Laughter indicates perceived similarity among friends and strangers

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Abstract

Laughter is a signature of social connection, thought to communicate a shared understanding of nonseriousness. Building on this idea, the present work examines whether people laugh more when they perceive similarity with their social partner, or instead, feel more similar when they laugh. Participants (N_{dyads} = 132) had semi-structured conversations with both a friend and a stranger, discussing ways they were similar to and different from one another. Although conversation topic did not affect overall laughter, friends laughed even more than strangers when discussing their differences. A composite of baseline perceived similarity measures predicted how much dyads laughed and colaughed. Participants laughed more if they felt similar to their partner *or* if their partner felt similar to them. Partners who laughed more also expressed more shared reality during their conversations (e.g., saying "I agree") and self-reported greater subjective shared reality afterwards. Laughter and verbal agreement appeared to serve overlapping conversational functions: when laughter occurred, shared reality verbal expressions became less likely in the next two seconds. A subset analysis of friend dyads showed that only *perceived* similarity—not actual similarity—predicted laughter. However, laughter was not associated with subsequent changes in perceived similarity. In sum, conversational laughter reflects a preexisting sense of similarity and shared understanding, both of which underly social connection.

Laughter indicates perceived similarity among friends and strangers

"Laughter is the shortest distance between two people." Attributed to comedian Victor Borge, this quote captures laughter's role in bringing people together. Laughter abounds in social interaction and people seek social partners who make them laugh (Sprecher & Regan, 2002; Treger et al., 2013) and who laugh at similar things (Brauer & Proyer, 2018). People don't just like to laugh; they also enjoy hearing other people laugh (Bachorowski & Owren, 2001). Friends laugh more than strangers (Bryant et al., 2016), and people are likelier to become friends later if their initial interactions involve laughter (Jolink & Algoe, 2023). Laughter is such an inherent signature of friendship that cross-cultural observers, and even babies, can detect whether two people are friends or strangers simply by listening to their laughter (Bryant et al., 2016; Vouloumanos & Bryant, 2019).

People are far more likely to laugh in the presence of others versus alone, regardless of how funny something is (Devereux & Ginsburg, 2001; Dunbar et al., 2021; Provine, 2001), suggesting laughter is less a "read-out" of amusement and more a signal designed to communicate information to social partners (Wood & Niedenthal, 2018). While some laughter is associated with an underlying positive affective state like amusement (Bachorowski et al., 2001; Scott et al., 2014), most laughter in everyday conversation is *not* associated with strong positive affect (Glenn, 2003; Provine, 1993; Vettin & Todt, 2004). What do these lower-arousal chuckles, giggles, and chortles communicate, and why are they still more common among friends than strangers? The present study contributes to growing evidence that conversational laughter is associated with perceived interpersonal similarity (Kurtz & Algoe, 2017; Wood et al., 2022). People laugh when they believe that they understand their partner and when they feel understood by their partner.

Laughter and social bonding

People prefer social partners with whom they can laugh (Campbell et al., 2015; Sprecher & Regan, 2002). Videos and photos of laughing individuals are judged as more likeable than smiling or neutral individuals, even if the laughter is posed (Reysen, 2006). The more people use humor while disclosing information about themselves, the more their partners like them and the closer they feel (Treger et al., 2013). When people think of a hypothetical person with a good sense of humor, they attribute a suite of other socially desirable traits to the person, including being high in agreeableness and emotional stability (Cann & Calhoun, 2001). Some of these attributions may reflect reality: people who are able to laugh at themselves have socially desirable traits like higher well-being, extroversion, and cheerfulness (Beermann & Ruch, 2011; Liao et al., 2024).

Experiencing humor and laughter together helps strangers bond (Dunbar et al., 2021) and makes it likelier that they will become friends (Jolink & Algoe, 2023). Dyads who completed playful activities together, including acting out commercials for products using jibberish words, felt closer to each other afterwards compared to dyads assigned to a non-playful, laughter-less set of tasks (Fraley & Aron, 2004; Treger et al., 2013). Shared laughter may foster a sense of safety that encourages vulnerability. In one study, strangers who watched humorous (vs. neutral) videos together went on to disclose more intimate information to one another (Gray et al., 2015).

Laughter also reflects, and perhaps strengthens, existing close bonds. Friends laugh and colaugh (laugh together) more during conversation than do strangers (Bryant et al., 2016; Smoski & Bachorowski, 2003). The amount of colaughter produced by romantic couples recalling how they first met is correlated with their overall relationship quality (Kurtz & Algoe, 2015). Couples with a fear of being laughed at report lower relationship satisfaction (Brauer & Proyer, 2018).

Simply recalling an instance of shared laughter increases relationship satisfaction more than recalling other positive shared events (Bazzini et al., 2007). Laughter may have spillover effects into other relationships: a two-week daily diary study found that shared laughter with a social partner predicted greater intimacy and enjoyment in participants' next social interaction, even if the next interaction was with a different social partner (Kashdan et al., 2014). This suggests it is not just experimentally induced laughter that relates to social bonding, but also naturally occurring conversational laughter (Dunbar, 2022).

Why people laugh

Laughter's role in social bonding is evolutionarily ancient. Laughter is an evolved play signal (Winkler & Bryant, 2021) shared across species including rats (Panksepp & Burgdorf, 2003), dogs (Simonet et al., 2005), and chimpanzees (Davila-Ross et al., 2011). Social play helps develop cognitive and physical abilities (Pellis & Pellis, 2007) and strengthens existing and future social bonds (Coelho et al., 2017; Von Frijtag et al., 2002). However, play—be it a game of chase or wry repartee—can have negative social consequences if the actions or words are taken literally by one's partner. Play signals communicate social actors' playful, harmless intentions, allowing the play to continue and avoiding escalation into conflict (Bekoff, 1995; Burghardt, 2010). In humans, laughter retains this *nonseriousness* meaning (Gervais & Wilson, 2005).

In many contexts, of course, laughter reflects amusement. Humor theories suggest that amusement arises when people appraise a situation as a *benign violation,* or as something that defies expectations but feels safe (Warren & McGraw, 2015), which is experienced as rewarding (Mobbs et al., 2003). These theories often emphasize that humor depends on shared knowledge: part of what makes a joke funny is that it contains an "encrypted" meaning that only some people

will understand (Flamson & Barrett, 2008). Thus, shared laughter can signal shared understanding of some nonserious incongruity (Gervais & Wilson, 2005), even if it occurs in a serious context (Blasco-Belled et al., 2023; Canestrari et al., 2021).

Yet most laughter in conversation is not a response to jokes (Provine, 2001). People laugh to manage turn-taking, signal affiliation, ease tension, indirectly correct others' behavior, and convey benign intent (Blasco-Belled et al., 2023; Ginzburg et al., 2020; Provine, 1993; Vettin & Todt, 2004). Speakers sometimes laugh to soften a potentially aggressive or vulnerable utterance (Wang et al., 2016), while listeners sometimes laugh to signal alignment with the speaker. This kind of laughter marks the interaction as playful, non-threatening, and mutual (Norrick, 1994; Wood & Niedenthal, 2018).

Laughter and interpersonal similarity

People prefer to bond and play with similar others, a phenomenon known as *homophily* (McPherson et al., 2001). Having a shared background, interests, values, beliefs, and attitudes makes interactions more fluent and makes common ground easier to establish and maintain (Laakasuo et al., 2020). Yet perceived similarity in personality, attitudes, or daily behavior is more predictive of social connection than *actual* similarity (Chadha et al., 2024; Montoya et al., 2008; M. Selfhout et al., 2009). We hypothesize that the more people *perceive* themselves to be similar to a social partner, the more they will laugh with them. Animals (including humans) tend to play when they feel safe and trust their partner (Burghardt, 2010), and perceived similarity to the self is a useful heuristic that someone's behavior will be predictable (Gudykunst et al., 1985) and thus trustworthy (Singh et al., 2017).

It is also easier to be playful with a partner perceived as having similar values, goals, beliefs, and prior experiences, because they will appraise the same things as benign violations. Evidence suggests a shared sense of humor increases feelings of affiliation and altruism towards a partner (Curry & Dunbar, 2013). Friends create humor and laugh together by playing with their shared values, schemas, and attitudes (Knight, 2013)—think of an inside joke, where laughter results from knowing that only a select few have the appropriate shared knowledge to "get it." The subjective experience that another person "gets you," in the sense of having similar feelings, attitudes, and beliefs, is known as *shared reality* (Echterhoff et al., 2009). Shared reality is higher among close partners compared to strangers, and friends attempt to repair shared reality when it is ruptured (Rossignac-Milon et al., 2020).

Colaughter, or laughing at the same time, may be particularly indicative of perceived similarity and shared reality, as it reveals real-time alignment of appraisals and affect (Bryant et al., 2016). For instance, participants who watched funny videos with a confederate felt more similar to them when the confederate laughed at the same videos, compared to when they laughed at different videos or didn't laugh at all (Kurtz & Algoe, 2017). In an experience sampling study (Jolink & Algoe, 2023), first-year undergraduates reported how much shared laughter occurred during encounters with new peers. They then reported on their relationship status with those peers three days later, one week later, and at the end of the semester. First encounters were more likely to lead to future interactions and develop into high-quality relationships if they involved shared laughter, an effect that was statistically mediated by perceived similarity.

Laughter and perceptions of similarity are linked at both trait and state levels. Wood et al. (2022) had participants converse with 10 strangers and used social relations modeling to

disentangle the between-person and within-person similarity-laughter association. At the between-person level, participants whom others generally perceived as more similar tended to elicit more laughter from their partners. At the within-person level, when a participant felt more similar to a partner than usual, they laughed more than usual.

Existing evidence linking laughter to perceived similarity leaves several open questions. Some evidence involves retrospective recall of amount of laughter (Jolink & Algoe, 2023; Studies 1 and 2 of Kurtz & Algoe, 2017), which people tend to underestimate (Vettin & Todt, 2004). Prior studies measured perceived similarity at a single time point (Wood et al., 2022), so the possibility remains that baseline perceived similarity, based either on a relationship history or a first impression, is associated with laughter, rather than laughter being associated with changes in perceived similarity. Study 3 of Kurtz and Algoe (2017) provides the strongest evidence that colaughter causes perceived similarity because they experimentally manipulated colaughter with a confederate. However, that paradigm was focused on laughter in explicitly humorous contexts, whereas most everyday laughter is not a response to something funny (Provine, 2001). Does conversational laughter increase perceptions of similarity in the absence of an external source of humor?

Present work

The present work advances our understanding of the relationship between conversational laughter and perceived similarity. We take a multifaceted approach: we manipulate the salience of similarity through conversation prompts, examine the bidirectional relationship between perceived similarity and laughter, compare the predictive power of perceived versus actual similarity, and assess how laughter aligns with verbal expressions of similarity. In a within-subject design, undergraduate students (N_{dyads}=132) had brief conversations with both a friend

and a stranger. We measured the frequency and total duration of laughter and colaughter in each conversation. To see whether people adapt how much they laugh in response to temporary shifts in perceived similarity, we manipulated the salience of interpersonal similarities/differences by instructing each dyad to discuss the ways in which they thought they were both a) similar to and b) different from one another. The within-person design places participants in multiple conversational contexts with partners of varying levels of intimacy to thoroughly unpack laughter's relationship to perceived similarity. We address the following research questions (RQs):

RQ1: *Does the effect of friendship status (friends vs. strangers) on amount of laughter depend on conversation type (similarities vs. differences conversation)?* Perhaps friends, who perceive themselves as more similar than strangers at baseline, laugh even more when discussing their similarities as a reflection of the heightened salience of similarity. Or perhaps they laugh more when discussing their differences to overcome the temporary interpersonal distance induced by the conversation topic.

RQ2: *Do participants' and partners' pre-conversation perceptions of similarity interact to predict laughter?* While prior work (Wood et al., 2022) found both actor and partner effects, it did not examine whether one person's perceptions of similarity moderated the effect of the other person's perceptions of similarity on laughter. Do both partners need to feel similar for either person to laugh? Or is one person's feeling of similarity sufficient to elicit laughter from both partners?

RQ3: *Is laughter associated with changes in post-conversation perceptions of similarity, controlling for baseline perceptions?* We asked whether people feel more similar to each other after laughing together, controlling for their pre-conversation perceptions of

similarity. Laughter might simply *reflect* existing perceived similarity or it might be associated with *increases* in perceived similarity. This is the first study to distinguish between perceived similarity preceding laughter (RQ2) versus laughter preceding changes in perceived similarity.

RQ4: *Does laughter predict verbal expressions of shared reality?* If both laughter and verbal expressions of shared reality (e.g., finishing a partner's sentence or agreeing with them) signal perceived similarity, then how do they relate to each other (Rossignac-Milon et al., 2020)? We ask this at two levels of analysis: first by calculating conversation-level scores for each variable and comparing conversations, then within-conversation using a lagged time series analysis to see whether one behavior predicts the other 2 seconds later.

RQ5: *Does laughter among friends reflect actual or perceived similarity?* Friends reported their own friendship style and their beliefs about their partner's friendship style, allowing us to calculate both perceived and actual similarity and see which predicts laughter. Although some work connects nonverbal behavior to perceived similarity (Rabinowitch & Knafo-Noam, 2015) *or* actual similarity (Toosi et al., 2012), little research has measured both to investigate which is more predictive of nonverbal behavior during conversation.

By unpacking when and why laughter emerges in conversation, this work reframes laughter not as a mere signal of enjoyment, but as a behavioral indicator of perceived similarity. Understanding how subtle signals like laughter reflect (and potentially reinforce) perceived similarity can offer new insight into how relationships form and how connection is made audible.

Method

We report all procedures and measures, including survey items that we did not include in the present analyses, either here or in the online materials. This study was not preregistered. The complete study materials (including experimenter instructions and behavior coding instructions), processed data, and R code and output are available on the Open Science Framework (https://osf.io/u67gy/?view_only=3f9d9ccf10b9462e9c9077663da67112).

Participants

In spring 2024, we recruited undergraduate students from a mid-Atlantic university psychology participant pool. Students were eligible if they were enrolled in their first psychology course and confirmed they would bring a friend to their scheduled study session. Recruited participants (n = 66) brought a preexisting friend also enrolled at their university to the study session (total N_{dyads} = 132). 42% of participants identified as white, 37% identified as Asian, 10% identified as multiracial, 5% identified as other, 4% identified as Black, and 2% identified as Latinx. 58% of participants identified as cisgender female, 40% identified as cisgender male, and 2% identified as nonbinary.

Two pairs of friends participated in each study session, which lasted 1.5 hours on average. Participants had structured conversations with their friend and with a randomly-assigned member of the other pair (details below), resulting in 66 friend dyads and 66 stranger dyads. We aimed to collect as many friend pairs as feasible in a single semester, with three experimenters facilitating each session – to that end, we did not screen friends for duration or closeness of their relationship. However, choosing to accompany a friend to an in-person study session lasting up to two hours (sometimes early in the morning) does suggest some level of closeness. Although friends varied in their closeness and similarity, they were on average much closer ($F(1, 239) = 860.4$, $p < .001$) and similar ($F(1, 238) = 245.26$, $p < .001$) than the strangers

were after their initial conversation (See Table 1 for group means). 54% of friend dyads were same-race and 39% of stranger dyads were same-race. 70% of friend dyads were same-gender and 39% of stranger dyads were same-gender. All participants were compensated with either course credit or a $20 digital gift card.

Procedure

Two pairs of friends attended each study session. Each friend pair arrived at a separate adjacent testing space so no uncontrolled interaction could occur between strangers. Each participant was randomly matched with a stranger from the other friend dyad. The stranger dyads engaged in an icebreaker conversation, then each participant filled out a pre-conversation survey. One at a time, all dyads (the two friend dyads and the two randomly-assigned stranger dyads) then had conversations about their similarities and differences (order counterbalanced). After all conversations were finished, participants filled out a post-conversation survey (see Figure 1).

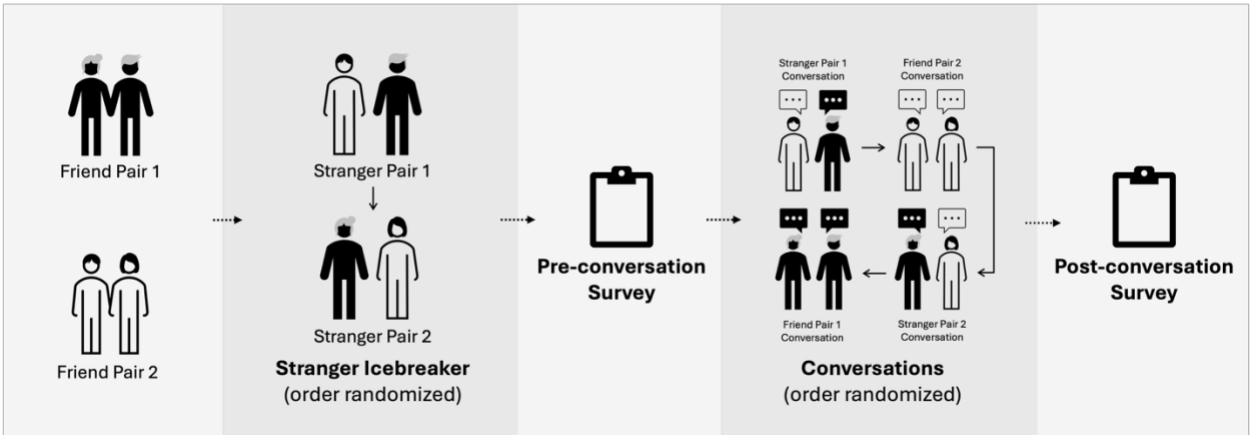

Figure 1. Study procedure overview. Pairs of friends arrived at the lab and were randomly assigned to a stranger partner from the other pair. The stranger dyads had brief icebreaker conversations, then all participants completed the pre-conversation survey. Four interactions, one for each friend pair and one for each stranger pair (in a randomized order), were then recorded in the video booths. During those conversations, each pair discussed what they did that weekend, the ways in which they thought they were similar to each other, and the ways in which they thought they were different from each other. All participants then completed the post-conversation survey.

All conversations were recorded in two video conference booths with a closed-circuit system in adjacent rooms. Each participant was seated on a small stool in a separate and sound

isolated 2m × 2m booth with a life-sized video image of the other participant back projected on a screen at 1.5 meters in front of the participant (Figure 2). A small (2cm x 2cm) video camera was suspended directly in front of the projection screen so that the image of the other participant's forehead was directly behind the camera. In this way, when each participant looks at the eyes of their conversation partner in the projected video image, it seems like they are making eye contact (as opposed to people video conferencing on laptops with cameras positioned above the screen, where looking at your partner's eyes creates the impression that you are looking down).

Figure 2. Experimental recording setup. Conversation partners sat in adjacent rooms in well-lit recording booths. Their real-time video images were back-projected onto their partner's screen] and were captured using cameras positioned directly above the projected image of their partner's face. This allowed them to experience mutual eye contact while isolating their audio streams.

Participants heard each other over headphones and the audio was delayed by 28ms in order to accommodate for the fixed 24ms time lag measured in each video capture and projection system as well as the 4ms lag due to the speed of sound over 1.5 m. People cannot perceive audio lags in conversations shorter than 49-77 ms on average, suggesting our lag is unnoticeable and akin to face-to-face interaction (Schmid et al., 2024). Audio was recorded at 48kHz 24bit resolution from a small lavalier microphone hanging above the participant and stored along with each video track, such that all streams of information were recorded simultaneously. Seating, lighting, temperature, background, and distance from recording devices were held constant

across participants. All conversation prompts, including the icebreaker prompts, were pre-recorded and played through the participants' headphones.

Icebreaker with stranger

Participants first had a structured icebreaker conversation with their stranger partner for up to five minutes so strangers could form an initial impression of one another (see Supplementary Materials, SM 1.1, for conversation prompts). The laughter and content of the icebreaker conversations are not included in the present analyses.

Pre-conversation survey

After each of the two stranger pairs had their icebreaker conversations, all participants completed a survey on individual laptops about their impressions of both their stranger partner and their friend. Participants also reported whether they already knew the stranger they spoke with in the lab; one dyad reported knowing one another prior to the study session. Removing this dyad from the data did not alter the results, so we retained them for analyses. Participants also answered items about their friendship, social networks, and trait agreeableness; we do not include these measures in the present analyses (see online materials for the complete survey). The means and standard deviations for all included measures are reported in Table 1.

Survey	Variable	Mean (Friends)	SD (Friends)	Min. (Friends)	Max. (Friends)	Mean (Strangers)	SD (Strangers)	Min. (Strangers)	Max. (Strangers)	PCA Loadings
Pre-conversation	Single-item similarity	69.86	18.71	18	100	27.14	23.37	0	100	0.38
	Single-item closeness	81.86	16.1	13	100	16.02	18.69	0	93	0.37
	Perceived similarity checklist	5.5	2.15	0	9	2.23	1.32	0	6	0.36
	Perceived personality similarity	5.52	1.22	1	7	4.03	0.89	1	6	0.37
	Perceived hobbies similarity	4.98	1.37	1	7	3.95	0.75	1	7	0.3
	Perceived values similarity	5.79	1.2	1	7	4.02	0.6	2	7	0.37
	Perceived behavior similarity	5.46	1.21	2	7	4.4	0.86	1	6	0.33
	Perceived lifestyle similarity	5.25	1.3	2	7	4.03	0.92	1	6	0.33
	Perceived friendship style similarity	0.83	0.29	-0.03	1	-	-	-	-	-
	Actual friendship style similarity	0.2	0.31	-0.09	1	-	-	-	-	-
Post-conversation	Single-item similarity	82.88	14.39	24	100	41.03	25.81	0	100	0.41
	Single-item closeness	87.57	13.19	26	100	36.7	23.43	0	90	0.37
	Perceived personality similarity	5.85	1.17	1	7	4.5	1.13	1	7	0.39
	Perceived hobbies similarity	5.39	1.37	1	7	3.91	1.2	1	7	0.36
	Perceived values similarity	5.92	1.17	2	7	4.44	0.89	1	7	0.36
	Perceived behavior similarity	5.75	1.08	2	7	4.56	1.01	2	7	0.38
	Perceived lifestyle similarity	5.42	1.29	2	7	4.08	1.13	1	6	0.36
	Self-reported shared reality	5.6	0.78	2.88	7	4.09	1.04	1	7	-
	Single-item conversation enjoyment	6.38	0.85	1	7	5.79	0.78	4	7	-

Table 1. Descriptive statistics for pre- and post-conversation ratings of partners, separately for friend and stranger partners. Measures with a PCA (principal component analysis) loading score were included in the baseline or post-conversation perceived similarity principal component variable, which was used to reduce the redundant perceived similarity measures to a single dimension.

Perceived interpersonal similarity. Participants completed several measures of perceived similarity to their friend and stranger partner: global perceptions of similarity, demographics and social identities similarity, and similarity in terms of behavior and values. We aimed to capture more external forms of similarity (e.g., demographics, hobbies) and more internal forms (e.g., values, personality). These measures used different response formats and, combined, capture a composite of how generally similar participants felt to their partners. We did not expect similarity in any single domain (e.g., personality, gender) to matter as much as their combination, as prior work has shown that the more ways in which people perceive themselves to be similar, the more they are attracted to each other (Montoya & Horton, 2013).

***Single-item perceived similarity and closeness*.** Participants reported how "similar" and "close" they felt "right now" to each partner using response sliders (0 = "not close at all", 100 = "extremely close"). Although not a direct measure of similarity, we include feelings of closeness

because perceived similarity is thought to reduce psychological distance (Liviatan et al., 2008). Indeed, responses on the perceived similarity and closeness items were highly correlated (r = .81).

Perceived similarity checklist. Participants checked a box next to any of the following attributes if they believed they shared them with each partner: age, gender, race, nationality, SES, family structure, religious views, political views, and humor. We then computed similarity scores by adding up the number of checked boxes.

Perceived interpersonal similarity dimensions. Participants then completed an adapted version of a perceived interpersonal similarity scale developed by Schug et al. (2009). Participants rated how similar they thought they and each partner were "right now" in terms of personality, hobbies, values, behavior, and lifestyle using a Likert scale (1 = "not similar at all", 7 = "very similar").

Perceived similarity composite variable calculation. Prior work suggests some variance in perceived similarity is due to global evaluations of similarity across trait dimensions (Srivastava et al., 2010), suggesting our perceived similarity measures—some of which are in fact conceptually overlapping—should cohere to some degree. Indeed, the measures of perceived interpersonal similarity were correlated (ranging from r = .41 to r = .81). For our primary analyses, we therefore opted for a dimension reduction approach. We ran a principal components analysis and found that the first principal component explained 62% of the variance. Although the loadings on the first principal component were modest (ranging from .30 to .41, see Table 1), they were in a consistent direction and are not being used to identify latent dimensions, but to derive a composite score (Jolliffe & Cadima, 2016). We extracted the first component scores for each participant's ratings for each of their partners and multiplied them by -1 so that higher

values indicate greater perceived similarity. This component's scores serve as our pre-conversation perceived similarity variable. For model outputs from analyses with each similarity measure as an independent predictor of laughter, see Supplementary Materials.

Perceived and actual friendship style similarity. Participants completed another measure of interpersonal similarity for their friend but not their stranger partner. This measure was intended to capture a more domain-specific form of similarity: similarity in expectations for that particular friendship. Participants checked boxes next to any of 28 items that described friendship behaviors they expect from their friend, as well as any of the behaviors they thought described what their friend expects from *them.* The 28 friendship behaviors were based on earlier crowd-sourcing from the same undergraduate participant population and included items like "keep the other's secrets," "remember the other's birthday," "spend a lot of time with the other," and "feel like a member of the other's family" (see Supplementary Materials for all 28 items).

For a measure of *perceived* friendship style similarity, we calculated the similarity between the participant's own definition of a friend (28 item checklist) and their belief about their friend's definition of a friend. We used adjusted Rand Index, which estimates the similarity between the two response sets compared to similarity due to chance (Rand, 1971). A score of 1 indicates perfect similarity, 0 indicates similarity equivalent to that due to chance, and -1 indicates perfect disagreement (M = .83, SD = .29, *min* = -.03, *max* = 1). For a measure of *actual* friendship style similarity, for each friendship pair, we calculated the proportion of the friendship behaviors they both expected (or neither expected) of each other (M = .20, SD = .31, *min* = -.09, *max* = 1). Friends thought they were much more similar in their friendship style than they actually were, $t(129)=17.87$, $p < .001$. Perceived and actual friendship style similarity were not significantly correlated, $r = .09$, $p = .29$.

Similarity and difference conversations

After the survey, participants had two separate interactions in the video booths, with both their friend and their stranger partner, for a maximum of seven minutes each. The order of dyads (friends and strangers) was counterbalanced across sessions. Dyads were prompted to answer the following pre-recorded questions, which were delivered to the participants through their headphones.

1. What did you do last weekend? *[Warmup conversation not included in analyses]*
2. In what ways are you similar?
3. In what ways are you different?

The order of the final two questions was randomized across sessions. While answering these questions, dyads brought up a wide range of topics: going to the gym, eye color, race, projecting vs. suppressing their feelings, social circles, type of high school, liking spicy food, and free-thinking. The similarities (M = 96.68 s, SD = 65.94) and differences (M = 100.57 s, SD = 72.48) conversations did not differ significantly in duration, nor did conversations between friends (M = 97.40 s, SD = 65.66) and strangers (M = 99.85, SD = 72.77).

Post-conversation survey

After all interactions were completed, participants completed the post-conversation survey on individual laptops. Besides the following measures, they also reported their current affect, how uncomfortable they felt with each partner, and their prosocial intentions towards each partner (not included in the present analyses, but see online materials for data and survey text). Note that participants gave overall post-interaction ratings of each partner rather than rating them

for the similarity and difference conversations separately. They were then debriefed and completed audio and video release forms.

Perceived interpersonal similarity. Participants completed the same perceived interpersonal similarity measures about both partners as they did before the conversations, except they did not repeat the perceived similarity checklist or the friendship style measures. Once again, we used principal components analysis to create a composite measure of post-conversation perceived similarity, which explained 65% of the variance, and multiplied it by -1 so higher values indicate greater perceived interpersonal similarity. The pre- and post-conversation composite measures were highly correlated, $r = .87$.

Self-reported shared reality. Participants reported how much they felt they shared reality with both their stranger partner and friend using the Interaction-Specific Shared Reality Scale (Rossignac-Milon et al., 2020). The scale includes items such as "During my interaction with [partner name], I felt that we shared the same thoughts and feelings about things" and "During my interaction with [partner name], I felt that we developed a joint perspective" on a 1-7 Likert scale (1 = "strongly disagree" and 7 = "strongly agree").

Single-item conversation enjoyment. Participants reported how much they agreed with the following statement: "I enjoyed my conversation with [partner name]" on a 1-7 Likert scale (1 = "strongly disagree" and 7 = "strongly agree").

Behavior coding for laughter and verbal shared reality

Using Simple Video Coder software (Barto et al., 2017), three independent undergraduate coders, blind to the hypotheses, annotated the time of onset and offset of each participant's laughter and shared reality behaviors (ICC = .89). We calculated (co)laughter duration,

(co)laughter frequency, and shared reality behavior scores separately for each coder and then averaged the coders' scores together. For the time series analyses that require precise behavior onset and offset timestamps, averaging across coders is not possible. We therefore used the most reliable coder's annotations for the time series analyses.

Laughter and colaughter. In accordance with Bryant et al. (2016), we defined laughter as "a nonverbal, egressive, burst series (or single burst), either voiced (periodic) or unvoiced (aperiodic)" (p. 4686), with the additional requirement that the person be visibly smiling. Participants laughed an average of 2.97 times per conversation (*SD*=2.82, *min*=0, *max*=21). The average laughter bout lasted 1.68 seconds (*SD* = 1.31, *min* = 0.1, *max* = 13.0). In 37% of dyads, neither partner ever laughed.

We defined instances of colaughter using Bryant et al.'s (2016) definition, which is that both conversation partners' laughter bouts have an onset within 1 second of each other and overlap in time. By this definition, dyads colaughed an average of 1.34 times per conversation (*SD* = 1.55, min = 0, max = 8.33), 51% of dyads never colaughed, and the average colaugh bout lasting 1.56 seconds (*SD* = 1.29, *min*= 0.1, *max* = 9.6). To ensure that our conclusions are robust to the operationalization of amount of (co)laughter, for all research questions we analyze both number of (co)laugh bouts and total duration of (co)laughter for each conversation. However, we note that the four laughter variables are strongly correlated at the conversation level (Table 2).

	1	2	3
1. Total laughter duration			
2. Number of laughs	0.86		
3. Total colaughter duration	0.85	0.62	
4. Number of colaughs	0.80	0.79	0.84

Table 2. Correlations between laughter and colaughter total durations and counts.

For RQ4 (within-conversation laughter and shared reality behaviors predicting each other), we binned conversations into 2-second windows and coded the presence (1) or absence (0) of laughter for *either* participant.

Shared reality behaviors. As a behavioral indicator of perceived interpersonal similarity, we used an adapted version of Rossignac-Milon et al.'s (2020) behavior coding method for capturing verbal expressions of shared reality. We coded instances of the following verbal expressions that indicate partners believed they were sharing thoughts or feelings:

1. Vocalizing thought similarity (count of behavior per dyad per conversation: M = .18; SD = .38; e.g., "For sure", "Yes, that's what I was going to say)
2. Expressing agreement (M = 4.61; SD = 3.65; e.g., "Totally", "Yeah, that makes sense")
3. Saying things (nearly) at the same time (M = .51; SD = .76)
4. Finishing each other's sentences (M = .63; SD = .80)

Note that coders in the original study by Rossignac-Milon et al. (2020) rated how frequently the dyad did the above behaviors on a Likert scale from 1 ("never") to 7 ("very frequently"). We opted for a more objective approach by coding discrete instances of each behavior. Analyses for RQ4 take a between- and within-conversation approach. For the between-conversation analysis, we standardized the counts of each behavior across participants, since some are more frequent than others, and averaged across all 4 categories for each person for each conversation. For the within-conversation analysis, we binned conversations into 2-second windows and coded the presence (1) or absence (0) of expressions of shared reality behavior by *either* participant. We chose 2 seconds as our window length since the average laughter bout (M = 1.68 s) would fit within it, although some laughter bouts did cross bin boundaries and were coded as present in both of them.

Analysis Plan

The central question is how perceived interpersonal similarity relates to laughter and colaughter. We address this question in five stages based on our five research questions (RQs). First, we ask whether instructing friend and stranger dyads to explicitly discuss their similarities and differences—which was intended to temporarily increase or decrease feelings of similarity—changes the frequency and duration of their laughter (RQ1). Second, we ask whether a participant's laughter is predicted by their own perceptions of similarity or their partner's perceptions of similarity, or whether they moderate each other (RQ2). Third, we ask whether the frequency and duration of laughter predict post-conversation feelings of similarity and self-reported shared reality (RQ3). We also use laughter to predict enjoyment of interactions to test the enjoyment explanation for conversational laughter. Fourth, we look at the association between laughter and verbal expressions of shared reality (RQ4). We did this first by regressing aggregated shared reality behavior scores onto laughter (between-conversation analysis). We then use a lagged time series approach to see whether verbal shared reality behaviors were more or less likely if they were preceded by laughter, and whether laughter was more or less likely if it was preceded by verbal shared reality behaviors. Fifth, we focus on the friend dyads and ask whether perceived or actual similarity in friendship styles best predicts laughter (RQ5).

The decision to quantify laughter in terms of laughter bouts versus total laughter duration was arbitrary and represented researcher degrees of freedom. We therefore decided to analyze both frequency and duration of laughter and colaughter as a robustness check and, in the Discussion, we emphasize the findings that were significant for both.

We used mixed-effects models to handle the non-independence of our data. To account for number of (co)laughs being a zero-inflated count variable, we fit negative binomial mixed-

effects models with the function glmer.nb() from the lme4 R library (Bates et al., 2015). We report incidence rate ratios (IRR) for these models, which can be interpreted as the factor by which the outcome variable changes with a unit increase in a predictor (e.g., a hypothetical IRR=1.5 for number of laughs as a function of conversation type would mean the similarities conversations had 50% more laughs than the differences conversations). The laughter and colaughter duration variables are continuous but zero-inflated with a positive skew. For those variables, we used a Tweedie distribution and the glmmTMB() function from the glmmTMB R package (Brooks et al., 2017). For the time series analysis (RQ4), where the outcome variables are binary, we used logistic mixed-effects models (glmer() function from lme4) and report model estimates as odds ratios (ORs). For all other variables, we used the lmer() function to fit linear mixed-effects models and report unstandardized model coefficients. When the outcome variable was a repeated variable at the participant level (e.g., laughter), we included random intercepts for participant and partner. When the outcome variable was a repeated measure at the dyad level (e.g., colaughter), we included random intercepts for dyads nested within session groups. For the subset analysis of just the friend dyads, we included random intercepts for participants nested within session groups. In all models, we control for conversation duration (in seconds divided by 10 to aid model convergence).

In the results below, we only report statistically significant results related to laughter, but see complete model estimates in Supplementary Materials. We include visualizations for key significant interaction effects to aid with interpretation. All code and data necessary to replicate the analyses are available online (along with additional analyses of the effect of gender on laughter, https://osf.io/u67gy/?view_only=3f9d9ccf10b9462e9c9077663da67112).

Results

Predicting laughter from friendship status and conversation type (RQ1)

In a series of mixed-effects models, we regressed number of laughs, total laugh duration, number of colaughs, and total colaughter duration on friendship status (-.5 = strangers, .5 = friends), conversation type (-.5 = differences, .5 = similarities), the interaction between friendship status and conversation type, and conversation duration as a covariate. Compared to strangers, friends laughed more frequently (*IRR* = 1.27, 95% *CI* = 1.15-1.41, $p < .001$) and for longer ($b = 1.77$, 95% *CI* = 1.59-1.98, $p < .001$) and had more frequent colaughter (*IRR* = 1.64, 95% *CI* = 1.24-2.17, $p < .001$), and a longer duration of colaughter ($b = 2.52$, 95% *CI* = 1.72-3.70, $p < .001$). There was a significant interaction between friendship status and conversation type for laughter duration ($b = 0.78$, 95% *CI* = 0.63-0.97, $p = .028$). The difference in amount of laughter between friends and strangers was greater for the differences conversations compared to the similarities conversations (Figure 3).

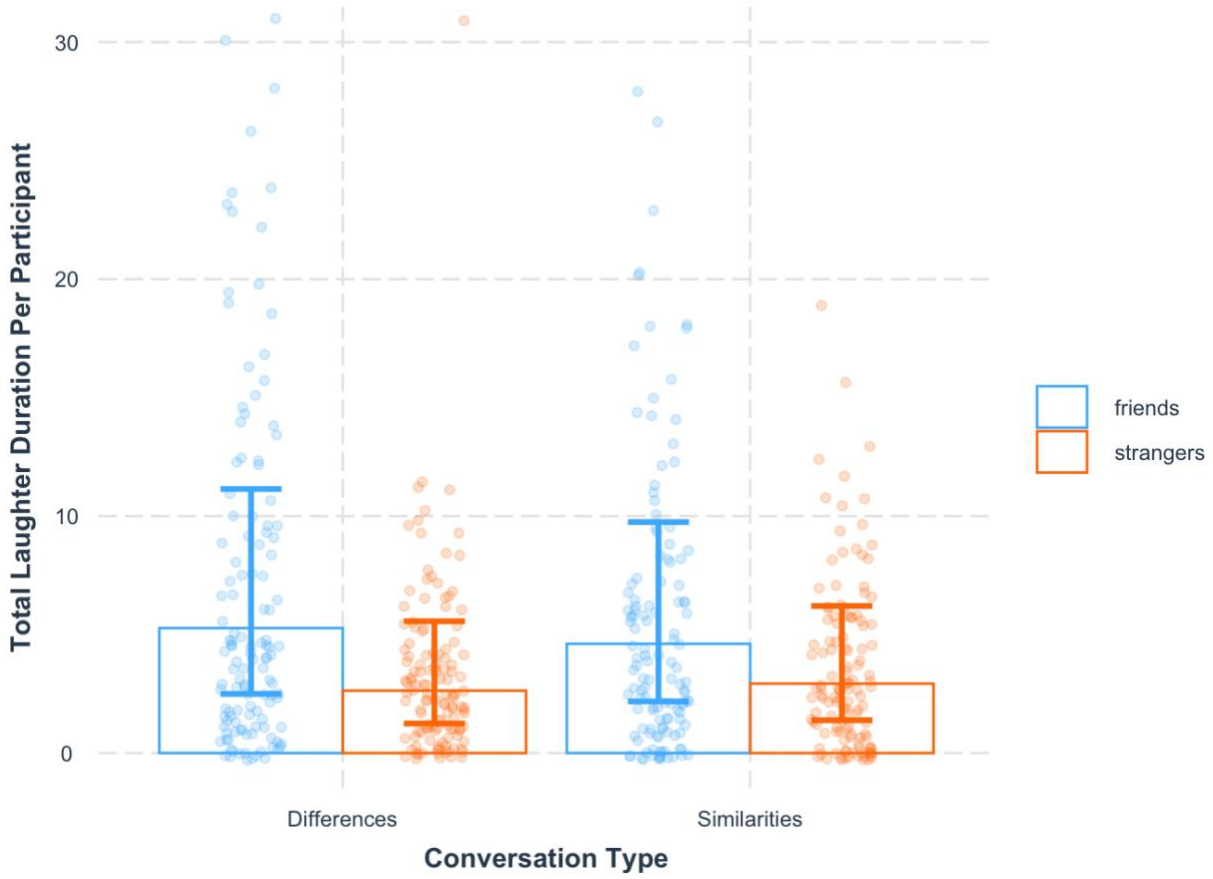

Figure 3. The interaction between conversation type and friendship status was significant for total laughter duration. Friends laughed more than strangers overall, but especially so in the differences conversations.

Predicting laughter from perceived interpersonal similarity at baseline (RQ2)

Next we asked whether people laugh more when they feel similar to their partner, or whether their *partner's* feelings of similarity are enough to elicit their laughter. We regressed participants' laughter frequency and duration on their own baseline composite perceptions of similarity, their partner's baseline composite perceptions of similarity, the interaction between the two, and conversation duration. Since friendship status is so highly correlated with perceived similarity (r = .79), we did not include it as a covariate. Baseline participant perceived similarity predicted total laughter duration, b = 1.09, 95% CI = 1.01-1.18, p = .025 but not number of laughs.

Participant and partner perceptions of similarity interacted to predict both laughter frequency (*IRR* = 0.98, 95% *CI* = 0.96-1.00, p = .030) and duration (b = 0.97, *95% CI* = 0.95-1.00, p = .038). If either the partner or the participant was lower on perceptions of similarity at baseline, the other person's perceptions mattered more (Figure 4). For instance, the participant's perceptions of similarity significantly predicted their laughter when their partner was a standard deviation below the mean on perceived similarity (the dashed light blue lines in Figure 4); participant's perceptions of similarity no longer predicted their laughter when their partner's perceptions of similarity was average or a standard deviation above the mean. Put differently, a participant's laughter reflects either their own perception of similarity, their partner's, or both. Just one person in the dyad perceiving high levels of similarity is sufficient for higher amounts of laughter to occur, regardless of whether they were friends or strangers.

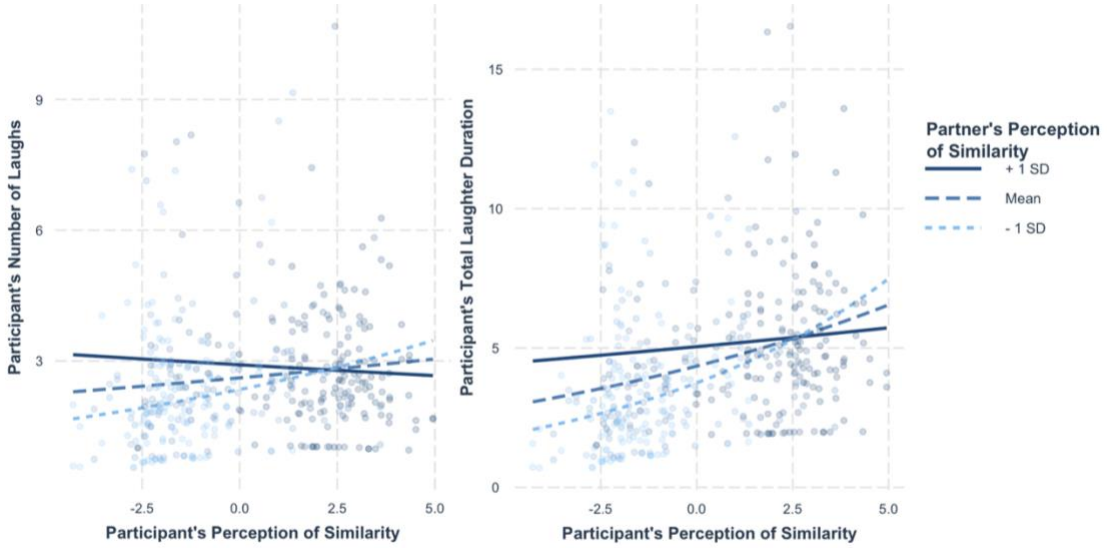

Figure 4. Participant and partner baseline composite perceptions of similarity interacted to predict how much a participant laughed (number of laughs, left plot; total duration of laughter, right plot). Each person's perceptions mattered more for laughter if the other person had low perceptions of similarity at baseline. For instance, the simple effect of participant's perception of similarity (x-axis) is only significant if their partner perceived lower than average similarity to them (dotted light blue line). The composite perceived similarity variables were created using principal components analysis. Points represent partial residuals.

Since colaughter is a dyad-level variable, we could not predict it from the individual perceived similarity scores. We thus regressed frequency and total duration of colaughter on the average of each dyad's baseline perceived similarity. The higher a dyad's average baseline perceptions of similarity, the more colaughter bouts they produced (*IRR* = 1.14, 95% *CI* = 1.06-1.21, $p < .001$) and the longer they colaughed in total ($b = 1.25$, 95% *CI* = 1.14-1.37, $p < .001$; Figure 5).

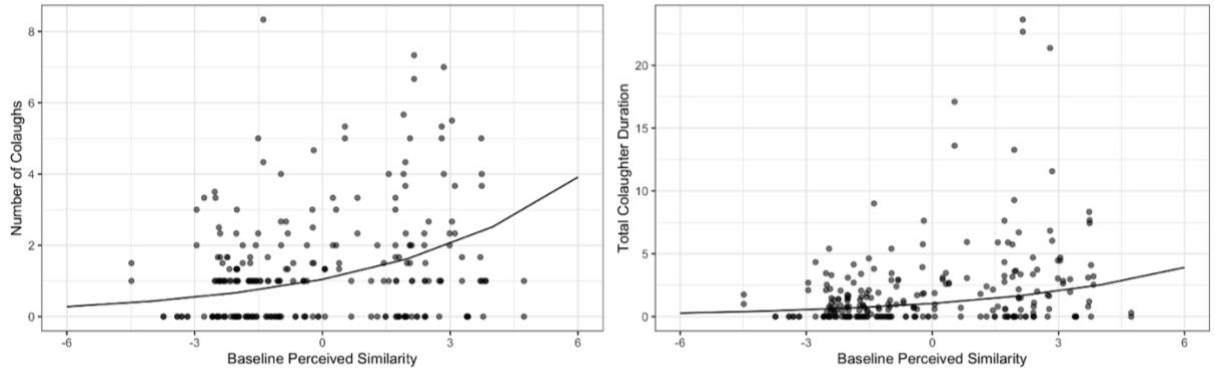

Figure 5. Dyads who perceived themselves to be more similar before their conversations colaughed more (number of colaugh bouts, left; total duration of colaughter, right).

Although the central tests of the association between perceived similarity and laughter rely on the first principal component of the perceived similarity measures, in supplementary analyses (see Supplementary Materials) we report results of regressions predicting the four laughter measures from the following baseline self-report measures: global perceived similarity (single item); global perceived closeness (single item); perceived similarity checklist; and perceived similarity in terms of personality, hobbies, values, behavior, and lifestyle (each measured with a single item). Controlling for all other similarity measures, the global similarity item and personality similarity positively predicted more (co)laughter across all four laughter measures. The global closeness item positively predicted more (co)laughter across all measures except number of laughs. Finally, perceived lifestyle similarity positively predicted laughter

duration. No other individual similarity baseline measures predicted laughter when controlling for the other similarity measures.

Predicting post-conversation perceived similarity and shared reality from laughter (RQ3)

The next models used the following outcome variables: post-conversation composite perceived similarity, self-reported conversation enjoyment, and self-reported shared reality. We ran separate models with these outcome variables for each of the four laughter variables (number of laughs, total duration of laughs, number of colaughs, total duration of colaughs). Each model had the following predictor terms: the laughter variable for the participant and the laughter variable for their partner (except for colaughter, which is at the dyad level), the interactions between participant and partner laughter and friendship status, participant's baseline composite perceived similarity, and conversation duration.

Laughter did not predict post-conversation similarity, regardless of whether we used the first principal component of the post-conversation perceived similarity measures (see Supplementary Materials) or the individual post-conversation similarity measures that predicted laughter from baseline (global similarity, global closeness, and personality similarity; see Online Materials).

Self-reported shared reality, however, was predicted by the duration of colaughter, b = 0.07, *95% CI* = 0.001 – 0.132, p = .047, with a significant interaction with friendship status, b = -0.13, *95% CI* = -0.25- -.01, p = .037 (note these effects are just below threshold and thus unstable; see Figure 5). Stranger dyads that colaughed for longer reported greater perceived shared reality, but there was no association for friends.

Enjoyment was predicted by number of laughs $b = 0.06$, *95% CI* = 0.003 – 0.120, $p = .040$ and laughter duration, $b = 0.04$, *95% CI* = 0.005 – 0.073, $p = .024$. Friendship status interacted with both participant and partner laughter duration to predict enjoyment, but in opposite directions. Participants enjoyed conversations with strangers more the more *they* laughed, $b = -0.07$, *95% CI* = -0.132 – -0.004, $p = 0.037$, but enjoyed conversations with strangers less the more *their partner* laughed (controlling for their own laughter), $b = 0.06$, *95% CI* = 0.001 – 0.128, $p = .047$ (see Supplementary Materials Figure S1 and note these effects are just below threshold and thus unstable). Laughter did not predict how much participants reported enjoying conversations with their friends.

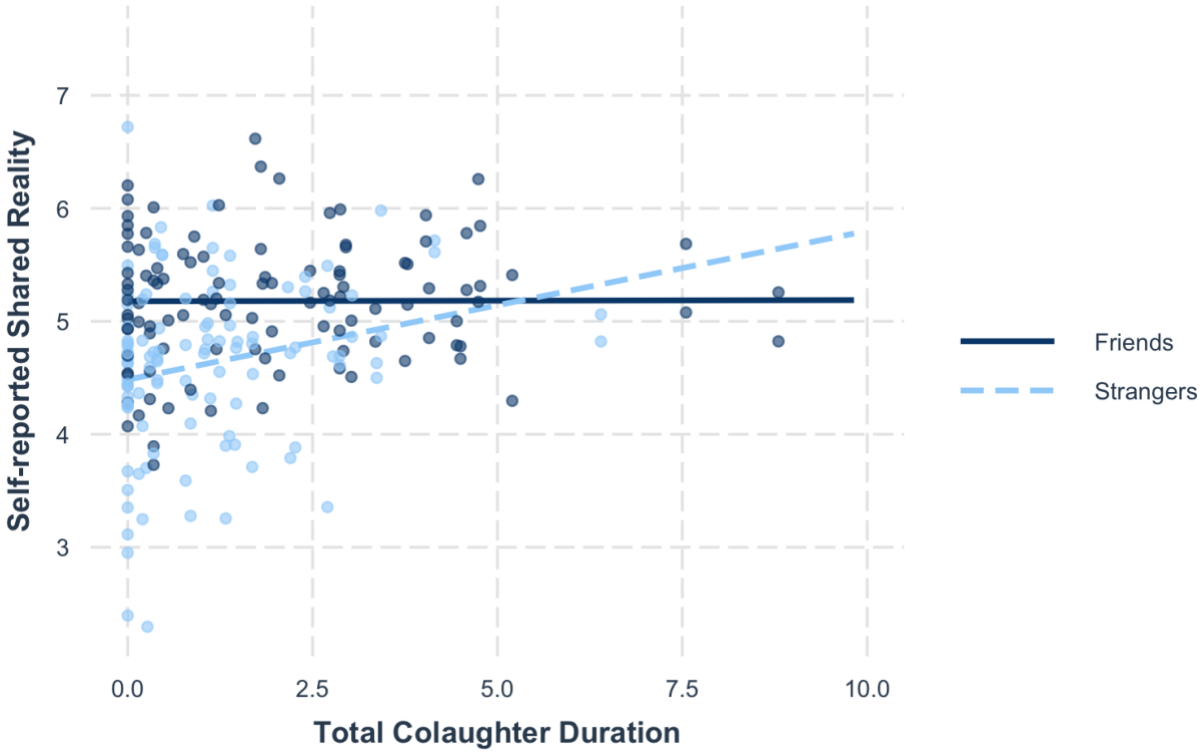

Figure 6. Total colaughter duration predicted self-reported shared reality for strangers but not for friends.

Predicting shared reality behaviors from laughter (RQ4)

First, we looked at between-conversation associations between laughter and verbal expressions of shared reality. We used the same modeling approach as for RQ3 except this time the outcome variable was aggregated verbal expressions of shared reality (one score per person per conversation). More frequent participant (b = 0.17, 95% CI = 0.03-0.32, p = .021) and partner laughter (b = 0.18, 95% CI = 0.04-0.32, p = .015), and more frequent colaughs (b = 0.59, *95% CI* = 0.38-0.80, $p < .001$) and longer total colaughter duration (b = 0.26, *95% CI* = 0.10-0.42, p = .001) all predicted more shared reality behaviors across friends and strangers.

Next, we ask how laughter and expressions of shared reality might be temporally related within conversation. Using time series data with 2-second bins, we regressed a binary variable representing presence/absence of a shared reality behavior on a binary variable representing the presence/absence of laughter in the prior 2-second window (lagged laughter), centered conversation type and friendship status variables, and their interaction with lagged laughter. Across conversation type and both friends and strangers, shared reality behaviors were *less likely* to occur following an instance of laughter, OR = .79, p = .015. Lagged laughter also interacted with friendship status: the absence of laughter predicted a greater likelihood of a shared reality behavior specifically for friends, but not strangers, OR = .66, p = .004 (Figure 7). The reverse temporal sequence was not supported by the data: shared reality behaviors did not predict the presence of laughter in the next 2-second window.

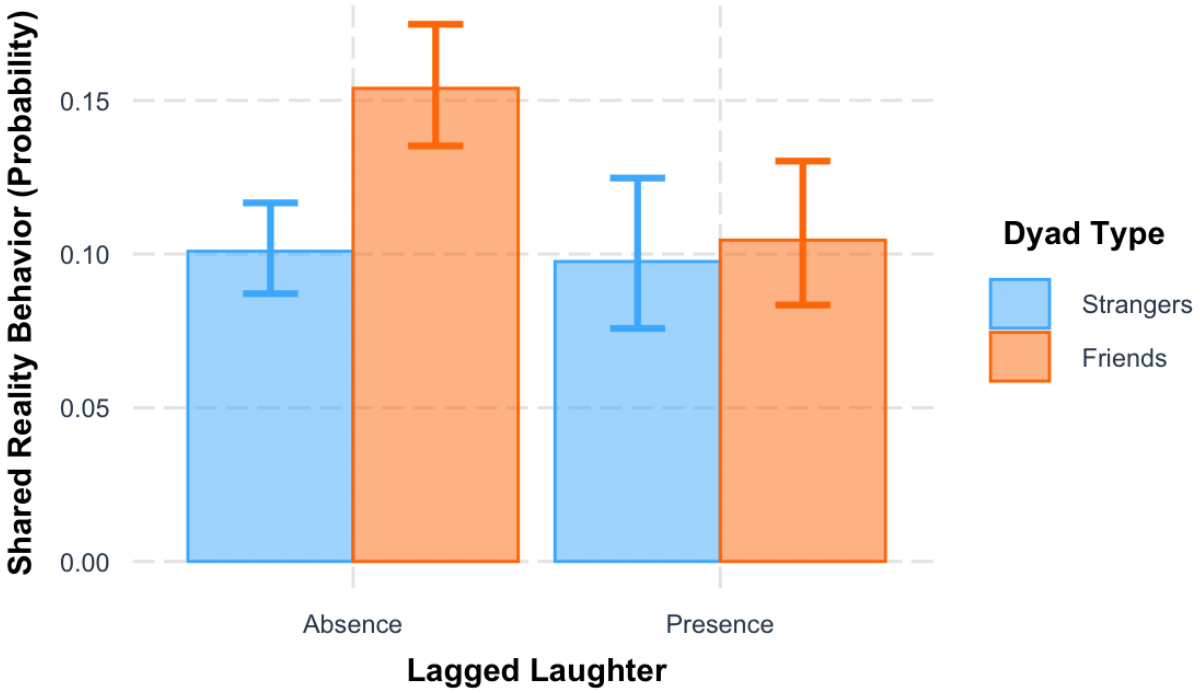

Figure 7. Coders annotated the onset and offset of each instance of laughter and shared reality behavior. We converted the annotations to a time series of 2-second windows. We then used the presence/absence of laughter in the prior window to predict the presence/absence of shared reality behavior in the current window. Shared reality behaviors were more likely if the dyad had not laughed in the prior 2 seconds. This effect was driven by the friend dyads.

Predicting friends' laughter from their perceived and actual friendship style similarity (RQ5)

Finally, we then regressed the laughter variables on perceived and actual friendship style similarity (measured before the conversations) and conversation duration for the friends' conversations only. Participants who perceived themselves and their friend to have more similar friendship expectations laughed more frequently, *IRR* = 1.53, *95% CI* = 1.06-2.23, $p = .025$ and also laughed for a longer amount of time, $b = 1.74$, 95% CI = 1.17-2.60, $p = .007$. Friends who perceived themselves to be more similar also colaughed more frequently, *IRR* = 3.09, *95% CI* = 1.29-7.44, $p = .012$, and colaughed for longer, $b = 4.41$, *95% CI* = 1.29-15.09, $p = .018$. When accounting for perceived similarity, actual friendship style similarity did not predict any of the laughter variables among friend pairs.

Discussion

We examined conversational laughter's relationship to perceived interpersonal similarity, which was quantified using a composite of perceived similarity that included demographics, values, behaviors, and attitudes. Laughter reflected baseline perceptions of interpersonal similarity but was not associated with subsequent changes in perceived similarity. Laughter seemed to function similarly to expressions of shared reality, such that one behavior can substitute for another. The relationship between laughter and similarity sometimes varied across friend and stranger dyads, suggesting laughter functions differently when partners have well-established perceived similarity, intimacy, and history.

Replicating prior work (e.g., Smoski & Bachorowski, 2003), friends laughed and colaughed more than strangers. Regarding RQ1, friends laughed for longer than strangers particularly when discussing their differences (note the interaction between friendship status and conversation type was not significant for colaughter). While this interaction effect was not robust to laughter measure—it was not significant for frequency of laughter bouts—we cautiously speculate about possible explanations that future work could explore. First, laughter is sometimes a response to humor, and humor is the result of an appraisal of benign violation (Warren et al., 2021). The differences discussions may have been surprising (i.e., a violation of expectations) and somewhat taboo (i.e., a violation of friendship norms). However, if the friends had a well-established sense of trust and intimacy, such a violation could be appraised as benign and thus, humorous and laughter-inducing. The second possible explanation is that emphasizing their differences may have temporarily made them feel less similar to each other. Dyads, especially friends, may have been motivated to repair this disruption to their connection by signaling affiliation and rapport through laughter (Gottman et al., 2015).

Participants who perceived themselves to be similar to their partners before their conversations laughed and colaughed more (RQ2). This analysis is unavoidably somewhat redundant with RQ1, as friends perceived themselves to be more similar than strangers: friendship status was strongly correlated with perceived similarity (r = .79) and 84% of friends were above average on baseline perceived similarity (versus 16% of strangers). But by using perceived similarity rather than the binary friendship variable as a predictor, we could tease apart the interacting contributions of a participant's perceptions of similarity and their partner's for participant laughter. Only one partner needed to perceive higher similarity for both partners to laugh more. In other words, a person who perceives themselves to be similar to their partner will laugh more *and* get their partner to laugh more.

The primary analyses used a composite measure of perceived similarity that included identity, behavior, internal attributes, and the global impression of "being similar." This is because we did not expect perceived similarity on a single dimension to be necessary or sufficient to increase laughter. However, we ran secondary analyses simultaneously predicting laughter from all the separate baseline measures of perceived similarity. Controlling for all other perceived similarity measures, global judgments of "similarity" and "closeness," as well as perceived personality similarity, robustly predicted (co)laughter. The association between global perceptions of similarity and laughter validates our decision to use a composite perceived similarity indicator. The fact that perceived global and personality similarity predicted laughter even when controlling for perceived closeness suggests laughter is more than a marker of interpersonal "liking"—it arises, in part, from perceived alignment with another person. This is also supported by the weak association between laughter and enjoyment of the conversations (see also Wood et al., 2022).

While laughter correlates with baseline perceived similarity, we did not find evidence that laughter was associated with further increases in perceived similarity (RQ3). The conversations in the present work were brief; perhaps repeated or longer laughter-filled interactions would predict increases in perceived similarity. We also may have lacked the statistical power to detect subtle effects of laughter on perceived similarity.

It is also possible that only some forms of laughter help people feel more similar. Conversation analysis to distinguish the type of speech acts laughter is a response to, or modifier of, could test whether the different conversational functions of laughter have different associations with perceived similarity (Glenn, 2010; Wang et al., 2016). Another way to subtype laughter is using acoustic analysis, which provides information about its social function (Wood, 2020; Wood et al., 2017). We hypothesize that more reward (i.e., enjoyment) colaughter might be uniquely associated with perceived similarity because it reflects a shared sense of humor and play.

These findings build on prior work (Wood et al., 2022) that also showed an association between perceptions of similarity and laughter. All conversations in Wood et al. (2022) were between strangers, whereas the present work also included friend dyads. We show that perceived similarity predicts laughter even in a sample with greater variance in perceived similarity (since friends are much higher in perceived similarity than strangers). Further, Wood et al. (2022) only measured perceived similarity once, post-conversation. Those perceived similarity scores were likely a combination of first impressions (i.e., baseline perceived similarity) and similarities discovered through conversation. That study therefore could not distinguish between baseline perceived similarity predicting laughter and laughter predicting post-conversation similarity. Wood et al. (2022) also did not examine whether self and partner perceived similarity interacted

to predict laughter, whereas the present work found that either a participant *or* their partner feeling similar predicted more participant laughter.

Conversations with more laughter and colaughter had more verbal expressions of shared reality, such as statements like "I agree" and partners finishing each other's sentences (RQ4). Strangers who colaughed for longer reported experiencing shared reality (controlling for baseline perceived similarity), but the association was not robust across the other (co)laughter variables. Why might laughter be associated with behavioral indicators of shared reality more robustly than self-reported shared reality? We speculate that laughter and shared reality behaviors function as communicative signals of affiliation and shared understanding that are sometimes divorced from private feelings of affiliation and shared understanding (Lavan et al., 2016). Perhaps laughter and verbal expressions of shared reality help coordinate conversation and signal moments of alignment, but momentary alignment does not guarantee an appraisal of global similarity with a partner.

Complicating matters and reflecting a sort of Simpson's paradox (Kievit et al., 2013), time series analysis revealed that people were *less* likely to express shared reality in the two seconds after either partner laughed, particularly if they were friends. Thus conversations with more laughter have more verbal expressions of shared reality, but moments with laughter were less likely to be followed by verbal expressions of shared reality. We speculate that laughter and verbal expressions of shared reality serve similar conversational functions—at least in the current conversational context—and producing both would be redundant. The negative moment-to-moment association was present for friends but not strangers. When friends produce either signal, they may need less signal redundancy since their established relationship allows for more efficient communication (Templeton et al., 2024; cf., Pollmann & Krahmer, 2018). Although

other research has linked expressions of shared reality to other verbal behaviors during conversation (Rossignac-Milon et al., 2024), the present study is the first to link shared reality expressions to nonverbal behavior or to consider different relationship types.

Among friends, perceived similarity (in friendship styles), not actual similarity, predicted laughter (RQ5). Substantial research on network homophily suggests that people choose friends who are similar to them across attributes, from socioeconomic status (Redhead et al., 2023) to music preferences (M. H. W. Selfhout et al., 2009) to religion (Cheadle & Schwadel, 2012) to extraversion (Feiler & Kleinbaum, 2015). However, research also suggests that believing oneself to be similar to a social partner is more predictive of interpersonal attraction (Cemalcilar et al., 2018; Montoya et al., 2008), friendship intensity (M. Selfhout et al., 2009), and community belonging (Chadha et al., 2024) than *actually* being similar. We did not have an actual similarity measure for strangers, so future work will have to examine whether this effect replicates across relationship type.

Limitations and Future Directions

We suggest that perceived similarity increases laughter, but that laughter does not increase perceived similarity (at least in our highly specific conversational context). However, the present data are correlational, so future work will need to manipulate both perceived similarity and conversational laughter. Furthermore, it is possible that the null effect of laughter on post-conversation perceived similarity comes from a lack of statistical power or is specific to the present, admittedly unusual, laboratory conversation context.

The study design had several other limitations. Conversation partners were in separate booths to isolate their audio streams. The booths were designed to more closely mimic physical in-

person conversation than traditional video conferencing platforms, as cameras were positioned to make participants feel as though they were making eye contact with their partners. Face-to-face interactions increase positive affect and feelings of social connection more than video-mediated interactions (Liang et al., 2024), so perhaps more of our dyads would have laughed and achieved greater feelings of similarity if they had interacted face-to-face.

Future work should rule out potential confounds built into the friends and strangers conditions (e.g., strangers began the session with an icebreaker conversation but friends did not). Future work should also control for how long friends have known each other to separate the subjective feeling of being similar to another person—which can arise quickly based on superficial features—from the knowledge of similarity based on extensive shared history and social influence. Note, however, that other work found an association between shared laughter and perceived similarity even when controlling for friendship duration (Kurtz & Algoe, 2017). Future work should also measure perceived similarity after each conversation (similarities and differences) rather than once at the end to examine whether the conversations temporarily shifted perceptions of similarity. Finally, future work should also see whether the present and related findings (e.g., Wood et al., 2022) generalize to non-college samples. College students from the same university have some inherent baseline similarity and shared identity. Studying other populations is also imperative because cultures vary in the frequency and function of conversational laughter (Bryant & Bainbridge, 2022; Ramírez-Esparza et al., 2019).

The function and meaning of laughter likely varies across conversational contexts (e.g., Wang et al., 2016). We gave participants conversation prompts that led many participants to discuss potentially norm-violating topics: at least among strangers, it is uncommon and perhaps impolite to categorize another person in the service of identifying similarities and differences.

Future work should systematically map the space of conversational goals and uncover when (co)laughter predicts successful outcomes (Kangasharju & Nikko, 2009). Creative group tasks may benefit from the shared playfulness associated with colaughter (Coates, 2007) but laughter may function differently in other conversational contexts, especially ones with focused goals, status asymmetries (Glenn, 2010; Wang et al., 2016), or ones marked by intense stress (Canestrari et al., 2021; Vagnoli et al., 2022).

Finally, future work should explore the extent to which individual differences moderate the present findings. People with gelotophobia, or the fear of being laughed at, view laughter as negative and aversive, no matter the context (Ruch et al., 2014). Gelotophilia (the joy of being laughed at) and katageloasticism (the joy of laughing at others) are other individual differences that may moderate how people use laughter in conversation (Ruch & Proyer, 2009). Romantic couples tend to be similar in their levels of gelotophobia, gelotophilia, and katageloasticism, which impacts relationship functioning (Brauer et al., 2021; Brauer & Proyer, 2018). Future work should investigate if these traits moderate the association between perceived similarity and laughter.

In sum, laughter is often seen as a downstream consequence of emotion or humor. The present work reframes laughter not just as a signal of amusement or enjoyment, but as a social barometer of perceived similarity.

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Supplementary Materials:

Laughter indicates perceived similarity among friends and strangers

Note: Section 1 provides additional methods information and Section 2 provides the complete output for all models reported in the main manuscript.

Table of content for Supplementary Materials

1. Methods

1.1 Icebreaker prompts

Stranger dyads first had an icebreaker conversation using the following prompts, adapted from Kardas et al. (2022).

1) What is your name?
2) Where are you from?
3) What is your major or intended major?
4) When was the last time you walked for more than an hour? Describe where you went and what you saw.
5) Do you like to get up early or stay up late? Why?

1.2 Friendship style checklist

Participants indicated whether they expected each of the following behaviors of their friend, as well as whether they thought their friend expected the following behaviors from them.

1. Let the other borrow money if needed
2. Remember the other's birthday
3. Help the other with moving
4. Keep the other's secrets
5. Work through the other's personal problems with them
6. Defend the other when someone mistreats or hurts them
7. Help the other feel better when they are upset
8. Maintain a relationship even after a big fight
9. Empathize with the other's experiences
10. Would never intentionally try to hurt the other
11. Spend a lot of time with the other
12. Can talk about anything with the other
13. Never judge the other
14. Will not talk badly about one behind the other's back
15. Share uncomfortable/ difficult experiences with the other
16. Check in on the other periodically
17. Listen carefully to the other
18. Be able to sit in silence with the other without it feeling awkward
19. Call the other out on their mistakes
20. Be in tune with the other's emotions
21. Feel like a member of the other's family
22. Forgive the other when they make a mistake
23. Sacrifice time for the other

24. Joke around with the other
25. Buy the other things (e.g., gifts, food)
26. Be someone the other can go to for advice during a hard time
27. Send the other memes/funny videos
28. Like the other's photos/posts on social media

2. Results

2.1 Predicting laughter from friendship status and conversation type (RQ1)

	Num. Laughs			**Laughter Duration**			**Num. Colaughs**			**Colaughter Duration**		
Predictors	*Incidence Rate Ratios*	*CI*	*p*	*Estimates*	*CI*	*p*	*Incidence Rate Ratios*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	1.32	1.13 – 1.54	**<0.001**	1.68	1.40 – 2.02	**<0.001**	0.54	0.39 – 0.75	**<0.001**	0.48	0.32 – 0.71	**<0.001**
Strangers v. Friends	1.25	1.13 – 1.38	**<0.001**	1.66	1.47 – 1.86	**<0.001**	1.54	1.14 – 2.08	**0.005**	2.15	1.47 – 3.13	**<0.001**
Differences v. Similarities Conversation	1.01	0.92 – 1.11	0.768	1.02	0.91 – 1.14	0.781	1.05	0.86 – 1.30	0.618	1.04	0.81 – 1.33	0.774
Duration of conversation	1.07	1.06 – 1.08	**<0.001**	1.08	1.07 – 1.09	**<0.001**	1.07	1.04 – 1.09	**<0.001**	1.07	1.05 – 1.10	**<0.001**
Friends*Conversation Type	0.83	0.69 – 1.00	0.050	0.75	0.60 – 0.95	**0.014**	0.91	0.60 – 1.37	0.654	0.82	0.50 – 1.34	0.432
Random Effects												
σ^2	0.24			0.31			0.50			0.56		
τ_{00}	0.06 $_{\text{partnerID}}$			0.33 $_{\text{actorID}}$			0.29 $_{\text{dyadID:groupID}}$			0.52 $_{\text{dyadID:groupID}}$		
	0.22 $_{\text{actorID}}$			0.06 $_{\text{partnerID}}$			0.17 $_{\text{groupID}}$			0.26 $_{\text{groupID}}$		
ICC	0.54			0.56			0.48			0.58		
N	127 $_{\text{actorID}}$			127 $_{\text{actorID}}$			126 $_{\text{dyadID}}$			126 $_{\text{dyadID}}$		
	128 $_{\text{partnerID}}$			128 $_{\text{partnerID}}$			32 $_{\text{groupID}}$			32 $_{\text{groupID}}$		
Observations	508			508			252			252		
Marginal R^2 / Conditional R^2	0.328 / 0.688			0.323 / 0.699			0.207 / 0.592			0.228 / 0.676		

2.2 Predicting laughter from perceived interpersonal similarity at baseline (RQ2)

	Num. Laughs			**Laughter Duration**		
Predictors	*Incidence Rate Ratios CI*		*p*	*Estimates CI*		*p*
(Intercept)	1.25	1.05 – 1.49	**0.011**	1.82	1.47 – 2.26	**<0.001**
Baseline participant perceived similarity	1.04	0.98 – 1.10	0.257	1.09	1.01 – 1.18	**0.025**
Baseline partner perceived similarity	1.05	0.99 – 1.11	0.105	1.07	0.99 – 1.15	0.080
Participant*Partner Similarity	0.98	0.96 – 1.00	**0.030**	0.97	0.95 – 1.00	**0.038**
Duration of conversation	1.07	1.06 – 1.09	**<0.001**	1.07	1.06 – 1.09	**<0.001**
Random Effects						
σ^2	0.28			0.24		
τ_{00}	0.05 $_{partnerID}$			0.14 $_{partnerID}$		
	0.13 $_{actorID}$			0.33 $_{actorID}$		
ICC	0.39			0.66		
N	127 $_{partnerID}$			127 $_{partnerID}$		
	127 $_{actorID}$			127 $_{actorID}$		
Observations	416			416		
Marginal R^2 / Conditional R^2	0.379 / 0.623			0.310 / 0.766		

	Num. Colaughs			**Colaughter Duration**		
Predictors	*Incidence Rate Ratios CI*		*p*	*Estimates CI*		*p*
(Intercept)	0.53	0.39 – 0.72	**<0.001**	0.55	0.37 – 0.80	**0.002**
Baseline perceived similarity (both partners)	1.14	1.06 – 1.21	**<0.001**	1.25	1.14 – 1.37	**<0.001**
Duration of conversation	1.07	1.04 – 1.09	**<0.001**	1.07	1.04 – 1.10	**<0.001**
Random Effects						
σ^2	0.56			0.47		
τ_{00}	0.19 $_{dyadID:groupID}$			0.65 $_{dyadID:groupID}$		
	0.11 $_{groupID}$			0.19 $_{groupID}$		
ICC	0.35			0.64		
N	125 $_{dyadID}$			125 $_{dyadID}$		
	32 $_{groupID}$			32 $_{groupID}$		
Observations	250			250		
Marginal R^2 / Conditional R^2	0.243 / 0.507			0.250 / 0.729		

2.3 Predicting post-conversation self-reported similarity, enjoyment, and shared reality from laughter (RQ3)

2.3.1. Number of laughs as predictors

	Similarity (PC)			**Enjoyment**			**Shared Reality**		
Predictors	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	-0.01	-0.35 – 0.33	0.954	5.88	5.64 – 6.13	**<0.001**	4.69	4.41 – 4.96	**<0.001**
Strangers v. Friends	0.15	-0.27 – 0.58	0.481	0.07	-0.24 – 0.39	0.643	0.52	0.19 – 0.86	**0.002**
Number of Laughs (Participant)	0.02	-0.06 – 0.10	0.689	0.06	0.00 – 0.12	**0.040**	0.01	-0.06 – 0.07	0.853
Number of Laughs*Friends	-0.02	-0.16 – 0.13	0.817	-0.06	-0.16 – 0.05	0.292	-0.05	-0.17 – 0.06	0.334
Number of Laughs (Partner)	0.02	-0.06 – 0.09	0.668	-0.01	-0.07 – 0.04	0.635	0.04	-0.02 – 0.10	0.218
Number of Laughs (Partner)*Friends	-0.05	-0.19 – 0.10	0.506	0.09	-0.01 – 0.20	0.080	0.01	-0.10 – 0.12	0.857
Duration of conversation	0.01	-0.02 – 0.04	0.640	0.02	-0.00 – 0.04	0.070	0.02	-0.00 – 0.05	0.092
Baseline Perceived Similarity	0.78	0.68 – 0.88	**<0.001**	0.13	0.06 – 0.20	**0.001**	0.26	0.18 – 0.33	**<0.001**
Random Effects									
σ^2	0.84			0.48			0.53		
τ_{00}	$0.21_{actorID}$			$0.10_{actorID}$			$0.17_{actorID}$		
	$0.04_{partnerID}$			$0.00_{partnerID}$			$0.00_{partnerID}$		
ICC	0.22								
N	$125_{partnerID}$			$127_{actorID}$			$127_{actorID}$		
	$126_{actorID}$			$127_{partnerID}$			$127_{partnerID}$		
Observations	221			227			225		
Marginal R^2 / Conditional R^2	0.752 / 0.808			0.277 / NA			0.571 / NA		

2.3.2 Duration of laughter as predictors

	Similarity (PC)		**Enjoyment**		**Shared Reality**	
Predictors	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*

(Intercept)	0.04	-0.28 – 0.37	0.796	5.85	5.61 – 6.08	**<0.001**	4.68	4.42 – 4.94	**<0.001**
Strangers v. Friends	0.08	-0.35 – 0.52	0.705	0.05	-0.27 – 0.37	0.750	0.46	0.12 – 0.80	**0.009**
Laughter Duration (Participant)	0.03	-0.02 – 0.07	0.286	0.04	0.01 – 0.07	**0.024**	-0.01	-0.04 – 0.03	0.782
Laughter Duration*Friends	-0.06	-0.15 – 0.02	0.145	-0.07	-0.13 – -0.00	**0.037**	-0.04	-0.11 – 0.03	0.271
Laughter Duration (Partner)	0.01	-0.04 – 0.05	0.733	-0.02	-0.05 – 0.01	0.222	0.03	-0.00 – 0.06	0.089
Laughter Duration (Partner)*Friends	0.00	-0.08 – 0.09	0.935	0.06	0.00 – 0.13	**0.047**	-0.00	-0.07 – 0.07	0.917
Duration of conversation	0.01	-0.02 – 0.03	0.714	0.03	0.01 – 0.05	**0.013**	0.02	0.00 – 0.05	**0.030**
Baseline Perceived Similarity	0.78	0.68 – 0.88	**<0.001**	0.13	0.06 – 0.20	**<0.001**	0.26	0.18 – 0.34	**<0.001**
Random Effects									
σ^2	0.84			0.49			0.54		
τ_{00}	0.21_{actorID}			$0.00_{\text{partnerID}}$			$0.00_{\text{partnerID}}$		
	$0.02_{\text{partnerID}}$			0.09_{actorID}			0.15_{actorID}		
ICC	0.22								
N	$125_{\text{partnerID}}$			$127_{\text{partnerID}}$			$127_{\text{partnerID}}$		
	126_{actorID}			127_{actorID}			127_{actorID}		
Observations	221			227			225		
Marginal R^2 / Conditional R^2	0.754 / 0.808			0.276 / NA			0.569 / NA		

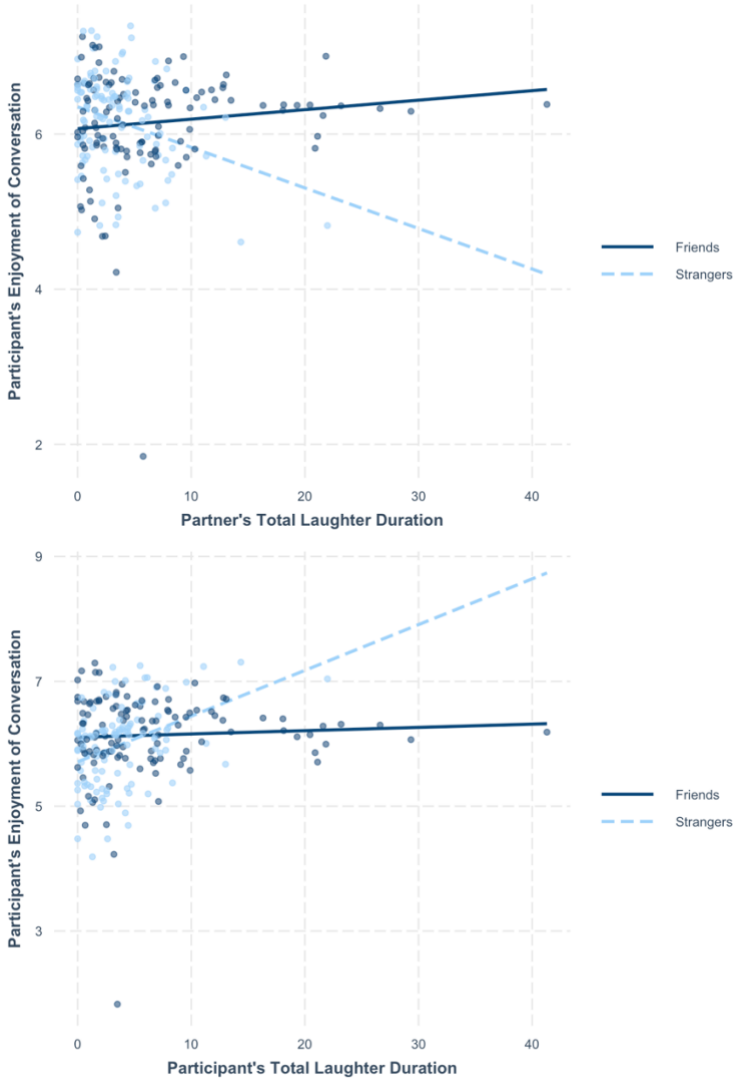

Figure S1. The more a stranger laughed, the less their partner reported enjoying the conversation (above) but the more they reported enjoying the conversation (below; controlling for partner laughter).

2.3.3 Number of colaughs as predictor

	Similarity (PC)			**Enjoyment**			**Shared Reality**		
Predictors	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	-0.07	-0.36 – 0.22	0.649	5.82	5.60 – 6.03	**<0.001**	4.65	4.42 – 4.88	**<0.001**
Strangers v. Friends	0.14	-0.28 – 0.56	0.513	0.09	-0.23 – 0.40	0.587	0.51	0.18 – 0.85	**0.003**
Number of Colaughs	0.02	-0.10 – 0.14	0.771	0.04	-0.05 – 0.12	0.413	0.07	-0.03 – 0.16	0.166
Number of Colaughs*Friends	-0.10	-0.29 – 0.10	0.342	0.03	-0.12 – 0.18	0.673	-0.13	-0.28 – 0.03	0.107
Duration of conversation	0.01	-0.01 – 0.04	0.265	0.03	0.01 – 0.05	**0.002**	0.03	0.01 – 0.05	**0.008**
Baseline Perceived Similarity	0.79	0.69 – 0.89	**<0.001**	0.13	0.05 – 0.20	**0.001**	0.25	0.18 – 0.33	**<0.001**

Random Effects			
σ^2	0.84	0.51	0.53
τ_{00}	0.19 $_{actorID}$	0.00 $_{partnerID}$	0.00 $_{partnerID}$
	0.03 $_{partnerID}$	0.09 $_{actorID}$	0.16 $_{actorID}$
ICC	0.21		
N	126 $_{partnerID}$	128 $_{partnerID}$	128 $_{partnerID}$
	127 $_{actorID}$	127 $_{actorID}$	127 $_{actorID}$
Observations	223	229	227
Marginal R^2 / Conditional R^2	0.752 / 0.805	0.244 / NA	0.570 / NA

2.3.4 Duration of colaughter as predictor

	Similarity (PC)			**Enjoyment**			**Shared Reality**		
Predictors	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.01	-0.28 – 0.30	0.961	5.83	5.62 – 6.05	**<0.001**	4.69	4.46 – 4.92	**<0.001**
Strangers v. Friends	0.06	-0.38 – 0.49	0.803	0.04	-0.29 – 0.37	0.797	0.43	0.09 – 0.78	**0.014**
Duration of Colaughter	0.06	-0.02 – 0.14	0.148	0.04	-0.03 – 0.10	0.260	0.07	0.00 – 0.13	**0.047**
Duration of Colaughter*Friends	-0.12	-0.28 – 0.03	0.124	-0.05	-0.16 – 0.07	0.431	-0.13	-0.25 – -0.01	**0.037**
Duration of conversation	0.01	-0.01 – 0.03	0.370	0.03	0.01 – 0.05	**0.001**	0.03	0.01 – 0.05	**0.004**
Baseline Perceived Similarity	0.78	0.68 – 0.88	**<0.001**	0.13	0.06 – 0.20	**0.001**	0.25	0.18 – 0.33	**<0.001**
Random Effects									
σ^2	0.82			0.51			0.53		
τ_{00}	0.21 $_{actorID}$			0.00 $_{partnerID}$			0.00 $_{partnerID}$		
	0.03 $_{partnerID}$			0.08 $_{actorID}$			0.15 $_{actorID}$		
ICC	0.22								
N	126 $_{partnerID}$			128 $_{partnerID}$			128 $_{partnerID}$		
	127 $_{actorID}$			127 $_{actorID}$			127 $_{actorID}$		
Observations	223			229			227		
Marginal R^2 / Conditional R^2	0.754 / 0.809			0.243 / NA			0.572 / NA		

2.4 Predicting shared reality behaviors from laughter (RQ4)

2.4.1 Number of laughs as predictors

	Shared Reality Behavior		
Predictors	*Estimates*	*CI*	*p*
(Intercept)	-1.65	-2.28 – -1.03	**<0.001**
Strangers v. Friends	0.65	-0.16 – 1.46	0.118

Number of Laughs (Participant)	0.17	0.03 – 0.32	**0.021**
Number of Laughs*Friends	0.04	-0.23 – 0.30	0.788
Number of Laughs (Partner)	0.18	0.04 – 0.32	**0.015**
Number of Laughs (Partner)*Friends	0.23	-0.04 – 0.49	0.090
Duration of conversation	0.17	0.11 – 0.23	**<0.001**
Baseline Perceived Similarity	0.20	0.01 – 0.39	**0.035**
Random Effects			
σ^2	3.06		
$\tau_{00\ actorID}$	0.41		
$\tau_{00\ partnerID}$	0.12		
ICC	0.15		
$N_{\ actorID}$	127		
$N_{\ partnerID}$	127		
Observations	223		
Marginal R^2 / Conditional R^2	0.555 / 0.620		

2.4.2 Duration of laughter as predictors

	Shared Reality Behavior		
Predictors	*Estimates*	*CI*	*p*
(Intercept)	-2.18	-2.80 – -1.56	**<0.001**
Strangers v. Friends	0.57	-0.28 – 1.43	0.188
Laughter Duration (Participant)	0.05	-0.04 – 0.14	0.243
Laughter Duration*Friends	-0.03	-0.20 – 0.14	0.725
Laughter Duration (Partner)	0.03	-0.05 – 0.12	0.429
Laughter Duration (Partner)*Friends	0.07	-0.09 – 0.24	0.395
Duration of conversation	0.23	0.18 – 0.28	**<0.001**
Baseline Perceived Similarity	0.22	0.03 – 0.41	**0.027**
Random Effects			
σ^2	3.20		
$\tau_{00\ partnerID}$	0.21		
$\tau_{00\ actorID}$	0.50		
ICC	0.18		
$N_{\ partnerID}$	127		
$N_{\ actorID}$	127		
Observations	223		

Marginal R^2 / Conditional R^2	0.517 / 0.604

2.4.3 Number of colaughs as predictor

	Shared Reality Behavior		
Predictors	*Estimates*	*CI*	*p*
(Intercept)	-1.94	-2.45 – -1.43	**<0.001**
Strangers v. Friends	0.63	-0.15 – 1.41	0.112
Number of Colaughs	0.59	0.38 – 0.80	**<0.001**
Number of Colaughs*Friends	0.28	-0.07 – 0.64	0.117
Duration of conversation	0.20	0.16 – 0.25	**<0.001**
Baseline Perceived Similarity	0.17	-0.01 – 0.35	0.065
Random Effects			
σ^2	2.75		
$\tau_{00\ partnerID}$	0.19		
$\tau_{00\ actorID}$	0.47		
ICC	0.19		
$N_{\ partnerID}$	128		
$N_{\ actorID}$	127		
Observations	225		
Marginal R^2 / Conditional R^2	0.573 / 0.656		

2.4.4 Duration of colaughter as predictor

	Shared Reality Behavior		
Predictors	*Estimates*	*CI*	*p*
(Intercept)	-2.15	-2.69 – -1.62	**<0.001**
Strangers v. Friends	0.40	-0.46 – 1.26	0.362
Duration of Colaughter	0.26	0.10 – 0.42	**0.001**
Duration of Colaughter*Friends	-0.23	-0.52 – 0.07	0.137
Duration of conversation	0.24	0.20 – 0.28	**<0.001**
Baseline Perceived Similarity	0.21	0.02 – 0.40	**0.033**

Random Effects	
σ^2	3.37
$\tau_{00\ partnerID}$	0.04
$\tau_{00\ actorID}$	0.37
ICC	0.11
$N_{\ partnerID}$	128
$N_{\ actorID}$	127
Observations	225
Marginal R^2 / Conditional R^2	0.529 / 0.579

2.4.5 Lagged time series analyses

GLMM Predicting Shared Reality Behavior from Lagged Laughter

	sr_behavior		
Predictors	*Estimate*	*CI*	*p-value*
(Intercept)	-1.984 ***	-2.085 – -1.882	**<0.001**
lag laugh	-0.174 **	-0.293 – -0.054	**0.004**
Random Effects			
σ^2	3.29		
$\tau_{00\ dyadID}$	0.25		
ICC	0.07		
$N_{\ dyadID}$	128		
Observations	23938		
Marginal R^2 / Conditional R^2	0.001 / 0.072		

** p<0.05 ** p<0.01 *** p<0.001*

GLMM Predicting Laughter from Lagged Shared Reality Behavior

	laugh		
Predictors	*Estimate*	*CI*	*p-value*
(Intercept)	-2.039 ***	-2.164 – -1.914	**<0.001**
lag sr behavior	0.039	-0.075 – 0.153	0.498
Random Effects			
σ^2	3.29		
$\tau_{00\ dyadID}$	0.42		
ICC	0.11		
$N_{\ dyadID}$	128		
Observations	23938		
Marginal R^2 / Conditional R^2	0.000 / 0.113		

** p<0.05 ** p<0.01 *** p<0.001*

GLMM Predicting Shared Reality Behavior from Lagged Laughter × Dyad Type and Conversation Type

	Shared Reality Behavior (binned, binary)	
Fixed Effects	*Log-Odds*	*p*
(Intercept)	-1.95 ***	**<0.001**
lag laugh	-0.24 *	**0.015**
dyadType	0.48 ***	**<0.001**
convoType [difference]	-0.13 **	**0.007**
lag laugh × dyadType	-0.41 **	**0.004**
lag laugh × convoType [difference]	0.13	0.339
Random Effects		
σ^2	3.29	
$\tau_{00\ dyadID}$	0.23	
ICC	0.06	
N_{dyadID}	107	
Observations	20517	
Marginal R^2 / Conditional R^2	0.016 / 0.080	

** p<0.05 ** p<0.01 *** p<0.001*

2.5 Predicting friends' laughter from their perceived and actual friendship style similarity (RQ5)

	Num. Laughs			**Laughter Duration**			**Num. Colaughs**			**Colaughter Duration**		
Predictors	*Incidence Rate Ratios*	*CI*	*p*	*Estimates*	*CI*	*p*	*Incidence Rate Ratios*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.70	0.47 – 1.04	0.080	0.70	0.42 – 1.17	0.178	0.23	0.10 – 0.51	**<0.001**	0.22	0.07 – 0.68	**0.008**
Actual friendship style similarity	1.06	0.76 – 1.48	0.722	1.03	0.57 – 1.86	0.916	1.16	0.65 – 2.06	0.611	0.81	0.35 – 1.88	0.629
Perceived friendship style similarity	1.53	1.06 – 2.23	**0.025**	1.74	1.17 – 2.60	**0.007**	3.09	1.29 – 7.44	**0.012**	4.41	1.29 – 15.09	**0.018**
Duration of conversation	1.10	1.08 – 1.12	**<0.001**	1.14	1.10 – 1.17	**<0.001**	1.08	1.05 – 1.11	**<0.001**	1.09	1.06 – 1.13	**<0.001**
Random Effects												
σ^2	0.16			0.47			0.50					
τ_{00}	0.00 $_{actorID:dyadID}$			0.07 $_{actorID:dyadID}$			0.18 $_{dyadID}$			0.55 $_{dyadID}$		
	0.03 $_{dyadID}$			0.41 $_{dyadID}$								
ICC				0.72			0.28			0.53		

N	126 $_{actorID}$ 63 $_{dyadID}$	126 $_{actorID}$ 63 $_{dyadID}$	63 $_{dyadID}$	63 $_{dyadID}$
Observations	126	126	126	126
Marginal R^2 / Conditional R^2	NA	0.524 / 0.868	0.345 / 0.526	0.312 / 0.675

2.6 Predicting laughter from separate baseline similarity measures

2.6.1 Laughter variables

	Num. Laughs			**Laughter Duration**		
Predictors	*Incidence Rate Ratios*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.72	0.47 – 1.09	0.123	0.73	0.44 – 1.22	0.234
Closeness	1.00	1.00 – 1.01	0.079	1.01	1.00 – 1.01	**<0.001**
Global Similarity	1.00	0.99 – 1.00	**0.039**	0.99	0.99 – 1.00	**0.004**
Personality Similarity	1.14	1.04 – 1.26	**0.007**	1.15	1.03 – 1.29	**0.011**
Hobbies Similarity	0.97	0.90 – 1.04	0.410	0.97	0.89 – 1.05	0.418
Values Similarity	1.02	0.93 – 1.12	0.688	1.08	0.97 – 1.20	0.167
Behavior Similarity	1.04	0.95 – 1.14	0.415	1.07	0.97 – 1.19	0.186
Lifestyle Similarity	0.94	0.87 – 1.02	0.122	0.88	0.80 – 0.97	**0.008**
Similarity Checklist	1.01	0.96 – 1.07	0.644	1.02	0.96 – 1.08	0.502
Conversation Duration	1.07	1.06 – 1.08	**<0.001**	1.07	1.06 – 1.08	**<0.001**
Random Effects						
σ^2	0.29			0.26		
τ_{00}	0.02 $_{partnerID}$			0.04 $_{partnerID}$		

	0.15 $_{actorID}$	0.36 $_{actorID}$
ICC	0.38	0.61
N	128 $_{partnerID}$	128 $_{partnerID}$
	127 $_{actorID}$	127 $_{actorID}$
Observations	458	458
Marginal R^2 / Conditional R^2	0.379 / 0.616	0.359 / 0.748

2.6.2 Colaughter variables

	Num. Colaughs			**Colaughter Duration**		
Predictors	*Incidence Rate Ratios*	*CI*	*p*	*Estimates*	*CI*	*p*
(Intercept)	0.15	0.06 – 0.40	**<0.001**	0.07	0.02 – 0.24	**<0.001**
Closeness	1.01	1.00 – 1.02	**0.014**	1.02	1.01 – 1.03	**0.001**
Global Similarity	0.98	0.97 – 0.99	**0.001**	0.97	0.95 – 0.98	**<0.001**
Personality Similarity	1.68	1.32 – 2.14	**<0.001**	2.09	1.53 – 2.84	**<0.001**
Hobbies Similarity	0.92	0.77 – 1.11	0.395	0.88	0.70 – 1.11	0.286
Values Similarity	0.82	0.66 – 1.01	0.061	0.93	0.70 – 1.22	0.591
Behavior Similarity	1.18	0.91 – 1.52	0.208	1.18	0.85 – 1.64	0.318
Lifestyle Similarity	0.86	0.70 – 1.05	0.144	0.77	0.59 – 1.01	0.061
Similarity Checklist	1.10	0.98 – 1.23	0.118	1.09	0.94 – 1.26	0.274
Conversation Duration	1.07	1.05 – 1.09	**<0.001**	1.07	1.05 – 1.10	**<0.001**
Random Effects						
σ^2	0.56			0.47		
τ_{00}	0.06 $_{dyadID:groupID}$			0.35 $_{dyadID:groupID}$		

	$0.12_{groupID}$	$0.17_{groupID}$
ICC	0.24	0.53
N	125_{dyadID}	125_{dyadID}
	$32_{groupID}$	$32_{groupID}$
Observations	250	250
Marginal R^2 / Conditional R^2	0.384 / 0.535	0.450 / 0.739