Is actual similarity necessary for attraction? A meta-analysis of actual and perceived similarity

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Is actual similarity necessary for attraction? A meta-analysis of actual and perceived similarity

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ABSTRACT
To evaluate the impact of actual and perceived similarity on interpersonal attraction, we meta-analyzed 460 effect sizes from 313 laboratory and field investigations. Results indicated that the associations between interpersonal attraction and both actual similarity ($r = .47$) and perceived similarity ($r = .39$) were significant and large. The data also indicate that (i) actual similarity was important in no-interaction and short-interaction studies, (ii) there was a significant reduction in the effect size of actual similarity beyond no-interaction studies, and (iii) the effect of actual similarity in existing relationships was not significant. Alternatively, perceived similarity predicted attraction in no-interaction, short-interaction, and existing relationship studies. The implications of perceived similarity, rather than actual similarity, being predictive of attraction in existing relationships are discussed.

KEY WORDS: attraction • complimentarity • liking • marriage • meta-analysis • perceived similarity • relationships • similarity effect

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Tremendous anecdotal and empirical evidence indicates that similarity breeds attraction. This phenomenon – dubbed the *similarity effect* – has been evidenced using personality traits (e.g., Banikotes & Neimeyer, 1981; Bleda, 1974), attitudes (e.g., Byrne, Baskett, & Hodges, 1971; Tan & Singh, 1995), physical attractiveness (e.g., Peterson & Miller, 1980; Stevens, Owens, & Schaefer, 1990), and hobbies (e.g., Curry & Emerson, 1970; Werner & Parmelee, 1979), and has been documented in both laboratory manipulations (e.g., Byrne & Nelson, 1964; Storms & Thomas, 1977) and field investigations of existing relationships (e.g., Amos, 1971; Carli, Ganley, & Pierce-Otay, 1991). Based largely on the strength of the laboratory data, Byrne and Rholesey (1965) labeled the positive linear relationship between the proportion of similarity and attraction the *law of attraction*, and bolstered by hundreds of subsequent replications of the similarity-attraction relationship, researchers came to regard the similarity effect as a fundamental rule of attraction (e.g., Berscheid & Walster, 1978; Byrne, 1971). Indeed, Berger (1975) proclaimed that the similarity effect is “one of the most robust relationships in all of the behavioral sciences,” (p. 281) whereas Layton and Insco (1974) declared that the similarity effect is “one of the best documented generalizations in social psychology” (p. 149).

Despite overwhelming empirical evidence and ubiquitous anecdotal evidence in support of similarity’s influence on interpersonal attraction, numerous questions have been raised regarding the integrity of the effect. Some authors discount the similarity effect as a result of demand characteristics (Sunnafrank, 1991), low accuracy or awareness of others’ actual attitudes (Newcomb, 1961), or methodological flaws (Bochner, 1991; Rosenbaum, 1986). Others have questioned the order of causality (Morry, 2005, 2007), or demonstrated that the similarity effect is eliminated by an initial interaction (Sunnafrank & Miller, 1981; Sunnafrank, 1983). These critics conclude that the similarity effect is only evident when the research is (i) conducted in the laboratory using ad hoc dyads (rather than using people in existing relationships), and (ii) involves experimental manipulation of similarity (rather than measuring the effect of similarity in existing relationships). These arguments propose that the similarity effect may be merely a laboratory phenomenon rather than one that influences “actual” relationships.

In addition, researchers have made the distinction between actual similarity – the degree to which one is *actually* similar to another individual – and perceived similarity, the degree to which one *believes* oneself similar to another. Whereas some researchers maintain that actual similarity is critical for producing attraction (e.g., Byrne, 1971), others argue that only perceived similarity is necessary to produce attraction (e.g., Condon & Crano, 1988; Hoyle, 1993; Ptacek & Dodge, 1995; Werner & Parmelee, 1979). In an assessment of attitude similarity in married couples, for example, Buunk and Bosman (1986) uncovered nonsignificant actual similarity-attraction correlations ranging between .05 and .20, but found significant perceived similarity-attraction correlations ranging between .20 and .56.

The current research investigated the potential of actual and perceived similarity to predict attraction in both laboratory and field investigations.
We did so by conducting a meta-analysis of investigations of the similarity effect. We begin by (i) introducing the operational and theoretical differences between perceived and actual similarity and (ii) explaining how these theoretical differences translate into and are predictive of effects in ad hoc and field investigations.

**Actual versus perceived similarity**

**Actual similarity**

Actual similarity refers to an interpersonal situation in which two individuals share attributes (Byrne, 1971). Actual similarity has been studied in “real-world” contexts (e.g., by assessing individuals’ personalities with a standardized personality assessment, calculating the similarity between the personalities, and then measuring attraction between friends; Duck & Craig, 1978) and also in the laboratory. With respect to laboratory investigations, Byrne (1961a) developed a laboratory procedure to investigate the relationship between similarity and interpersonal attraction based on a method developed originally by Smith (1957). The procedure, dubbed the *phantom-other technique*, began with participants completing a self-report measure of attitudes. Next, participants were asked to participate in a person-perception task in which they form an impression of and then evaluate another person (the target). Actual attitude similarity is manipulated by presenting a simulated target who is either attitudinally similar or dissimilar. After receiving the similarity information, the participant typically completes the Interpersonal Judgment Scale (IJS; Byrne & Wong, 1962), on which the participant evaluates the target’s intelligence, knowledge of current events, morality, and adjustment, as well as how much the participant would like the target, and to what extent the participant would like to work with the target. The last two items are summed to produce the assessment of interpersonal attraction. Research using the phantom-other technique consistently documents that individuals are more attracted to those who actually hold similar, rather than dissimilar, views (Byrne, 1971; Byrne, Clore, & Smeaton, 1986).

To explain the relationship between similarity and attraction, Byrne (1971) borrowed concepts from cognitive dissonance and social comparison theories (Festinger, 1954, 1957) and classical conditioning to argue that similar attitudes serve as reinforcers. According to Byrne’s perspective, individuals have a fundamental need for a logical and consistent view of the world (called *the effectance motive*). Individuals favor stimuli that reinforce the logic and consistency of their world. People who agree with us validate our ideas and attitudes and in so doing, reinforce the logic and consistency of our world (i.e., satisfy our effectance motive). Similar people are reinforcing and thus, are associated with positive feelings, which in turn, lead to attraction. People who disagree with us create inconsistency in our world (i.e., do not satisfy the effectance motive) and are associated with anxiety and confusion, feelings that lead to repulsion or, at the very least, a lack of attraction.
Perceived similarity
One might also argue that the reinforcing value of similarity depends not
on actual similarity as much as on perceived similarity. Indeed, a need for
consistency is fulfilled if one deludes oneself into believing that others
believe what one believes (as suggested by the false consensus bias; Ross,
Greene, & House, 1977). In fact, researchers have suggested that what is
most critical for predicting attraction is that individuals believe their partners
are similar, regardless of whether the partner is actually similar to them (e.g.,
Condon & Crano, 1988). Perceived similarity’s influence on attraction may
be due to satisfaction of the effectance motive, but has also been attributed
to cognitive biases and self-esteem maintaining processes that cause individ-
uals to believe that targets are similar to them (Levinger & Breedlove,
1966). More specifically, a high degree of perceived similarity has been
hypothesized to result from the aforementioned false consensus bias (Ross
et al., 1977), balance theory (Heider, 1958; Newcomb, 1968), the belief that
relationship partners are supposed to be similar to one another (Morry,
2005, 2007), or using the self as a reference point (Rosch, 1975). Sillars (1985),
for example, suggested that perceived similarity assessments are inflated arti-
ficially because relationship partners use their own perspective as a reference
for evaluating others – despite past behavior that may be to the contrary.

Similarity in the laboratory and the field
But do the empirical data support the claims of actual and perceived simi-
liarity? When considering the impact of actual and perceived similarity on
attraction, one can consider the difference between laboratory and field
studies. Alternatively, one might consider each research project with respect
to the amount of interaction (no-interaction, short-interaction, or existing
relationship) the individual has with a target before the assessment of inter-
personal attraction. We investigated the relative influence of actual and
perceived similarity using both classification schemes.

The important distinction between laboratory and field studies is how
they assess or manipulate similarity: Laboratory studies manipulate the
attributes of an unmet other in an artificial context for the purposes of
examining the effects of similarity on attraction, whereas field studies do
not include a manipulation of the target’s attributes. In so doing, laboratory
studies provide little more than the similarity information as a basis for
judgment. Alternatively, in field studies, sometimes months of experiences,
memories, and interactions contribute to the information available.

With regards to the amount of interaction classification variable, research
projects can be placed into one of three categories: no-interaction (i.e., the
phantom-other technique), short-interaction (e.g., the participant and a pre-
viously unacquainted target meet for 5–10 minutes before the assessment
of attraction), and existing relationships (i.e., partners who have interacted
at great length and in a variety of contexts). Although the impact of actual
similarity on attraction in no-interaction studies (i.e., most laboratory
studies) is largely unquestioned (Berscheid & Walster, 1978; Byrne, 1971;
Hatfield & Rapson, 1992), Sunnafrank and Miller (1981), in particular, argue
that the phantom-other context is artificial: The phantom-other technique provides attitudinal information about a target person before a time in which information about a target would normally be learned. After all, in “natural” relationships, individuals do not learn initially the target’s ten relevant attitudes or their agreement or disagreement with these attitudes. Initial interactions tend to be marked by pleasant shallow conversations – where disagreement would be more indicative of a violation of social norms than a source of attitudinal punishment (McLaughlin, Cody, & Rosenstein, 1983; Sunnafrank, 1991). Sunnafrank (1983, 1985, 1986) demonstrated that a short interaction eliminates the impact of actual similarity on attraction, whereas other investigators have found that the effect for actual similarity persists through a short interaction (Byrne, Ervin, & Lamberth, 1970; Cappella & Palmer, 1992).

Investigations of the similarity effect in existing relationships (i.e., most field studies) tend to find small, but positive, effects for actual similarity (e.g., White & Hatcher, 1984). Cappella and Palmer (1992) propose that similarity would continue to lead to attraction in existing relationships because (i) similarity provides continuous reinforcement throughout the relationship, and (ii) dissimilarity should eventually be extinguished due to the lack of reinforcement (also see Davis & Rusbult, 2001). As such, we expect actual similarity to be associated with attraction in no-interaction studies and for similarity’s association with attraction to be smaller but significant in short-interaction and existing relationship studies.

With respect to perceived similarity, we expected it to be associated with attraction in both field and laboratory investigations. In laboratory studies, perceived similarity should predict attraction due to the salient similarity manipulation (Byrne, 1992) and the potential reinforcement value of the perceived similarity. In short-interaction or existing relationships, perceived similarity should be associated with attraction because (i) perceived similarity should lead to attraction and (ii) attraction should increase perceived similarity. These bidirectional effects are initiated by forces that maintain self-esteem (Ross et al., 1977) and produce cognitive biases (e.g., Sillars, 1985).

The present meta-analysis

The purpose of this meta-analysis was to assess the relationship between (a) actual similarity and interpersonal attraction, and (b) perceived similarity and interpersonal attraction, as investigated in laboratory and field investigations.

We decided a priori to operationalize the similarity effect using only attitudes or personality traits. The reasons for this decision are twofold: First, the dominant theory of similarity, the reinforcement model of attraction (Byrne, 1961b; 1971), argues that only stimuli associated with reinforcement should lead to attraction, and as such, other types of similarity (e.g., hobbies) may be only negligibly associated with reinforcement. Second, research that investigates attraction as a function of other types of similarity
(e.g., hobbies, activities) is scant. Numerous investigations have assessed similarity of physical attractiveness, activities, or hobbies, but few of these studies correlate this similarity with attraction.

In an effort to investigate thoroughly the similarity effect, we assessed numerous other factors that may contribute to the influence of similarity on attraction. For example, does the type of relationship (e.g., friendship versus marriage) moderate similarity’s influence on attraction? Does it matter to the similarity effect if the target is thought to be similar on personality traits versus attitudes? Specifically, we assessed the possible moderating effects of proportion of attitudes used in the manipulation of similarity, whether the study investigated attitudes or personality traits, the centrality of the attitudes used, the type of relationship investigated (stranger, friendship, romantic partner), set size (how many attitudes/personality traits were used in a manipulation/assessment of similarity), sample size, and type of attraction assessment (e.g., IJS versus behavioral measure). We also assessed the basic demographic and methodological characteristics of the studies: We coded for author(s), location, source (journal, edited volume, thesis or dissertation, and unpublished manuscript), sample (college students, adults, or schoolchildren), year, recruitment method (participant pool, monetary incentive, or volunteer), and sex composition of the sample.

**Method**

**Sample of studies**

We began by conducting an electronic literature search using the PsycINFO (1887 – July 2004) and Dissertation Abstracts International (1861 – July 2004) databases. Keywords were “assumed,” “attitude,” “attraction,” “complimentary,” “congruence,” “dissimilarity,” “homogamy,” “ideal self,” “liking,” “perceived,” “personality,” “reinforcement-affect,” “repulsion,” and “similarity.” We also sent a request for relevant studies to an Internet discussion forum commonly used by social psychologists (spsp-discuss@stolaf.edu). Additionally, we conducted a backward search of reference sections of the retrieved articles until we found no new entries. Finally, we contacted 15 investigators, all of whom had published research repeatedly on the topic, to request copies of any relevant unpublished or in press articles.

**Inclusion criteria**

In an effort to assess the similarity effect as precisely as possible, we included only studies that satisfied the following criteria for the independent and dependent variables.

**Assessed actual or perceived similarity.** We selected only those studies that compared similar with dissimilar attitudes, or similar with dissimilar personality traits. We excluded studies of similarity of needs; this exclusion relates most to complementarity research (e.g., Meyer & Pepper, 1977). We also excluded a number of studies that assessed the similarity of relationship
members (e.g., Kirkpatrick & Hobart, 1954; Precker, 1951; Thompson & Nishimura, 1952) because these studies do not report the relationship between the extant similarity and attraction.

We narrowed the search further by focusing on attraction between individuals who were not nested within a larger group. Studies excluded on the basis of this criterion included those that compared attraction of individuals in a similar group with attraction among those in a dissimilar group (e.g., Hansson & Fiedler, 1973). We excluded these studies because research indicates that attraction among ingroup members is mediated by intragroup factors (such as entitativity; Gaertner, Iuzzini, & Witt, 2006) and as a result, does not reflect a “pure” assessment of interpersonal similarity.

Studies that were classified as perceived similarity studies assessed the degree to which participants believed/perceived the target to be similar to themselves with respect to the relevant attributes (either personality traits or attitudes). Most commonly, perceived similarity was measured using a question similar to, “To what degree are you (attitudinally) similar to the target person?” It is important to note that for almost every laboratory and field study, the assessment of perceived similarity was made after the assessment of the participant’s own attributes. This order of assessment facilitated a similar level of salience for the assessed attributes for the perceived similarity assessments across field and laboratory studies.

A study was classified as a “perceived similarity” study if the study correlated the participant’s perceived similarity with the participant’s attraction for the target person. Alternatively, a study was classified as an “actual similarity” study if the study correlated the manipulated or measured level of similarity with the participant’s attraction for the target person.

**Interpersonal attraction.** We included studies in which the dependent variable was a behavioral or affective assessment of interpersonal attraction. We also included eight studies that compared differences between satisfied and unsatisfied relationships (e.g., unstable marriage partners versus stable marriage partners) as the measure of interpersonal attraction. Kurdek (2000) noted a strong relationship between satisfaction and attraction in marital relationships, whereas White and Hatcher (1984), in a review of couple complementarily and similarity research, concluded that there is a strong relationship between attraction, satisfaction, and marital stability. Thus, for these eight studies, an effect for similarity was computed by contrasting the degree of similarity between satisfied and unsatisfied couples.

**Study sample**

The search strategy and selection criteria resulted in 313 studies. From these studies, we extracted 460 similarity-dissimilarity comparisons. Four hundred and six of the effect sizes assessed actual similarity and 54 assessed perceived similarity. The sample included 72 effect sizes extracted from dissertations and 15 effect sizes from otherwise unpublished datasets. The total sample of 460 effect sizes had a total sample size of 35,747 participants. Sample sizes ranged from 10 to 614 (M = 83.52, SD = 75.66).
Data coding
Three coders coded all of the studies. Coding for the variables were compared, and discussion between coders occurred until a consensus was reached.

Laboratory vs. field study. We coded this factor as a categorical variable with two levels: laboratory study and field study. Studies that characterized the “laboratory” condition were those studies that either (i) paired participants with imagined partners whose characteristics (i.e., attitudes, personality traits) were created and manipulated by the experimenter, or (ii) paired the participant with an unacquainted other, exchanged similarity-relevant information, and manipulated the amount of time participants interacted with one another. “Field” studies were characterized by assessing the degree of similarity with an actual relationship partner without manipulation of the partner’s attributes (i.e., both participants held their own attitudes).

Amount of interaction. We coded amount of interaction as a categorical variable with three levels: no-interaction, short-interaction, and existing relationship. In studies classified as no-interaction, participants never interacted with, but did receive information about, the target other before the assessment of interpersonal attraction. In studies classified as short-interaction, participants first received information about, then interacted with (between 5 minutes and a few hours) a previously unacquainted target other. Existing relationship studies measured similarity between relationship partners (e.g., non-romantic relationships, acquaintanceships, dating relationships, or married couples). Due to the nature of laboratory and field studies, laboratory studies could only be classified as no-interaction or short-interaction studies, whereas field studies could only be classified as short-interaction or existing relationship studies.

Other variables. For each similarity-dissimilarity comparison we coded basic descriptive information and additional variables for exploratory and sensitivity analyses. These variables included: set size, proportion of similarity, attitude versus personality trait study, centrality of attitudes, type of attraction assessment, author and full citation, source (journal, edited volume, thesis or dissertation, and unpublished manuscript), sample (college students, adults, or school children), year of publication, type of personality traits measured (specific personality trait, complete scale), type of relationship (stranger, friend, boyfriend/girlfriend, marriage partner), recruitment method (participant pool, monetary incentive, or volunteer), sample size, and sex composition of the sample (all men, all women, men and women in interactions that were homogenous with respect to sex, or men and women in interactions that were heterogeneous with respect to sex).

Statistical methods

Effect sizes used. The effect-size index was Fisher’s Z (Fisher, 1928), calculated such that greater positive values indicated greater attraction for
similar others and negative values indicate more attraction for dissimilar others. An effect size of zero indicates no relationship between similarity and interpersonal attraction. Following the recommendations of Rosenthal (1994), we used the effect size $Z$ because of its conceptual superiority over effect size $d$ for studies involving continuous data. However, although we used $Z$ in all analyses, we report and discuss the data using $r$ because of its greater familiarity to most readers (Hedges & Olkin, 1985).

**Random-effects model.** When conducting a meta-analysis, researchers select either a fixed-effects model or random-effects model (Field, 2001; Hunter & Schmitt, 2000). We selected a random-effects model for two reasons. First, we were interested in making unconditional inferences that generalized to a hypothetical population of studies that could exist rather than to the studies included in the present sample (Hedges & Vevea, 1998). Fixed-effects models only consider the randomness associated with the sampling of participants into experiments and of treatment conditions into experiments. Random-effects models consider not only the randomness that accompanies the sampling of participants into studies, as fixed-effects models do, but also the randomness due to sampling studies from a larger sample of possible studies (Hedges & Vevea, 1998). The generalizability of the results of random-effects models is broader than the results of a fixed-effects model; in other words, conclusion drawn from random-effects models generalize to contexts of all possible operational definitions, whereas conclusions drawn from fixed-effects models generalize only to contexts involving the operational definitions used by the meta-analyzed studies.

The second reason for selecting random-effects models was the tendency for data to violate the assumption of homogeneity (i.e., all effect sizes estimate a common population effect; Field, 2001; National Research Council, 1992). Fixed-effects models tend to be more powerful than random-effects models when its homogeneity assumption is met. When the assumption is violated, however, fixed-effects models underestimate the standard errors of parameter estimates and inflate the Type I error rate. Monte Carlo simulations, for example, indicate that the Type I error rate (which is usually set at .05) ranges between .43 and .80 in heterogeneous fixed-effects models (Field, 2003). We computed a $Q$-statistic for each analysis to test the assumption of homogeneity. A significant $Q$-statistic indicates heterogeneity by detecting the additional uncertainty not captured by the fixed-effects analyses. In the case of a significant $Q$-statistic, the random-effects model is the appropriate test of meta-analytic hypotheses.

**Sensitivity analyses.** Mixed-effects models are random-effects models with explanatory variables added to the model. Because a meta-analysis is inherently a correlational process, it is likely that the design of the model will be unbalanced and that the interactions between moderators will be difficult to interpret. To determine if a potentially important moderator was excluded from our analyses, we conducted additional analyses in which each potential moderator was included one at a time into the a priori model. Our
interests were: (i) whether other significant predictors of the similarity effect would emerge and, (ii) whether these findings would produce a significant interaction with the included moderators (i.e., amount of interaction, field versus laboratory study). We closely inspected field studies because of the likelihood that only certain types of field studies (i.e., personality trait similarity, romantic relationship studies) could be significantly associated with attraction, whereas other similarity studies (i.e., attitude similarity) may not.

Results

Actual similarity

Overall effect. Before assessing the overall effect sizes of the similarity effect, a $Q$-test was performed to determine whether it was statistically plausible that the true variance component was zero. The variance component was significant (0.11), $Q(405) = 4082.17, p < .05$. Fixed-effects models, which do not model this variability, are misspecified: the $p$-values from a fixed-effects model would be inaccurately low because these models would underestimate the standard errors of model parameters. To model this variability, we used the random-effect estimate. The resulting population effect sizes were interpreted using Cohen and Cohen’s (1983) suggestion that an $r$ of at least .10 be labeled a “small effect,” an $r$ of at least .24 a “medium effect,” and an $r$ of at least .37 a “large effect.” The overall similarity effect was significant and large, $r = .47$ (95% CI: .44, .50), $\chi^2(1) = 809.17, p < .05$.

Laboratory analyses. We first selected only those studies that were defined as laboratory studies. This selection procedure resulted in a sample of 337 effect sizes. A $Q$-test of the null hypothesis that the true variance component is zero was significant (variance component = 0.05), $Q(336) = 2820.28, p < .05$. Using a random-effects estimate and as displayed in Table 1, the effect

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<td>Short interaction</td>
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<td>Laboratory studies</td>
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Note. Effect sizes with an asterisk are significantly different from zero at $p < .05$. 
size for laboratory studies was descriptively large ($r = .59$; 95% CI: .55, .63) and different from zero, $z = 29.61, p < .05$. Inspection of Figure 1 indicates that the effect sizes are distributed fairly symmetrically (beyond a slight truncation of the distribution for negative effect sizes) around the mean.

Next, we tested whether there was a difference between short-interaction and no-interaction studies. The similarity effect was larger in no-interaction studies ($r = .54$) than in short-interaction studies ($r = .21$), $\chi^2(1) = 39.77, p < .05$.

**Field analyses.** Similar to the laboratory results reported above, we selected only those studies that were defined as field studies. This selection procedure resulted in a sample of 69 effect sizes. A $Q$-test of the null hypothesis that the true variance component is zero was significant (variance component = 0.06), $Q(68) = 166.33, p < .05$. Using a random-effects estimate, the effect size for field studies was small ($r = .12$; 95% CI: .03, .20) and different from zero, $z = 2.79, p < .05$.

Figure 2 displays a scatterplot of the effect sizes for field studies by sample size. Inspection of the scatterplot indicates a mild absence of studies with a negative effect and an abundance of studies with small positive effects and small samples. It is important to note that Figure 2 shows that all of the studies with large samples, which better represent the true population mean, have a mean near zero.

Next, we investigated whether the amount of interaction moderated the similarity effect within field studies. The mixed-effects analysis revealed...
that amount of interaction was not significant, $\chi^2(1) = 1.06, p = .30$. However, it is important to note that the classification of “field study” included studies that assessed existing relationships (e.g., the assessment of actual dating, friendship, or marital relationships) as well as short-interaction studies (e.g., a computer dating study in which participants were unknowingly paired by similarity). Closer inspection of the mean effect size for short-interaction and existing relationship studies demonstrated that although the mean effect size for short-interaction studies exceeded zero, $r = .20 (k = 23; 95\% \text{ CI: .05, .33}), z = 2.72, p < .05$, the effect for existing relationships did not, $r = .08 (k = 42; 95\% \text{ CI: -.02, .19}), z = 1.43, p = .15$.

**Amount of interaction analyses.** We analyzed the entire sample of studies (i.e., combined both laboratory and field studies) to investigate further the potential moderating effect of amount of interaction. More specifically, we investigated the size of the similarity effect as a function of amount of interaction. The random-effects analysis revealed a significant main effect for amount of interaction, $\chi^2(2) = 84.73, p < .05$, an effect that was explored using orthogonal contrasts. The first contrast compared existing relationship and short interaction studies with no-interaction studies. The second contrast assessed the difference between existing relationships and short-interaction studies. The first contrast indicated that the similarity effect is more potent for no-interaction studies ($r = .54$) compared with studies in which any previous interaction occurred before the assessment of attraction ($r = .15$), $z = 9.17, p < .05$. The second contrast, which compared short
interactions \((r = .19)\) with existing relationships \((r = .08)\), was not significant, \(z = 1.20, p = .22\).

**Perceived similarity**

**Overall effect.** We selected only those studies that assessed perceived similarity. This selection procedure resulted in a sample of 54 effect sizes. Before assessing the overall effect sizes of perceived similarity, a \(Q\)-test was performed to determine if it was statistically plausible that the true variance component was zero. The variance component was significant \((0.01), Q(53) = 501.78, p < .05\). Using the random-effects estimate, the overall effect for perceived similarity was significant and descriptively large, \(r = .39\) \((95\% CI: .35, .42), \chi^2(1) = 343.50, p < .05\).

**Laboratory analyses.** We selected only those studies that were defined as laboratory studies, resulting in a sample of 17 effect sizes. A \(Q\)-test of the null hypothesis that it is plausible the true variance component is zero was significant \((variance\ component = 0.01), Q(16) = 160.01, p < .05\). The effect size was descriptively large \((r = .49; 95\% CI: .43, .54)\) and different from zero, \(z = 14.59, p < .05\).

**Field analyses.** We selected only those studies that were defined as field studies, resulting in a sample of 37 effects. A \(Q\)-test of the null hypothesis that the true variance component is zero was significant \((variance\ component = 0.01), Q(36) = 218.60, p < .05\). Using the random-effects estimate, the effect size for field studies was moderate \((r = .32; 95\% CI: .27, .37)\) and different from zero, \(z = 12.21, p < .05\).

Next, we explored if the amount of interaction moderated the similarity effect within field studies. The mixed-effects analysis revealed that amount of interaction was not significant, \(\chi^2(1) = 0.00, p = .98\).

However, similar to the previously described analysis for actual similarity in field studies, we inspected more closely the mean effect sizes for short-interaction and existing relationship studies. The results indicated that the association between perceived similarity and attraction was significant in both short-interaction studies, \(r = .34\) \((95\% CI: .23, .45), z = 5.81, p < .05\), and existing relationships, \(r = .32\) \((95\% CI: .26, .37), z = 10.75, p < .05\).

**Sensitivity analyses**

**Additional moderators.** We conducted additional analyses to assess the influence of factors that may produce an interaction with the amount of interaction variable. In this set of analyses, we investigated (i) any interactive influence of any moderator on the amount of interaction variable, and (ii) any moderator that may impact the significance of the similarity effect in existing relationship studies.

To conduct the first set of analyses, different moderators were placed into the model with amount of interaction variable with an interaction term.
No moderator produced a significant interaction with the amount of interaction variable: Type of Attraction Assessment × Amount of Interaction, $\chi^2(5) = 7.36, p = .19$; Set Size × Amount of Interaction, $\chi^2(2) = 3.01, p = .22$; Attitude Versus Personality Trait Study × Amount of Interaction, $\chi^2(2) = 2.28, p = .31$; Type of Participant × Amount of Interaction, $\chi^2(2) = 0.38, p = .82$; Proportion of Similarity × Amount of Interaction, $\chi^2(1) = 0.01, p = .92$.

For the second set of analyses, we investigated whether any moderator was associated with the similarity effect to a greater or less extent in existing relationship studies. Such an analysis is important because it may specify the type of similarity that is or is not associated with attraction in existing relationships. No moderator influenced significantly the size of the similarity effect in existing relationship studies: type of attraction assessment, $\chi^2(3) = 1.89, p = .59$; set size, $\chi^2(1) = 1.93, p = .16$; attitude versus personality trait studies, $\chi^2(1) = 0.08, p = .77$; type of participant, $\chi^2(2) = 0.28, p = .86$; and type of relationship, $\chi^2(3) = 4.51, p = .21$.

**Perceived similarity.** Perceptual biases may cause individuals to overestimate the degree of intracouple similarity (Holyoak & Gordon, 1983). To investigate if such biases caused an inflated perceived similarity estimate, an additional sensitivity analysis investigated how perceived similarity was calculated. Perceived similarity was assessed using one of two techniques: (i) the experimenter asked the participant the degree to which the target other and the participant were similar with respect to the attributes in question, or (ii) the experimenter assessed the participant’s attributes as well as the participant’s perception of the target’s attributes, then the experimenter computed a difference score. A comparison of the two techniques revealed that one technique did not result in greater perceived similarity-attraction estimate than the other, $\chi^2(1) = 1.47, p = .56$.

**Publication bias.** The distribution of actual similarity effect sizes in Figure 2 demonstrates a mild disproportionate absence of field studies with negative effect sizes. To investigate the role of publication bias in determining the actual presence of this effect, we employed a computer program designed by Vevea and Woods (2005). The program allows for the implementation of different weight functions based upon the probability of an article being published given its $p$-value. We applied a weight function that assumed that studies with $p$-values of less than .005 are always observed, studies with $p$-values between .005 and .010 are observed 99% of the time, .050 to .100 are observed 90% of the time, .100 to .250 are observed 70% of the time, .250 to .500 are observed 40% of the time, .500 to .650 (i.e., studies with negative effects) are observed 35% of the time, .650 to .750 are observed 30% of the time, .750 to .875 are observed with a probability of .20, and .875 to 1.00 are observed 15% of the time. When we imposed this weight function, it resulted in a transformed mean of 0.029, with a standard error of 0.021. This resulted in nearly an 81% attenuation in the magnitude of the similarity effect in field studies. After applying this weight function, the
overall similarity effect in field studies was no longer significant, \( z = 1.37, p = .17 \). This adjusted estimate represents the mean effect given that the weight function (which was based on the distribution of effects in Figure 2) accurately represented the probability of publication. Additional sensitivity analyses using different weight functions to represent the probability of a specific study's inclusion likelihood also resulted in a severe attenuation in the power of the similarity effect and nonsignificant comparisons relative to a zero effect.

**Discussion**

Over the years, hundreds of laboratory studies have illustrated the dynamic power of similarity to produce attraction and have, in so doing, confirmed conventional wisdom that similarity plays an important role in romantic relationships. Consistent with this accepted notion, laboratory data overwhelmingly supported similarity's influence on attraction: Similarity produced a large effect in laboratory studies, \( r = .59 \). However, the association between actual similarity and attraction was significantly lower after a short interaction (\( r = .21 \)), and was not detectable in existing relationships (\( r = 0.08 \); an effect that accounts for less than 1% of the overall variance). This pattern of results is consistent with qualitative reviews of the similarity effect (e.g., Sunnafrank, 1991). In comparison, perceived similarity not only demonstrated a strong relationship in no-interaction studies, but also in short-interaction and existing relationship studies.

**Discontinuity between laboratory and field Investigations**

One critical finding of this meta-analysis was that the association between actual similarity and attraction decreased as the amount of interaction increased – so much so that we failed to detect an effect of actual similarity on attraction in existing relationships.

An effect for actual similarity, however, at least according to the theoretical underpinnings, should have great external and ecological validity – reinforcement from similar attitudes should be equal to, or more powerful, in established relationships than it is in the laboratory. According to Cappella and Palmer (1992), the reinforcement from attitude similarity should increase as the length of the relationship increases due to the continuous and perpetual reinforcement of similar attitudes and the minimization and eventual extinction of dissimilar attitudes (see also Davis & Rusbult, 2001). So, what could have caused the failure to detect an effect? Below, we discuss several of the potential factors for the failure of this powerful laboratory effect to generalize to existing relationships.

**Environmental factors.** Byrne (1992) suggests that environmental cues during a short interaction dilute the impact of similarity on attraction. More specifically, Byrne suggests that factors such as room temperature (Griffitt, 1970), background music (May & Hamilton, 1980), target race (Byrne &
Wong, 1962), or physical attractiveness (Hatfield & Sprecher, 1986) are “presumably … interpreted and cognitively processed by the subject on the basis of what he or she believes about attractiveness, dominant behavior, specific attitudinal processes, etc.” (Byrne, 1992; p. 194). Thus, each of these factors contributes to the attraction to the target, usurps influence from similarity, and decreases the possibility that researchers detect the impact of similarity.

Factors such as ambient temperature and background music, however, would seem to have a more profound influence on initial interactions than on established, long-term relationships. Conceptually and empirically, long-term relationships tend to be founded on the persistent attributes of others (e.g., Altman & Taylor, 1973; Buss, 1995), and as such, similarity of attitudes or personality traits should be a critical determinant of interpersonal attraction in relationships.

**Methods used to assess and manipulate attraction and similarity.** The techniques used to assess the similarity effect may have contributed to the relatively small effect size observed in field studies. Many of the methods used to assess and measure similarity may be appropriate for the laboratory, but not for the field. Duck and Craig (1975, 1978), for example, found that different types of personality similarity are important at different stages of a relationship: Similarity on easily accessible personality traits produced attraction early in relationships, whereas similarity on fundamental core traits produced attraction in established relationships. Thus, studies of similarity in existing relationships may produce small to negligible effect sizes principally because they fail to tap “core” traits or attitudes.

**Information salience.** Another potential explanation for this finding is that field studies suffer from a lack of salience that undermines the similarity-attraction link. As an example of the power of salience, one of the arguments in the television violence-aggression link indicates that violence viewed in the laboratory produces powerful effects due to the salience of the recently observed violence (Driscoll, 1982; Zillmann, 1998). A similar interpretation may apply to the similarity effect. In laboratory studies, participants often receive the target’s attributes immediately preceding their attraction assessments (high attitude salience). In contrast, field studies often collect a partner’s attitudes separately from the participant’s attitudes (low attitude salience). Relatively low salience of the partner’s attributes may inhibit the responder’s ability, either consciously or unconsciously, to acknowledge the paired affective response that would accompany the stimuli and would, in turn, guide attraction. Under such attitude non-salience, similarity would be unlikely to lead to attraction. Taking this argument to a further extreme, it may even be that in existing relationships, participants are surprisingly unaware of their partner’s attitudes toward many topics (such as attitudes toward abortion, discotheques, or novels) or personality traits (Kenny & Acitelli, 2001; Wilson & Dunn, 2004). This lack of awareness – or inaccuracy (Furnham & Henderson, 1983) – may then be responsible for the failure to
find an association between actual similarity and attraction (e.g., Feinberg, Miller, & Ross, 1981).

**Role of communication.** One explanation for the reduction of the similarity effect in short-interaction versus the no-interaction conditions focuses on the pattern of communication undertaken by participants in initial conversations. When individuals initiate conversations with novel others, they often do so with the purpose of establishing stable, predictable communication patterns (Heider, 1958; Sunnafrank & Miller, 1981). According to this perspective, we are attracted to those with whom we are able to achieve stable interaction patterns. Sunnafrank and Miller propose that this is what is responsible for the reduction of the similarity effect in short-interaction studies: Participants experienced attraction to both similar and dissimilar others in the short-interaction studies because participants – independent of their attitudes – were equally able to establish stable and predictable communication patterns.

**Desensitization.** A final possibility is that a reinforcement derived from a similar attribute decreases over time. As with certain foods or music, the size of a reinforcement derived from the rewarding stimulus deteriorates with repeated exposures to the stimuli (e.g., Hsee & Rottenstreich, 2004). Thus, in existing relationships, the influence of actual similarity may be less detectable because the size of the reinforcement received from similar attributes has decreased over repeated exposures.

**Perceived similarity and existing relationships**

As noted above, the influence of perceived similarity on attraction in existing relationship studies was moderate and significant. So, why does perceived similarity predict attraction in existing relationships whereas actual similarity does not? Although actual similarity may not predict attraction in existing relationships due to the aforementioned factors, the ability of perceived similarity may be attributable to cognitive biases (Sillars, 1985), self-esteem maintaining forces (Ross et al., 1977), or beliefs that relationship partners are similar to one another (Morry, 2005, 2007; Sunnafrank, 1992). Alternatively, it is likely that just as perceived similarity leads to attraction, so does attraction lead to perceived similarity (Morry, 2005, 2007). Several authors have proposed that individuals change their beliefs of similarity toward an admiring other to facilitate consonance in cognitions (Amodio & Showers, 2005; Sampson & Insko, 1964; Wyer, 1974). For example, in a cross-lagged panel analysis, Granberg and King (1980) found that attraction toward political figures led to the presumption of similarity to the self. Alternatively, Murray, Holmes, Bellavia, Griffin, and Dolderman (2002) found that attraction led to increased perceived similarity, such that perceived similarity resulted from satisfied relationship members assimilating their relationship partner into their own self-concept.

However, past research has noted that actual similarity between relationship partners does not tend to increase as the length of the relationship
increases (Hunt, 1935; Wilson & Cousins, 2003; but see Davis & Ruschult, 2001). Thus, the relation between perceived, but not actual, similarity and attraction in existing relationships may be due to the combined influences of (i) perceived similarity on attraction (which, as noted above, is magnified by cognitive biases and self-esteem maintaining forces) and (ii) attraction on perceived similarity.

Implications of perceived, rather than actual, similarity
If perceived similarity is more potent than actual similarity in the attraction process, what implications would this have on models that depend on actual similarity between relationship partners?

Evolutionary model of similarity. Some theorists have argued that there is a genetic or evolved attraction to those who are similar in attitudes or personality traits. Russell, Wells, and Rushton (1985), for instance, propose that mating with a genetically similar other is evolutionarily advantageous because such pairings result in a greater percentage of one’s genes being passed on to the offspring (i.e., one’s own genes, plus the genes that are shared with the mating partner, are passed on). This drive for a genetic bonus is widespread among humans and other species and has been argued for both psychological (Botwin, Buss, & Shackelford, 1997; Thiessen & Gregg, 1980) and physical traits (Spuhler, 1968; Susanne & Lepage, 1988).

If one were to accept the drive for this genetic bonus as the primary mating motivation, one would note first the consistent trend for actual similarity between relationship partners (e.g., Botwin et al. 1997; Buss, 1995; Kirkpatrick, 1937; Terman, 1938), but then note the current finding that similarity is not related to attraction in existing relationships. If their model were held to be true, the pattern of data elicited from the current article translates into the rather unsettling suggestion that the drive for genetic similarity overrides needs for a satisfying or rewarding relationship. That is, genetic similarity leads to relationships, but not to attraction within the relationship. It is interesting to note that this proposition has support from Burley (1983), who argued that relationship members who pair with others with undesirable characteristics (such as mental illness) were more concerned with genetic similarity than individual fitness or satisfaction.

Conflict resolution. Laypersons and researchers have assumed that similarity between partners is important to relationships because it leads to better relationships. Esterberg, Moen, and Dempster-McCain (1994) argued that similarity is critical to marriage because the increased agreement and common knowledge reduces conflict, which then facilitates attraction and prolongs marriage. Dissimilarity, according to this approach, causes problems because (i) dissimilarity results in different expectations for marriage roles, and even more interesting, (ii) dissimilar couples elicit less support from family and friends.

The results of the current analysis, however, indicate that the influence of actual attitude or personality trait similarity on interpersonal attraction in
existing relationships cannot be detected, whereas the influence of perceived similarity on attraction is strong. This finding indicates that (i) other factors beyond actual personality trait or attitude similarity are associated with marriage resolution (e.g., self-disclosure, communication skills, resolution skills), (ii) perceived similarity is a cue to a happy marriage, but that actual similarity leads to longer marriages (see Botwin, Buss, & Shackelford, 1997; Mascie-Taylor, 1988), but not happier marriages (Burleson, Kunkel, & Birch, 1994).

Finally, the absence of actual similarity, but the presence of perceived similarity, may lead to additional negative consequences in committed relationships. Sunnafrank (1992) postulates that a discrepancy between perceived and actual similarity may result in strain in relationships because it leaves individuals surprised and disappointed when dissimilarity is eventually detected. The shock of dissimilarity may lead to perceptions of deception and disingenuousness (Planalp & Honeycutt, 1985), which then result in anger and destructive conflict within the relationship.

**Conclusion**

In their informative chapter on interpersonal attraction, Berscheid and Walster (1978) answer the question of whether similarity leads to attraction with “a resounding yes” (p. 4). The results of this meta-analysis indicate a qualification to this conclusion: similarity leads to attraction in the laboratory setting, not in existing relationships. These results indicate that researchers would be well-served to investigate factors that have been demonstrated to be more potent predictors of attraction in existing relationships than actual similarity, such as reciprocation of liking (Montoya & Insko, 2008), physical attractiveness (Berscheid & Walster, 1978; Townsend & Levy, 1990), commitment (Rusbult, 1983), factors that contribute to the increased assessment of the quality of the target (Altman & Taylor, 1973; Montoya & Horton, 2004), and perceived similarity. Of course, before the field of psychology strikes a stake into the heart of actual similarity as a primary contributor to attraction in existing relationships, it would be wise to develop techniques that are capable of assessing similarity accurately and that are immune to the shortcomings described previously.

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