time, have the same thought processes and reactions during the conversation, or simultaneously express the same ideas about what they are discussing. In these instances, cognitive synchrony appears to have occurred.

Examples from online conversations between stranger dyads:

A: I think they are talking because the man in the hat is a PI who the man in the hooded shirt has hired.
B: I think that the man with the pipe is a private investigator and the hooded man is telling him about something he wants him to investigate

A: He's the serious one!
B: He's the enforcer

Examples from laboratory conversations between romantic dyads:

B: Um, I'm trying to think . . . oh!
A: Reminds me of Pokemon!
B: Reminds me of Pokemon! Like all things.

A: . . . to look at shitty motivation posters.
B: [Simultaneously] Motivational posters!

(*Appendices continue*)

Finish Each Other's Sentences or Ideas

Rate the extent to which the dyad seems to be riffing off of each other's ideas, that is, sharing one stream of consciousness and really building off each other's thoughts to co-construct a shared understanding (not just explaining their respective perspectives to each other, but building a new understanding together in a fluid way). Note that they can come from different perspectives and initially have different interpretations (or have no opinions)—as long as through their discussion, they seem to be sharing a stream of consciousness as they come to make sense of it and really building off of what the other is saying.

Examples from online conversations between stranger dyads:

A: the empty chair
B: oooh dark!
B: I dig it though
A: seance?
A: hahahaha!
B: damnit carol you forgot the ouijia board?!?!
A: LOL!
B: dear spirits move this chair up into the air if you wish Carol would have brought a ouijia board and made this easier for everyone

A: He is trying to establish dominance in the room, but failing miserably.
B: HAHA
B: No one cares if you stand up, Ted
A: I sort of wish they had faces
B: Me too, I think Ted would be crying
A: The more I look at them the more it creeps me out
B: Yeah.. their little blank faces and nubby hands
B: There is definitely a semblance of distress
A: Oh my god maybe they're about to arm wrestle
B: Right. Ted is about to walk up and show him what's up.
A: Exactly. It's a frat party

Examples from laboratory conversations between romantic dyads:

B: I felt like it was an—a virtual reality image.
A: Exactly, I felt—
B: It was unreal.
A: Yeah, unreal, I felt the same too. Uh, I felt the other thing, there were some boxes with moss over it—
B: Yes.
A: That could—
B: [simultaneously] It could have been real.

A: Or bad book covers!
B: Yeah!
A: Those, the kind you buy at the grocery store 'cause you're going on vacation and it's very—
B: It's like a young adult novel.
A: [Nodding] Yes! Like, "Tommy and the Zombie Apocalypse" [Laughing]

(*Appendices continue*)

Appendix C

Study Materials [Studies 3 and 4]

Study 3: Images and Conversation Questions

Picture 1

1. Why do you think the man in the hooded sweatshirt and the man with the pipe are talking?
2. What do you think will happen next (after the moment in the picture)? Why?
3. Considering what you have discussed, how do you think you would feel in this situation if you were the man in the hooded sweatshirt?

Picture 2

1. What are the people in the picture talking about?
2. Why is the man with black hair standing?
3. Considering what you have discussed, what do you think the mood in the room is like?

Study 4: Sensory Overlap Feedback Manipulation – "Calibrix"

Experimenter script and accompanying survey questions [Script portions are in italics]:

Introduction. *The first thing you'll be doing today is engaging in several different sensory experiences (including vision, touch, and taste) and rating a variety of objects. We ask that you fully engage with each and really get absorbed in the activities. The ipad in front of you will present you with questions about the objects and record your answers. Please try to sit back and keep the ipad in your lap when answering. This set of objects and questions accompanies a software program called Calibrix that was originally developed for marketing purposes and has been recently adapted to study psychological processes by a team of researchers. It's been validated across a number of different labs, including our own. Calibrix uses an algorithm that, based on your answers to these questions, can compute what's called your sensory style - your own way of engaging with and perceiving sensory experiences. Before we move onto instructions, do you have any questions?*

This activity will be a silent one so we ask that, as a part of the standard protocol, you not speak to each other. Please keep your reactions to yourself. The moment we present you with an object, please press the continue button on your ipad. You will have about 20 s to engage with the object and get a feel for your reactions to it. Then, your ipad will auto-advance to questions about the object. You can put the object back on the table while you answer.

Fabrics. *First, we'll look at tactile sensations by feeling some fabrics. Fabrics vary on a few qualities, including softness - how soft or rough it is, and heft - how lightweight or heavy it is. Although these fabrics also vary in color, please focus on their texture instead-specifically on the top side of the fabric.*

[All questions answered on iPad; (1 = *not at all*, 7 = *extremely*)]

Satin. How **lightweight** is this fabric?//How much do you **like** the **texture** of this fabric?

Burlap. How **rough** is this fabric?//How much do you **like** the **texture** of this fabric?

Velvet. How **smooth** is this fabric?//How much do you **like** the **texture** of this fabric?

(*Appendices continue*)

Food. *Next, we'll look at gustatory sensations by sampling some foods. Tastes vary on a few different dimensions, such as flavor—sweet or sour, and texture—chewy or crunchy. Please keep these qualities in mind as you experience each food. These food items were chosen specifically because they contain unique combinations of flavor and texture that are relatively unfamiliar to most palates. Also, they are all vegetarian. We'd like to offer you some hand sanitizer before you begin and we encourage you to wipe your hands on the napkins provided before touching your ipads. We also have some water prepared for you to cleanse your palate between each food. Please remember to remain quiet and keep your reactions to yourself.*

Pretz stick. How **sweet** is this sample? How **crunchy** is this sample? How much do you **like** this sample?

Please take a sip of water to cleanse your palate, and place the paper cup at the front of the table.

Ha flake. How **sour** is this sample? How **dry** is this sample? How much do you **like** this sample?

Lychee gummy. How **sweet** is this sample? How **chewy** is this sample? How much do you **like** this sample?

Colors. *Finally, we'll engage with the visual experience of color perception. Colors vary on a few qualities, like brightness or saturation (which is intensity). Please keep these qualities in mind as you experience each color. Let me know if you have any questions by raising your hand. Remember to remain quiet and to push the object to the front of the table when the iPad prompts you.*

Light blue (color 1) and dark blue (color 2). How **bright** is Color 1[2]? How **saturated** (intense) is Color 1[2]? How much do you **like** Color 1[2]?

Observing both colors. How much **brightness contrast** is there between these colors? How much **saturation (intensity) contrast** is there between these colors? How well do these colors **go together**? How much do you **like** this color combination?

Submission. *All right, now that you have answered questions about each of these different types of objects, you are going to submit your responses to Calibrix. Based on ALL the different sensations you just experienced, Calibrix will compute the similarity of you and your partner's sensory styles. What you'll be seeing is a percentage overlap of your scores - this will indicate how similarly you and your partner experience the sensory world. So for example, if you perceived the objects more similarly, you should see a high percent of overlap in your scores. Research has shown that both similarity and complementarity in sensory styles can have benefits. So it's not necessarily better to be similar or to be different, both can be good.*

You can move on to the next page to submit your responses to the algorithm. We will give you a few moments to quietly read over your results. Just a friendly reminder—please remain quiet and keep your reactions to yourself.

Press SUBMIT to submit your answers to ***Calibrix***.

Calibrix is now using an algorithm to calculate **the similarity of you and your partner's sensory styles** (how similarly you experience the sensory world).

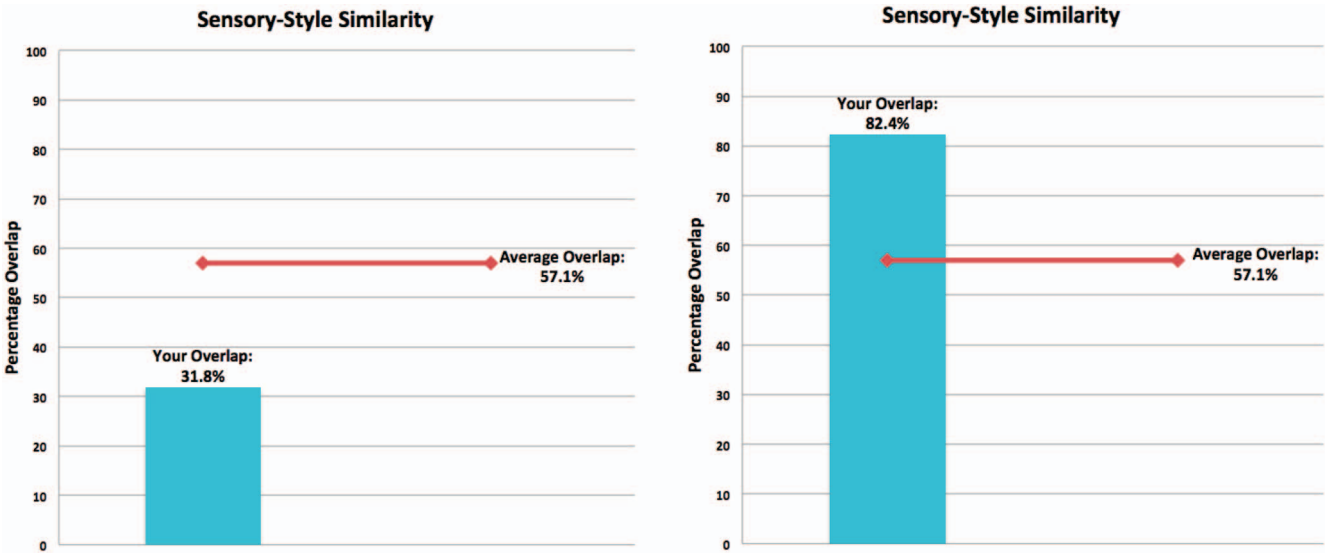
You will receive a **percentage overlap from 0% to 100%** indicating the similarity of your sensory styles.

Please wait . . .

Calibrix Output in Low (Versus High) Sensory Overlap Feedback Conditions

Your score: 31.8% [82.4%]

This score indicates that you and your partner's sensory style similarity **overlaps by** 31.8% [82.4%] (the average overlap is 57.1%).



See the online article for the color version of this figure.

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