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Perceived, not actual, similarity predicts initial attraction in a live romantic context: Evidence from the speed-dating paradigm

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Abstract

The "similarity-attraction" effect stands as one of the most well-known findings in social psychology. However, some research contends that perceived but not actual similarity influences attraction. The current study is the first to examine the effects of actual and perceived similarity simultaneously during a face-to-face initial romantic encounter. Participants attending a speed-dating event interacted with ~12 members of the opposite sex for 4 min each. Actual and perceived similarity for each pair were calculated from questionnaire responses assessed before the event and after each date. Data revealed that perceived, but not actual, similarity significantly predicted romantic liking in this speed-dating context. Furthermore, perceived similarity was a far weaker predictor of attraction when assessed using specific traits rather than generally.

Over the past 60 years, researchers have examined thoroughly the role that similarity between partners plays in predicting interpersonal attraction. Until recently, the general consensus has been that participants report stronger attraction to objectively similar others (i.e., *actual* similarity) than to those with whom they share fewer traits, beliefs, and/or attitudes. The similarity-attraction effect, commonly dubbed "Byrne's law of attraction" or "Byrne's law of similarity," is a central feature of textbook reviews of attraction and relationship initiation.[1]

Research on the actual similarity-attraction effect has most frequently examined similarity of attitudes, finding that participants are more likely to become attracted to a stranger with whom they share many common attitudes than to one with whom they share few (Byrne, 1961; Byrne, Ervin, & Lamberth, 1970). Scholars have also found that actual similarity of personality traits predicts initial attraction, but the results are not as robust as those for attitude similarity (Klohnen & Luo, 2003). Furthermore, some research has suggested that actual similarity in external qualities (e.g., age, hairstyle) is more predictive of

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1. Researchers have also found that actual similarity predicts satisfaction and stability in existing relationships (e.g., Gaunt, 2006; Luo et al., 2008; Luo & Klohnen, 2005), suggesting that Byrne's law of attraction may extend well beyond initial attraction per se. Although we review prior work on similarity in both initial attraction and established relationship contexts below, the present data specifically examine the association between similarity and attraction in an initial face-to-face encounter.

initial attraction than similarity in psychological qualities (e.g., clever, confident) in initial encounters (Duck & Craig, 1975), perhaps because external qualities are easier to assess.

Researchers have also considered the possible influence of *perceived* similarity on attraction. For example, Murstein and Beck (1972) found that married couples' actual and perceived similarity to each another both predicted marital adjustment. However, many other researchers have argued that perceived similarity predicts attraction more strongly than actual similarity does (Condon & Crano, 1988; Hoyle, 1993) and that the actual similarity-attraction effect is limited to interactions with confederates or impressions of "bogus strangers" in laboratory studies (Sunnafrank, 1992). Sunnafrank argues that the actual attitude similarity-attraction effect weakens and even disappears as interaction time with a partner increases, and several other studies have supported his claim (Levinger, 1972; Sunnafrank, 1985; Sunnafrank & Miller, 1981; Wright & Crawford, 1971). In addition, several studies assessing the relation between similarity and marital satisfaction have found significant perceived similarity effects even in the absence of significant actual similarity effects (Acitelli, Douvan, & Veroff, 1993; Levinger & Breedlove, 1966). Even with such a large body of research devoted to the topic—a PsycInfo search for "similarity" and "attraction" provides 1,048 unique results—the robust, highly replicable similarity-attraction effect somehow remains controversial.

Montoya, Horton, and Kirchner (2008) performed an extensive meta-analysis to determine the average sizes of the actual similarity-attraction effect and the perceived similarity-attraction effect, surveying all relevant attitude and personality similarity-attraction studies conducted to date. They found that the overall effect of actual similarity on attraction was large and significant. However, they also found that the strength of the effect depended on the amount of interaction that participants had with the target (e.g., romantic partner, confederate, bogus stranger). Specifically, the actual similarity-attraction effect significantly decreased as interaction time increased; actual similarity was a strong ($r = .59$) predictor of attraction when no interaction had taken place (e.g., the "bogus stranger" paradigm), a weak to moderate ($r = .21$) predictor in short-interaction studies (i.e., a few hours or less), and a very weak, nonsignificant ($r = .08$) predictor for participants in existing relationships. Although this last correlation suggests that actual similarity has little to no effect on attraction in existing relationships—congruent with many of Sunnafrank's claims—it does not rule out the possibility that actual similarity has an important influence on the formation of relationships. Finally, Montoya and colleagues also found a moderate to large effect size ($r = .39$) overall for perceived similarity on attraction that did not differ with amount of interaction. This result provides support for the link between perceived similarity and attraction and does not suggest that its influence is more or less powerful at a particular relationship stage.

Limitations of previous similarity-attraction research

Although the results of Montoya and colleagues (2008) suggest that both actual and perceived similarity have moderate effects on attraction when initiating relationships, few of the studies included in the meta-analysis specifically examined participants' initial interactions with real potential romantic partners (two exceptions were Byrne et al., 1970; Curran & Lippold, 1975). In fact, some of the studies included in the "short-interaction" category examined the attractiveness of job candidates (Orpen, 1984), platonic acquaintances (Nudd, 1965; Waldron & Applegate, 1998), and close friends (Werner & Parmelee, 1979; Wright & Crawford, 1971). To acquire a fuller understanding of the similarity-attraction effect within emerging romantic relationships, it is necessary to examine both actual and perceived similarity in a study in which participants actually encounter potential romantic partners for the first time. This study is the first to do so.

In addition, only 2 of the 313 studies included in the meta-analysis were from the

year 2000 or later (Michinov & Monteil, 2002; Montoya & Horton, 2004). Although classic studies form the basis for our current understanding of these effects and deserve inclusion in the meta-analytical calculation, many of these studies based their conclusions on outdated methodological and statistical approaches. For example, researchers who studied initial romantic attraction in the past relied heavily on the use of manufactured interactions such as confederate partners who explicitly discussed their questionnaire responses (e. g., Kleck & Reubenstein, 1975) and bogus "partner information sheets" (e.g., Byrne, 1961). However, neither of these methods is analogous to settings in which participants encounter potential partners in everyday life. Very rarely have researchers arranged dates between two naïve participants to study the importance of actual similarity in initial romantic encounters, and even the rare exceptions (e.g., the oft-cited "Coke Date" study; Byrne et al., 1970) differ from natural interactions. For example, in the Coke Date study (Byrne et al., 1970), the researchers told participants (accurately) that they had matched each other on either a high or low percentage of attitudes before their interaction. Relative to natural live interactions, this procedure may have stacked the deck in favor of finding actual similarity effects by (a) making similarity information salient to the participants, thus increasing the possibility that it would influence their interactions (i.e., a demand characteristic), and/or (b) increasing the association between actual and perceived similarity, thus allowing actual similarity to "piggyback" off of perceived similarity.

To reach a better understanding of the similarity-attraction effect, researchers should revisit it using modern tools. Indeed, current methods can provide new insights into the processes that characterize a potential or current relationship. A few of these newer methods include daily diaries (Feeney, 2002; Thompson & Bolger, 1999) and, of particular relevance to the current study, speed-dating (Finkel & Eastwick, 2008; Fisman, Iyengar, Kamenica, & Simonson, 2006; Houser, Horan, & Furler, 2008; Kurzban & Weeden, 2005; Luo & Zhang, 2009; Todd, Penke, Fasolo, & Lenton, 2007).

Speed-dating as a method for studying romantic attraction

In a speed-dating session, participants interact with one another in a sequence of short, one-on-one dates. Speed-dating shares many similarities with other natural settings in which individuals meet and evaluate potential romantic partners, such as bars and parties, and it also offers several advantages for researchers (Eastwick & Finkel, 2008; Finkel, Eastwick, & Matthews, 2007). For example, speed-dating research permits the assessment of data from both partners participating in a brief, unstructured interaction and the subsequent comparison of the two reports. Also, many of the participants' ratings and assessments of the interaction can be captured seconds afterward, thereby minimizing memory biases. Although a 4-min "date" might seem too brief a priori to allow participants to learn much about their potential partners, previous research has shown that speed-daters' evaluations and behaviors reflect subtle and sophisticated interpersonal phenomena (e.g., Eastwick, Finkel, Mochon, & Ariely, 2007; Place, Todd, Penke, & Asendorpf, 2009). Like most experimental designs, speed-dating is not a perfect facsimile of everyday life; for example, speed-daters meet potential partners whom they otherwise might never encounter. Yet speed-dating corrects many shortcomings of previous similarity-attraction designs by allowing participants to interact with live potential romantic partners (not confederates or bogus strangers) and by leaving the discovery of similarity to the participants themselves. Furthermore, for parallelism with prior similarity research, speed-dating permits the inclusion of the same measures used in previous designs (e.g., ratings of attitudes and personality traits for similarity calculations, ratings of liking for the interaction partner). In short, the speed-dating design arguably strikes an optimal balance between maintaining experimental control and mimicking real-life relationship initiation.

Recently, Luo and Zhang (2009) have conducted a speed-dating study to examine the effects of actual similarity on initial attraction. Participants reported various interests, personality traits, attitudes (e.g., political affiliation), attachment style, and the Big Five personality dimensions. Surprisingly, the researchers were unable to find any significant effects to suggest that participants' actual similarity levels on these (and several other) measures are associated with attraction in a speed-dating setting. Nevertheless, one possible reason that this study did not detect significant findings for actual similarity is that participants were unable to accurately infer the traits and attitudes of their partners on a speed-date (a concern that is not relevant to the "bogus stranger" paradigm). Although 5 min is surely not enough time to learn a person's life narrative, several studies using a "thin slices" approach (Albright, Kenny, & Malloy, 1988; Ambady & Rosenthal, 1993; Levesque & Kenny, 1993) have found that individuals can predict some personality traits and attitudes with an impressive amount of accuracy after being exposed to another person for a very limited time period. In a typical thin slices study, participants make judgments about another person after a brief interaction, after viewing a short interview or video clip, or merely after viewing the target's face; these judgments are typically made after an exposure/interaction of 5 min or less (Ambady, Krabbenhoft, & Hogan, 2006). Many studies have found evidence that participants can accurately judge each of the Big Five traits in one or more of these situations, with extraversion and conscientiousness being especially easy to detect rapidly (Borkenau & Liebler, 1992; Dabbs & Bernieri, 1999). Participants reach accurate consensus in their judgments of other traits, such as sociosexuality, warmth, politeness, intelligence, and competence after viewing a brief video clip of the target (Gangestad, Simpson, DiGeronimo, & Biek, 1992; Prickett, Gada-Jain, & Bernieri, 2000). People can also judge a target's political leaning (Rule & Ambady, 2010) and career success (Rule & Ambady, 2008, 2009) after merely seeing the target's face. Overall, the thin slices literature shows that participants can gain much information from a very brief exposure to another person, and speed-dating capitalizes on these sophisticated social perceptual skills (Eastwick & Finkel, 2008; Finkel & Eastwick, 2008; Finkel et al., 2007; see also Houser, Horan, & Furler, 2007).

The Luo and Zhang (2009) speed-dating study did not include participants' perceived similarity ratings and thus could not determine the effects of such ratings on attraction. It is plausible that the perceived similarity-attraction effect also disappears when examining live face-to-face romantic encounters such as speed-dating. The goal of the current study is to explore this possibility by examining the effects of both actual and perceived similarity using a method similar to that of Luo and Zhang.

The current study

In previous work, researchers have generally measured actual and perceived similarity in one of two ways: specifically or generally. To assess *specific similarity*, researchers have used focused measures of traits or attitudes (e.g., "In general, I am very much in favor of smoking"; "In general, I enjoy gardening"; Byrne, 1971). For actual similarity calculations, researchers compare each participant's own self-ratings to his or her partner's own self-ratings. For perceived similarity calculations, researchers compare each participant's own self-ratings to his or her ratings of the partner. Assessing both actual and perceived similarity in this specific manner allows researchers to compare the effects of actual and perceived similarity on a parallel basis. However, to our knowledge, researchers have never included specific measures of *both* actual and perceived similarity when assessing initial romantic attraction via real dyadic interactions; most studies of this kind examine only one type of similarity measure: actual *or* perceived (e.g., Curran & Lippold, 1975; Luo & Zhang, 2009).

In other studies, however, researchers measure participants' *general similarity*, usually with a limited number of nonspecific items requiring participants to rate their overall similarity with a target (e.g., "How similar

are your attitudes to your interaction partner's attitudes?" Hoyle, 1993). Such assessments provide the researcher with a quick, holistic measure of participants' perceived similarity to the partner. However, general similarity measures can only capture perceived similarity; actual similarity cannot easily or accurately be determined with a general measure because actual similarity must be computed with reference to specific traits, attitudes, or values. That is, researchers can determine whether participants are actually similar in particular domains by administering scales or specialized items (e.g., Big Five, self-esteem), but participants' responses to one or two broad items (like the example general similarity item reported above) cannot be adapted to accurately compute overall levels of actual similarity. Thus, general measures of actual similarity are not available. Nevertheless, the association between romantic liking and the three other types of similarity measures—actual (assessed specifically), perceived (assessed specifically), and perceived (assessed generally)—have not yet been examined simultaneously.

Our goal is to fill the gap in the similarity-attraction literature by comparing actual and perceived similarity as closely as possible, while using the latest statistical and methodological approaches. We chose to examine personality traits and attitudes because these are the most frequently examined variables in this literature (see Montoya et al., 2008), and indeed, Luo and Zhang (2009) examined both attitudes and personality traits in their speed-dating examination of actual similarity.

Specifically, we hypothesized that actual similarity assessed with specific personality and attitude ratings will be weakly, and perhaps nonsignificantly, related to attraction. This prediction is congruent with Montoya and colleagues' (2008) report of a relatively weak association between actual similarity and attraction in studies involving short interactions. Although the meta-analysis included very few studies that examined live interactions with real potential romantic partners, we do not expect that our speed-dating methodology will produce a significant effect for actual similarity-attraction, given that the Luo and Zhang (2009) study was also unable to find such an effect.

In addition, we hypothesized that perceived similarity (assessed either with specific personality and attitude measures or with a general measure) will consistently predict attraction. As mentioned previously, researchers have identified significant effects of perceived similarity on attraction even in the absence of significant actual similarity effects, and Montoya and colleagues (2008) found that the perceived similarity-attraction effect was robust across all types of studies included in the meta-analysis. Therefore, we predict that perceived similarity—measured both specifically and generally—will significantly predict initial attraction. Furthermore, we hypothesized that the perceived similarity-attraction association will be significantly stronger than the actual similarity association when compared directly on the same items.

Method

Participants

One hundred and eighty-seven undergraduate students (93 female, $M_{age} = 19.6$) participated in one of eight speed-dating sessions to meet and "match" with opposite sex participants (see Finkel et al., 2007, for a detailed account of a different yet similar study). Participants were recruited for the sessions via on-campus flyers and informational e-mails. The sample included White/Caucasian (69%), Asian/Asian American (15%), Hispanic (3%), Middle Eastern (3%), and African American (2%) participants, as well as participants of other or mixed races (8%).

Procedure

Participants completed a 30-min online intake questionnaire approximately 11 days before their speed-dating session. This questionnaire assessed the person-level traits and demographics. During each event, participants had 4-min speed-dates with 11 or 12 individuals (depending on event attendance). Immediately following each date, they completed a ~2-min interaction record questionnaire, which included the measures relevant to that date.

Materials

Intake questionnaire

The intake questionnaire assessed numerous person-level traits. Those scales that are relevant to this study are described below.

Actual self characteristics. Participants assessed the extent to which 14 characteristics described their actual selves using a 1–9 agreement scale. The characteristics were as follows: "physically attractive," "sexy/hot," "good career prospects," "ambitious/driven," "fun/exciting," "funny," "responsive," "dependable/trustworthy," "friendly/nice," "charismatic," "confident," "assertive," "smart," and "intellectually sharp."

Big Five personality dimensions. This 20-item scale (Donnellan, Oswald, Baird, & Lucas, 2006) included four items assessing each of the Big Five personality factors: extraversion ($\alpha = .84$, $M = 4.59$, $SD = 1.68$), agreeableness ($\alpha = .74$, $M = 6.21$, $SD = 1.22$), conscientiousness ($\alpha = .74$, $M = 4.57$, $SD = 1.64$), neuroticism ($\alpha = .78$, $M = 3.25$, $SD = 1.59$), and openness ($\alpha = .65$, $M = 5.56$, $SD = 1.22$). Participants responded to these items using a 9-point scale (1 = *describes me very poorly*, 9 = *describes me very well*).

Sociosexuality. Participants completed the three attitude items from Simpson and Gangestad's (1991) Sociosexuality Orientation Inventory ("Sex without love is okay," "I can imagine myself being comfortable and enjoying 'casual' sex with different partners," "I would have to be closely attached to someone [both emotionally and psychologically] before I could feel comfortable and fully enjoy having sex with him or her" [reversed], $\alpha = .85$, $M = 2.93$, $SD = 1.59$) on a 1–7 agreement (1 = *strongly disagree*, 7 = *strongly agree*) scale.

Traditionalism. This two-item measure tapped individuals' attitudes toward traditional values ("I try to go to religious services regularly," "I want a traditional family," $\alpha = .54$, $M = 4.07$, $SD = 1.57$). Participants rated themselves on a 7-point agreement scale.

Political conservatism. This measure included four items ("I endorse many aspects of conservative political ideology," "I endorse many aspects of liberal political ideology" [reversed], "I would want any romantic partner of mine to endorse many aspects of conservative political ideology," "I would want any romantic partner of mine to endorse many aspects of liberal political ideology" [reversed], $\alpha = .82$, $M = 3.21$, $SD = 1.28$), which were rated on a 1–7 agreement scale. High scores indicated a politically conservative ideology, while low scores indicated a politically liberal ideology.

Major. Participants completed a free-response question asking them to indicate their academic major(s). Participants reported 76 distinct majors, which we grouped into 29 categories based on topical similarity (e.g., one category comprised biology, pre-med, biochemistry, and human biology majors). One hundred and one (54%) participants reported two or more intended majors. The three most common majors were economics (19%), psychology (12%), and political science (10%).

Interests. Participants were instructed to "check any of the following activities that you enjoy/participate in" for 21 listed interests (e.g., "watching sports," "dining out," and "playing music"). Participants indicated participating in 12.72 ($SD = 2.83$) of the provided interests on average.

Religion. Participants indicated their religious affiliation in response to a free-response question. In this sample, 34% of participants identified as Protestant/Other non-Catholic Christian, 27% of participants identified as Atheist/Agnostic, 14% Roman Catholic, 14% Jewish, and 10% Other.

State. Participants also reported their home state of residence in response to a free-response question. This sample consisted of 177 participants from 28 states, and 10 participants came from countries other than the United States. The 3 states most commonly reported were Illinois (21%), California (11%), and New Jersey (6%).

Interaction record

The interaction record assessed participants' perceptions of each date. Only items relevant to this report are discussed further.

Perceived partner characteristics. Participants also rated each speed-date on the 14 traits listed under actual self characteristics above. Here, participants were instructed to indicate the extent to which each partner possessed each trait, again on a 1–9 agreement scale.

Perceived similarity (general). Participants completed two items ("My interaction partner and I seemed to have a lot in common," "My interaction partner and I seemed to have similar personalities," $\alpha = .88$), indicating how similar to themselves they found each date to be. These were also completed on a 1–9 agreement scale.

Romantic liking. Participants completed four items assessing how much they liked their interaction partners using a 1–9 agreement scale ("I really liked my interaction partner," I was sexually attracted to my interaction partner," "I am likely to say 'yes' to my interaction partner," "My interaction partner and I had a real connection," $\alpha = .89$). This measure served as our primary dependent variable in this report.

Results

We approached this data set with three broad strategies. First, we examined the effect of *actual similarity* (assessed with specific trait and attitude ratings) on participants' reports of romantic liking for each other; for these analyses, the similarity metric was calculated using a report from the participant and a report from the partner to create an absolute value difference score (e.g., the absolute value of the difference between the participant's rating of his/her own political conservatism and the partner's rating of his/her own political conservatism). Second, we examined the effect of *perceived similarity* (assessed with specific trait and attitude ratings) on participants' reports of romantic liking for each other; for these analyses, the similarity metric was calculated using two reports from the participant (e.g., the absolute value of the difference between the participant's rating of his or her own physical attractiveness and his or her rating of the partner's physical attractiveness). We refer to this metric as *trait-specific perceived similarity*. Third, we examined the effect of perceived similarity (assessed as a broad holistic judgment) on participants' reports of romantic liking for each other; we refer to this metric as *general perceived similarity*.

In many of the analyses below, we calculated similarity as the absolute value of the difference between a participant's score on a variable and the speed-dating partner's score on the same variable. Difference scores can be confounded by their two component main effects (i.e., the two scores used to compute the difference score; see Griffin, Murray, & Gonzalez, 1999; Kenny, Kashy, & Cook, 2006), so we controlled for the two main effects in all the difference score analyses reported below (e.g., the analysis predicting romantic liking from the sociosexuality difference score controlled for both individuals' sociosexuality self-reports).[2] Also, when conducting the regression analyses, we reverse coded the difference score similarity metrics so that positive β values indicated a positive association of similarity with romantic liking. These participants contributed between 10 and 12 reports to the present data set ($N = 2{,}184$

2. Indeed, when we ran the analyses without controlling for these main effects, several of the previously nonsignificant analyses (e.g., physically attractive) reached significance. Further exploration indicated that this change in results was frequently because one of the two main effects was relatively large. For example, in the analysis testing the relation between physical attractiveness similarity and liking, the positive main effect of the partner's physical attractiveness was quite large in both the perceived, $\beta = .74$, $t(1982) = 41.35$, $p < .001$ and actual, $\beta = .21$, $t(1984) = 10.30$, $p < .001$, similarity analyses, and these omitted main effects caused the difference scores to exhibit spurious effects. In fact, many of the (appealing) traits we assessed revealed positive main effects on liking and could have produced spurious similarity effects had we not controlled for these main effects. In general, these data support the argument that the component main effects should be controlled to prevent misleading difference score results (Griffin et al., 1999).

total reports), and therefore, multilevel modeling (Raudenbush & Bryk, 2002) was used to account for the nesting of interaction partner within participants; the intercept was permitted to vary randomly.

Does actual similarity predict romantic liking?

To assess actual similarity on the 14 self characteristic variables, we calculated the absolute value of the difference between the participant's self-reported score on an actual self characteristic item and his/her partner's self-reported score on the same actual self characteristic item. We conducted 14 separate multilevel modeling analyses, one for each of the 14 characteristics, using all three characteristic variables—the participant's report, the partner's report, and the absolute value of the difference between the two—to predict the romantic liking scores. As mentioned above, we reverse coded the difference score when conducting the regression analyses so that significant positive values would indicate that greater similarity predicted romantic liking. However, as seen in Table 1, actual similarity only significantly predicted romantic liking for 2 of the 14 characteristic constructs ("dependable" and "friendly/nice"), and these two effects were in opposite of the predicted direction (i.e., dissimilarity predicted attraction). The fixed effect meta-analyzed β across all 14 analyses was −.006 ($z = -0.98$, $p = .325$).

We examined the remainder of the person-level constructs that were assessed with rating scales (Big Five personality factors, sociosexuality, traditionalism, and political conservatism) in a similar manner. We found that actual similarity predicted romantic liking significantly for sociosexuality and marginally for extraversion and political conservatism, all in the expected direction. None of the four other Big Five variables approached significance. The fixed effect meta-analyzed β across these eight analyses was .015 ($z = 1.91$, $p = .055$).

The actual similarity metric for three of the remaining variables (academic major, religion, and state) was coded dichotomously because these variables were not assessed using rating scales. That is, instead of using absolute value difference scores, participants and partners either exactly "matched" on an item (1) or did not (0). Participants who indicated multiple academic majors were considered "matched" with partners who shared at least one of the same majors. For the variable personal interests, the similarity metric consisted of the sum of the number of interests that the participant and the partner had in common (out of 21 possible interests). Results revealed that actual similarity marginally predicted romantic liking only for one of these four variables (religion). The fixed effect meta-analyzed β for these four analyses was .017 ($z = 1.54$, $p = .123$).

Across all 26 of the actual similarity analyses, the fixed effect meta-analyzed β was .005 ($z = 1.02$, $p = .307$). We found no systematic evidence that actual similarity predicted romantic liking; in fact, as previously noted, two of the three significant effects we found were in the opposite (negative) direction, although all three marginally significant effects were in the expected (positive) direction.

Does trait-specific perceived similarity predict romantic liking?

We then examined the association between participants' perceived similarity to a potential partner on the 14 characteristic variables and their reported levels of romantic liking for that partner. To assess perceived similarity on the 14 characteristic variables, we calculated the absolute value of the difference between the participant's self-reported score on an actual self characteristic item and his or her own rating of each partner on the same perceived partner characteristic item. Again, the analyses reported below also controlled for the two component main effects (i.e., the participants' two reports used to calculate the difference score).

As seen in Table 2, perceived similarity predicted romantic liking significantly for 7 of the 14 characteristic constructs ("sexy/hot," "good career prospects," "ambitious/driven,"

Table 1. *Means, standard deviations, and summary of regression analyses for actual similarity variables predicting romantic liking*

Variable	*M*	*SD*	β	*t*
Characteristic metrics				
Physically attractive	1.64	1.41	.01	0.61
Sexy/hot	1.99	1.50	.03	1.21
Good career prospects	1.42	1.25	.02	0.78
Ambitious/driven	1.74	1.55	−.02	−0.73
Fun/exciting	1.39	1.22	.02	0.82
Funny	1.40	1.13	.02	0.96
Responsive	1.43	1.10	−.03	−1.36
Dependable/trustworthy	1.15	1.08	−.05	−2.07*
Friendly/nice	1.25	1.13	−.08	−3.05**
Charismatic	1.80	1.45	.03	1.14
Confident	1.79	1.50	.01	0.50
Assertive	1.77	1.43	−.03	−1.31
Smart	1.14	1.05	−.02	0.97
Intellectually sharp	1.26	1.15	−.02	−0.73
Big Five characteristics				
Extraversion	1.97	1.42	.04	1.75†
Agreeableness	1.42	1.05	−.01	−0.32
Conscientiousness	1.85	1.31	−.02	−1.00
Neuroticism	1.86	1.33	.03	1.52
Openness	1.40	1.08	−.02	−0.71
Other metrics				
Sociosexuality	1.93	1.36	.08	3.25*
Traditionalism	1.84	1.34	−.01	−0.68
Political conservatism	1.44	1.08	.04	1.67†
Major[a]	0.14	0.35	−.01	−0.64
Interests[a]	8.99	2.79	.01	0.42
Religion[a]	0.23	0.42	.04	1.90†
State[a]	0.10	0.30	.03	1.36

Note. β values indicate the association between the participant's and partner's similarity on the relevant variable and the participant's report of romantic liking. Unless otherwise indicated, similarity was calculated as the absolute value of the difference between the relevant participant and partner variables (controlling for the two component main effects). All mean and standard deviation values excluding the last four indicate the average number of differing scale points between participants. In the analyses, variables were coded such that positive β values indicate that similarity was associated with greater romantic liking.

[a]The data for these four variables were not based on absolute value scores.

† $p < .10$. * $p < .05$. ** $p < .01$.

"dependable," "confident," "assertive," "smart," and "intellectually sharp") and marginally for 1 additional characteristic, all in the expected (positive) direction. The fixed effect meta-analyzed β for these 14 analyses was .050 ($z = 8.10$, $p < .001$). This value, although small, was significantly stronger than the meta-analytic average of the 14 actual similarity βs reported above, $z = -2.11$, $p = .018$ (Glass & Stanley, 1970).

Because participants completed the remainder of the items (Big Five, sociosexuality, traditionalism, political conservatism, academic major, religion, state, and personal interests)

Table 2. *Means, standard deviations, and summary of regression analyses for perceived similarity variables predicting romantic liking*

Variable	*M*	*SD*	β	*t*
Characteristic metrics				
Physically attractive	2.32	1.81	.01	0.33
Sexy/hot	2.30	1.74	.06	4.08**
Good career prospects	1.96	1.57	.13	4.41**
Ambitious/driven	1.90	1.58	.13	4.48**
Fun/exciting	1.83	1.59	.02	0.67
Funny	2.02	1.64	.03	1.32
Responsive	1.61	1.46	.02	0.72
Dependable/trustworthy	2.04	1.53	.12	2.93**
Friendly/nice	1.37	1.25	.01	0.19
Charismatic	1.84	1.57	.01	0.49
Confident	1.81	1.48	.06	3.10**
Assertive	1.84	1.48	.08	3.94**
Smart	1.35	1.22	.08	3.00**
Intellectually sharp	1.50	1.24	.05	1.91†

Note. β values indicate the association between the participant's and partner's similarity on the relevant variable and the participant's report of romantic liking. For all analyses, similarity was calculated as the absolute value of the difference between the relevant participant and participant perception of partner variables (controlling for the two component main effects) and romantic liking. For all variables, positive β values indicate that similarity was associated with greater romantic liking. All mean and standard deviation values indicate the average number of differing scale points between participants.
† $p < .10$. ** $p < .01$.

only for themselves during the intake phase of the study—that is, there were no perceived partner measures of these constructs—we were unable to compute perceived similarity scores on these items.

Does general perceived similarity predict romantic liking?

As participants' reports of trait-specific perceived similarity demonstrated a significant relationship with romantic liking, we also wanted to determine the relationship between their general perceived similarity levels (e.g., the judgment that one has "things in common" with the partner) and romantic liking. Results revealed a strong positive association between the two variables, $\beta = .75$, $t(1985) = 54.21$, $p < .001$, demonstrating that participants who generally perceived similarity with their speed-dating partners reported greater romantic liking for them as well. In summary, these findings provide further evidence that individuals' perception of similarity, especially when measured with a holistic, general measure, may better predict how much they like a potential partner than does their actual similarity, which did not predict attraction at all.

Social relations model

We also analyzed these data using the social relations model (SRM; Kenny, 1994; Kenny et al., 2006). Within the SRM, participants' ratings of a construct (e.g., romantic liking) can be divided into four independent components: the actor effect (i.e., the participant's average rating across targets), the partner effect (i.e., the average rating that participants give a target), the relationship effect (i.e., the level that a participant rates a target above and beyond the participant's actor effect and the target's partner effect), and error. Given that

similarity is a dyad-level variable, similarity would be most likely to predict the romantic liking relationship effect, which is the dyad-level component of romantic liking.[3] To examine this possibility, we calculated the similarity-attraction effect using SRM procedures that separate actor, partner, and relationship variance (see SAS statistical software code in the Appendix). This procedure calculates parameters separately for men and women.

Overall, the SRM results were extremely similar to those reported in Tables 1 and 2. For actual similarity, 19 of the 20 nonsignificant effects remained nonsignificant for both sexes (state became significant for both sexes). Of the 6 significant or marginal effects in Table 1, 4 remained significant or marginal and in the same direction for at least one sex (political conservatism and religion were no longer significant for either sex). The fixed effect meta-analyzed β was .004, $z = 0.35$, $p = .724$ for the 14 characteristics (averaged across men and women); $\beta = .027$, $z = 2.02$, $p = .044$ for the remaining 8 person-level constructs; $\beta = .049$, $z = 2.80$, $p = .005$ for the major, interests, religion, and state constructs; and $\beta = .020$, $z = 2.58$, $p = .010$ for all 26 actual similarity analyses. For perceived similarity, the 6 nonsignificant effects reported in Table 2 remained nonsignificant for both sexes and the 8 significant or marginal effects remained significant or marginal for at least one sex. The perceived similarity fixed effect meta-analyzed β was .069, $z = 6.85$, $p < .001$, for the 14 characteristics, and this β significantly differed from the actual similarity β for the 14 characteristics, $z = -2.44$, $p = .007$. In summary, the SRM analyses replicated the results reported above: Actual similarity was weakly associated with romantic liking, perceived similarity significantly predicted romantic liking, and the actual and perceived similarity associations with liking significantly differed from each other.

3. Similarity also emerges in SRM analyses in the form of "assumed similarity," which is the association of the participant's self-rating on a variable with his or her actor effect on the same variable (Kenny et al., 2006). This kind of similarity is not relevant to the similarity-attraction hypothesis and thus we do not address it in this report.

Discussion

Although researchers from various disciplines have examined the link between similarity and liking over the past several decades, a consensus concerning the true nature of this association remains elusive. The purpose of this study was to contribute to the scholarly understanding of this effect by examining initial romantic encounters using contemporary methodological and statistical approaches. To our knowledge, all three of the predictor variables we examined—specific actual similarity, specific perceived similarity, and general perceived similarity—have not been used concurrently to examine initial romantic processes within the same study. By juxtaposing them, we were able to determine which type of similarity measure best predicts initial romantic liking in this contemporary methodological setting (i.e., speed-dating). Overall, results revealed three meaningful conclusions.

First, unlike many well-known and well-cited previous studies (e.g., Byrne et al., 1970), we found that actual similarity did not predict romantic attraction. In fact, similarity was significantly or marginally related to romantic liking for only 6 of the 26 constructs assessed, and only 4 of the 6 results were in the expected direction. Yet some of these results are supported by the previous literature. Albright and colleagues (1988) found that extraversion is the personality trait that is easiest to identify accurately during a brief exposure to another person. If participants can accurately infer extraversion in others with ease, this could explain the present finding that of the Big Five constructs, only similarity on extraversion had an effect (albeit marginally significant) on liking. We also found a significant effect of sociosexuality similarity on liking, and sociosexuality shares some conceptual overlap with extraversion (Eysenck & Eysenck, 1964; Schmitt & Shackelford, 2008). Perhaps actual similarity-attraction effects in short interactions such as speed-dating can only

emerge for traits that can be identified readily and accurately. However, accuracy considerations alone cannot explain why we did not detect actual similarity-attraction effects for the myriad other traits that participants perceive accurately in initial encounters, such as career prospects, responsiveness, intelligence, conscientiousness, and political orientation (Gangestad et al., 1992; Prickett et al., 2000; Rule & Ambady, 2008, 2009, 2010). Neither can the personality versus attitude similarity distinction explain our effects, as both types of similarity largely revealed nonsignificant effects on attraction.

As mentioned previously, two significant actual similarity-attraction effects were contrary to the expected direction: Participants' levels of actual similarity on the items "dependable" and "friendly/nice" actually negatively predicted romantic liking. We are admittedly puzzled by these significant dissimilarity-attraction effects, and we are reluctant to interpret them. Indeed, if the actual similarity-attraction effect is null in initial romantic interactions, then we would very well expect 1 or 2 of our 26 tests to be significant in either the positive or negative direction due to chance. The finding that actual similarity was not consistently or strongly related to romantic liking (either positively or negatively) across a variety of personality and attitudinal qualities is consistent with some theories (Sunnafrank, 1992) and is inconsistent with the hypothesis that actual similarity predicts liking.

Second, we found that when measured specifically (i.e., for specific traits and attitudes), perceived similarity significantly or marginally predicted romantic liking for 8 of the 14 examined characteristics in the expected direction. That is, when participants' perceived similarity was measured with various individual characteristics, it was a reliable predictor of romantic liking. The actual and perceived similarity findings in conjunction suggest that when perceived and actual similarity are both measured in the same manner, perceived similarity is a significantly stronger predictor of liking than is actual similarity. One reason for this discrepancy could be that people use information about themselves to infer how traits covary in others (Critcher & Dunning, 2009). For example, if I am a pre-med student (i.e., I have good career prospects) who is also ambitious, I might be more likely than an English major to infer that a fellow pre-med speed-dating partner is also ambitious, even in the absence of information about that person's ambition. Therefore, it might be easier for perceived than actual similarity-attraction effects to emerge because people can draw upon their schemas to infer perceived similarity across many traits even in the absence of concrete evidence (see Sunnafrank, 1991). Our findings are congruent with the work of other researchers who contend that participants' perception of similarity to another person is the only element of similarity that is truly related to liking (Condon & Crano, 1988; Sunnafrank, 1985). This is the first study to support this hypothesis, which investigated face-to-face initial interactions between potential romantic partners.

Very similar results emerged when the data were analyzed using the SRM. The actual similarity effect was smaller than the perceived similarity effect ($\beta = .027$ vs. $\beta = .069$, respectively, for the 14 partner characteristics), and the pattern of results was similar to those of the multilevel modeling absolute value analyses. In fact, the patterns of significance were identical in both types of analyses for 23 of the 26 actual similarity effects and for all 14 perceived similarity effects. Overall, the similarity between the multilevel modeling and SRM analyses provides strong support for our conclusions that in a brief initial speed-dating encounter, actual similarity is not associated with romantic liking, but specific perceived similarity significantly (albeit weakly) predicts romantic liking.

Third and finally, we also examined the relation between general perceived similarity (i.e., how similar participants feel to one another overall) and romantic liking. We found a very strong relation between the two: Participants who reported high perceived similarity scores also reported high romantic liking scores. This result demonstrates that when assessed using a general, holistic

measure, perceived similarity serves as a better predictor of romantic attraction than either actual or perceived similarity assessed specifically. In fact, although both the specific and general perceived similarity-attraction effects were significant, their effect sizes differed dramatically ($\beta = .05$ and $\beta = .75$, respectively). Whereas perceived similarity demonstrated a relatively weak association with romantic liking when assessed specifically, the strength of the association between general perceived similarity and romantic liking suggests that participants may not actually distinguish between general perceived similarity and romantic liking. Indeed, because this is a correlational study, the causal direction of this association is unknown. It is quite possible that attraction also leads to a judgment of high general perceived similarity (Morry, 2005, 2007). The positive relation between general perceived similarity and romantic liking is not a new discovery (Hoyle, 1993); however, by using this measure in the same study as the other two predictors, we were able to demonstrate the considerable strength of this type of measure relative to the two specific similarity measures. Nevertheless, part of the large difference in the size of the specific versus the general perceived similarity-attraction associations could be the fact that this alternative causal pathway is more likely to be true for the general than for the perceived measure.

Limitations and strengths

This study has several limitations. Although speed-dating events mimic real-world initial interactions better than most, if not all, methods currently used, they are not analogous to some frequently encountered social interactions that lead to romantic attraction (e.g., classrooms). At a speed-dating event, all participants are guaranteed to meet each attending member of the opposite sex, and thus, speed-dating could yield encounters between people who would not actually interact in other real-world settings. Although speed-dating events are growing in popularity as a way to meet potential romantic partners, not all individuals may be interested in participating in this type of event. Therefore, our sample was probably limited to only those participants who felt that this form of interaction would be a fun or intriguing experience. Also, all our participants were between 18 and 22 years old, so these results may only generalize to a young college-aged population. Older individuals plausibly could be seeking different traits in a romantic partner and thus could evidence different preferences for similarity. In essence, as the reported results derive from research employing the speed-dating methodology with undergraduates, we cannot be sure that the obtained results necessarily extend beyond this context.

Also, although the speed-dating paradigm offered several advancements in testing the similarity-attraction hypothesis, the current results are based solely on one brief encounter between participants. Perhaps stronger actual similarity effects would emerge if the same group of participants could attend multiple similar events across several weeks to experience a greater number of structured interactions with each potential partner. Such an elaborate study would be an excellent design to test how the importance of similarity changes over time. Alternately, perhaps researchers could give participants the opportunity to interact with only a few potential partners without the time pressure inherent to speed-dating events to determine whether similarity can better predict attraction after longer "dates."

Finally, although we were able to compare the size of the specific actual similarity-attraction effect with the size of the specific perceived similarity-attraction effect, we could not create a truly parallel general actual similarity measure with which to compare general perceived similarity. Our sense is that it is not possible to calculate a measure of actual similarity (which requires a report from each partner) without referencing specific traits or attitudes, but perhaps future researchers can develop a general, holistic measure of participants' actual similarity.

However, this study also has several strengths. As discussed previously, we used the most up-to-date methodologies both for collecting our data and for analyzing it. Our

study design is similar to other recent romantic interaction studies (Houser et al., 2008; Luo & Zhang, 2009), which also captured the reports of both people participating in each study session; this feature provided a fuller picture of each partner's experiences on his or her "dates." Furthermore, by statistically controlling for the component main effects (e.g., the participant's and the partner's physical attractiveness levels) in the difference score analyses, we were able to ensure that our similarity-attraction effects were not confounded or artificially inflated (see Footnote 2).

Also, unlike many other studies on similarity, the current study strictly focused on the importance of actual and perceived similarity in genuine initial romantic interactions. Although the similarity-attraction effect has been thoroughly tested previously, few studies have examined it in such a true-to-life fashion; this is a considerable shortcoming of prior research given that participants' romantic behaviors and preferences show substantial differences between paper-based and real-life paradigms (Eastwick, Finkel, & Eagly, 2011). Because our study comprised reports from participants who were actually meeting potential romantic partners, it presents an especially authentic picture of the link between similarity and liking during the early formation of romantic relationships.

Conclusions

This study provides evidence that, despite the prevailing lay belief and corpus of supporting academic work, actual similarity is weakly and inconsistently related to romantic attraction in face-to-face initial romantic speed-dating encounters. On the other hand, perceived similarity did reliably predict attraction. A general, holistic measure of perceived similarity was a strong predictor of liking in these speed-dating encounters, which may indicate that a judgment of general perceived similarity is in effect an overall judgment of attraction. The effect of general perceived similarity on romantic liking was much stronger than the small yet significant effects of perceived similarity calculated with respect to specific traits.

These findings suggest that actual similarity might better serve as a "law of relationship maintenance" than as a "law of attraction." Previous research has shown that actual similarity successfully predicts outcomes in developing relationships and marriages (Karney & Bradbury, 1995; Luo et al., 2008; Luo & Klohnen, 2005; cf. Montoya et al., 2008). However, the results of the current study suggest that actual similarity may not reliably predict attraction in face-to-face initial romantic encounters. Hopefully these findings, in conjunction with other recent work, will encourage future researchers to reexamine the similarity-attraction link using modern methodologies and actual interaction paradigms in an effort to further illuminate this potentially misunderstood phenomenon.

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Appendix

SAS code used to conduct social relations model analyses

```
PROC MIXED COVTEST maxiter=4000;
  CLASS MaleID FemaleID Event_ID Sex;
  MODEL RomanticLiking = Male Female
      Male*MaleSmart Male*FemaleSmart
    Female*MaleSmart Female*FemaleSmart
      Male*SmartSimilarity
    Female*SmartSimilarity / S NOINT ddfm
      =SATTERTH;
  RANDOM Male Female / TYPE=CSH
      SUB=Event_ID gcorr;
  RANDOM Male Female / TYPE=CSH
      SUB=MaleID(Event_ID) gcorr;
  RANDOM Male Female / TYPE=CSH
      SUB=FemaleID(Event_ID) gcorr;
  REPEATED Sex / TYPE=CSH SUBJECT
      =MaleID*FemaleID(Event_ID);
  RUN;
  QUIT;
```

Note: The data set had two rows for each dyad: one in which the male provides the

dependent variable, and one in which the female provides the dependent variable.

MaleID—categorical variable indicating the male participant user ID

FemaleID—categorical variable indicating the female participant user ID

EventID—categorical variable indicating which event (1–8) the participants attended

Sex—categorical variable indicating the sex of the participant (identical to the variable Male)

Romantic Liking—dependent variable rating of romantic liking (for one participant)

Male—dummy variable indicating whether the dependent variable report is the male's

Female—dummy variable indicating whether the dependent variable report is the female's

MaleSmart—male's self-rating for smart

FemaleSmart—female's self-rating for smart

SmartSimilarity—absolute value of the difference between the male and female self-ratings for smart