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SIMILARITY AND LIKING EFFECTS ON INTERPERSONAL ATTRACTION: TEST OF THE TWO-DIMENSIONAL TRUST-RESPECT MODEL

Ramadhar SINGH[1)], Amanda GOH[2)], Krithiga SANKARAN[3)], and Naureen BHULLAR[3)]

[1)]Ahmedabad University, Ahmedabad, India
[2)]National University of Singapore, Singapore
[3)]Indian Institute of Management Bangalore, India

In the two-dimensional cognitive model of interpersonal attraction, (a) trust in willingness to facilitate goals/needs of each other and (b) respect for capacity to execute that willingness have been postulated to be necessary for relationship development. However, the extant literature shows supremacy of trust over respect in drawing two strangers together. Thus, the present authors hypothesized that trust and respect might drive attraction equally when the partner's liking for the participant is known along with attitude similarity between them. When attitude similarity and partner's liking were manipulated and both respect and trust were measured before attraction in an experiment conducted in Singapore ($N = 176$), there were similar additive effects on the three responses of trust, respect, and attraction. Importantly, and as hypothesized, trust and respect equally mediated the similarity and liking effects when trust was conceptualized as preceding respect in determining attraction.

Key words: similarity-attraction, inferred liking, information integration, liking-attraction

Two-dimensional Model of Attraction

In everyday life, people encounter a wide variety of new persons. To survive and thrive among them, some individuals are preferred over others as acquaintances, collaborators, friends, or lifetime partners (Dunbar, 1993; Tooby & Cosmides, 1996). While choosing them, "... people must, first, determine the intentions of the other person[s]... and, second, their ability to act on those intentions" (Fiske, Cuddy, & Glick, 2007, p. 77). Further, they infer intention from *warmth*, *morality*, or *other-profitability* and ability from *agency*, *competence*, or *self-profitability* of others, and assign greater importance to the former than the latter in approaching them (Cuddy, Fiske, & Glick, 2008; Peeters, 2002; Wojciszke, 2005).

Interpersonal attraction, which is assessed by responses to items such as wanting to know the person, liking to meet the person, and desiring to be with the person (Byrne, 1971; Montoya & Horton, 2004), involves similar two cognitive responses. Given that two strangers would have common context-dependent goals/interests, each may raise two questions: Would the other person *like* me and how *good* is he or she? According to

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Correspondence concerning this article should be addressed to Ramadhar Singh, Amrut Mody School of Management, Ahmedabad University, CICT Building, Central Campus Navrangapura, Ahmedabad 380009, Gujarat, India (e-mails: singhr@ahduni.edu.in; profsingh1945@gmail.com).

Montoya and Horton (2014), answering the first and second questions entails the respective cognitive assessments of willingness (i.e., *will* the partner "... facilitate the interests/goals of the perceiver?") and capacity (i.e., *can* the partner "... meet activated goals?"; p. 64). Interpersonal attraction develops essentially from how such assessments translate themselves into trust in and respect for each other.

Findings that warmth-related traits determine liking more than respect but ability-related traits do the opposite (e.g., Hamilton & Fallot, 1974; Oden & Anderson, 1971; Singh, Onglatco, Sriram, & Tay, 1997; Singh & Teoh, 2000; Wojciszke, Abele, & Baryla, 2009) seemingly support the aforementioned two-dimensional trust-respect model of attraction. To us, however, the model could be supported unambiguously only when the supposedly cognitive responses of trust and respect would be shown to be jointly transmitting the effect of the manipulated information to the attraction measured. The first purpose of this research was to provide one such test of the model.

For simplicity in exposition, we will use the respective terms of trust and respect for cognitively evaluated *willingness*, *benevolence*, *or other-profitability* and *competence*, *agency*, *or self-profitability* of the partner throughout this article. Following Singh et al. (2015), moreover, we conceptualize trust as a personal belief that the interacting partners would respond favorably to needs and goals of each other (Rempel, Holmes, & Zanna, 1985) and respect as a socially shared belief in a partner's agency (Baryła, 2014).

Mixed Evidence

Some previous investigators considered trust, respect, or both as mediators of the effect of personality-trait information on social evaluations. In particular, they manipulated positive *versus* negative traits and measured the mediator(s) before liking or attraction. A significant reduction in the effect of the independent variable (IV) on the dependent variable (DV) when both the IV and the measured mediating variable (MV) predicted the DV was adjudged as mediation (Baron & Kenny, 1986). However, we found evidence for the two-dimensional model from such studies to be rather mixed. While the effect of warmth-related information on liking was solely mediated by trust, the relationship between respect and liking was only "reciprocal spillover" (Wojciszke et al., 2009, p. 984). When interpersonal attraction was the DV, the effect of the other-profitable trait was mediated by trust but that of the self-profitable trait was mediated by respect (Singh et al., 2009).[1]

In studies addressed to attraction from other kinds of information, support for the model was equally mixed. On the one hand, effects of personal evaluations of (that included liking for) the participant by the partner on attraction were fully mediated by a single MV of respect (Singh, Ho, Tan, & Bell, 2007; Singh, Lin, Tan, & Ho, 2008). On the other hand, liking effects on reciprocated attraction were fully mediated by another single MV of trust (Montoya & Insko, 2008). The only measured MV of respect (Montoya & Horton, 2004, Experiment 1), inferred attraction (Singh, Chen, & Wegener, 2014,

[1] When the value of a single self-profitable trait was varied, respect was a stronger mediator than trust, a finding supportive of the two-dimensional model. However, when the very same self-profitable trait was crossed with a single other-profitable trait, the effect of the former was mediated by respect alone, a finding that is inconsistent with the two-dimensional model.

Experiment 1), or trust (Singh et al., 2015, Experiment 1) fully mediated even attitude similarity effects on attraction. Collectively, these findings argue for sufficiency of either respect or trust as a causal variable in interpersonal attraction.

One reason for the foregoing evidence for a unidimensional, instead of the proposed two-dimensional, model of attraction might be the singly measured MV *per se*. When similarity *versus* dissimilarity between attitudes of the partner and those of the participants was manipulated within the attraction paradigm (Byrne, 1971, 1997) and the multiple MVs were measured, respect was generally a weaker MV than inferred attraction (Singh et al., 2014; Singh, Ng, Ong, & Lin, 2008, Singh, Yeo, Lin, & Tan, 2007) or trust (Singh et al., 2015). More interestingly, trust originated from not only attitude similarity between two persons but also the preceding MV of respect or inferred attraction. Put differently, the MVs appeared to be *sequential* (i.e., the preceding MV also affecting the mediation by the succeeding one) rather than *parallel* (i.e., each MV operating independently of others) processes (Hayes, 2013) in drawing people together (Singh et al., 2015). These findings highlight the merit of the two-dimensional model of attraction and the need for further research to specify the circumstances under which both trust and respect might be equally important MVs.

Social scientists have long been interested in understanding the *liking effect* (Beckman & Secord, 1959; Gouldner, 1960) and the *similarity effect* (Byrne, 1961). The *liking effect* refers to a tendency in people to be attracted to those who like them (Montoya & Horton, 2012). The *similarity effec*t refers to a tendency in people to be drawn to those who hold similar attitudes and values (Montoya & Horton, 2013; Montoya, Horton, & Kirchner, 2008). As we noted, the *liking effect* is mediated by trust; the *similarity effec*t is mediated by respect and trust.[2] Thus, providing the participants with information about the partner's liking for them and attitude similarity between them and then measuring both trust and respect before attraction may yield a clear evidence for precedence of trust to respect as the earlier quotation from Fiske et al. (2007) implied as well as for an equal importance of trust and respect as the two key cognitive dimensions of interpersonal attraction.

Expressed or inferred liking signals acceptance of the participant by the partner (Singh et al., 2014). Further, both the manipulated (Montoya & Insko, 2008) and inferred liking (Singh et al., 2015) determine attraction via trust. Given explicit information about willingness of the partner to enter into the relationship, therefore, trust can be rather certain. What might still require attention and effort would be generating respect from the manipulated attitudes (Lydon, Jamieson, & Zanna, 1988; Singh et al., 2014) and liking as well as from the preceding trust (Singh et al., 2015) already built by those manipulations. Thus, our Hypothesis 1 was that trust and respect should be equally important MVs of the similarity and liking effects on attraction when the sequential effect of the preceding MV of trust on the succeeding MV of respect would be recognized.

[2] The similarity-attraction effect is also mediated by positive affect in the participants and inferred attraction of the partner towards the participant (Singh et al., 2014, 2015; Singh, Ng, et al., 2008; Singh, Yeo, et al., 2007). Given our central interest in testing the two-dimensional cognitive model in this study, we omitted the causal role of positive affect at this point of time.

Issues of Missing Liking Information and Positive-Negative Asymmetry

Our simultaneous manipulations of attitude similarity and partner's liking required us to revisit the three models proposed by Insko et al. (1973) for such set of two stimuli. Model 1 was analogous to a single-mediation model (Baron & Kenney, 1986) in which attitude similarity was assumed to have an effect on attraction via inferred liking (Aronson & Worchel, 1966; Condon & Crano, 1988). Model 2 posited a causal chain from attitude similarity → attraction → inferred liking and then back to attraction. Model 3 regarded the levels of similarity and liking as mere pieces of positive or negative information that are integrated into attraction responses (Kaplan & Anderson, 1973; Montoya & Horton, 2004).

Insko et al. (1973) jointly manipulated attitude similarity, liking, sex, and photo attractiveness and also attitude similarity alone in Experiment 1 and attitude similarity and sex in Experiment 2. The effect of information about attitude similarity alone was seemingly stronger than that of the three types of information presented together. Further, participants had inferred liking from given attitude similarity. Based on these findings, Insko et al. concluded for Model 2 but against Models 1 and 3. To us, however, the first finding of a greater effect of attitude similarity information when presented alone than when presented with other kinds of information could be an outcome of a weighted average of the values of information given (Kaplan & Anderson, 1973).[3] Also, when participants would infer missing information about liking and average the inferred value with the value of given information, effects of attitude similarity presented alone on attraction would depend upon how inferences are made (see, e.g., Singh, 1991, 2011, for a discussion of inferences about missing information in judgment and decision making).

Some existing research is suggestive of the averaging of the inferred and given values in attraction. When Insko et al. (1973, Experiment 2) classified their participants into those who had made liking inferences as a positive function of the proportion of similar attitudes *versus* those who had made liking inferences to be just ambivalent independent of attitude similarity, the similarity effect was indeed stronger in the former group than the latter one. In Byrne and Ervin (1969), in contrast, attraction responses from attitude similarity alone fell rather neatly between the extremely high and low liking levels as if the inferred value to the missing liking information were moderate. Given such evidence for both ways of inferring missing liking information, we contend that attraction responses from attitude similarity alone (i.e., a control condition, Singh, 1998) can be either stronger than or equal to those from the similarity and liking information presented together. More specifically, responses can be stronger when inferred liking would increase with the increasing attitude similarity (e.g., Byrne & Rhamey, 1965; Insko et al., 1973) but parallel to those from the manipulated liking when inferred liking would take on a constant value

[3] When information about X and Y are presented, attraction according to the averaging rule (Anderson, 1981) is $A_{XY} = (w_{Xi}s_{Xi} + w_{Yj}s_{Yj})/(w_{Xi} + (1 - w_{Xi})$, wherein A_{XY} is attraction from the two pieces of information, w_{Xi} and s_{Xi} are the respective weight and scale value of a particular piece of X information, and w_{Yj} and s_{Yj} are the respective weight and scale value of a particular piece of Y information. The relative weights sum to 1, a condition for the averaging rule. When the single piece of information, either X or Y, is presented, it takes the full weight. Thus, the effect of a piece of information is stronger when it is presented alone than when it is paired with another piece of information.

(Byrne & Ervin, 1969).

To us, therefore, Model 3 of Insko et al. (1973) appears to be more promising than Model 2 on two grounds. First, liking effects were consistently stronger than similarity effects on attraction (Byrne & Ervin, 1969; Byrne & Griffitt, 1966; Byrne & Rhamey, 1965; Clore & Baldridge, 1970; Singh, 1975; Singh, Ho, et al., 2007; Singh, Lin, et al., 2008). Second, information about similarity and liking is ideally suited for facilitating cognitive evaluations of respect (Montoya & Horton, 2004) and trust (Montoya & Insko, 2008) as in the two-dimensional cognitive model of interpersonal attraction (Montoya & Horton, 2014). Therefore, we agree with Byrne and Rhamey (1965) who suggested that liking might represent similarity in more important attitudes toward the self than attitude similarity in impersonal issues of ranking of schools and environmental protection.

Viewing liking and similarity as different pieces of information raised another issue of positive-negative asymmetry in attraction. As the literature shows (e.g., Peeters & Czapinski, 1990), negative information takes on a greater weight than does positive information in attention and judgments. Thus, when dissimilar attitudes and/or disliking for the participant would take on greater weights than similar attitudes and/or liking for him or her, the two factors would produce an interaction effect (Anderson, 1981; Kaplan & Anderson, 1973). That is, the effect of one type of information would be smaller at the negative than the positive level of the other type of information (e.g., Singh & Ho, 2000; Singh, Ho, et al., 2007; Singh & Teoh, 2000).

The similarity-dissimilarity asymmetry in attention is more likely when people have depleted rather than ample cognitive resources (Jia & Singh, 2009; Tan & Singh, 1995). Further, the interaction between similarity and liking is more likely when attraction alone is measured (Insko et al., 1973, Experiment 1) than when attraction is measured after respect, that is, fillers items of Byrne's (1961) Interpersonal Judgement Scale (Byrne & Ervin, 1969; Byrne & Griffitt, 1966; Clore & Baldridge, 1970) or positive affect (Singh, 1975). In a direct test of such interference of the weighting strategy across responses, similarity and liking interacted when attraction was measured first but not when it was measured after respect (Singh, Lin, et al., 2008).

Given our plan to assess the two cognitive responses of trust and respect before attraction, Hypothesis 2 was that the similarity and liking manipulations should have additive effects on all three responses. We made no specific prediction about inferred value to the missing liking information in the control condition of attitude similarity. Nevertheless, we expected the inferred liking value to have a uniform pattern (i.e., either increasing value or a constant value as suggested by the cited literature) across the responses measured.

Summary of Hypotheses

In sum, we tested two hypotheses. First, the similarity and liking manipulations should have additive effects on trust, respect, and attraction (Hypothesis 2). Second, both trust and respect should mediate the similarity and liking effects equally at the Trust → Respect order (Hypothesis 1).

METHOD

Design

For testing our hypotheses, there were two designs. In the first, we manipulated attitude dissimilarity *versus* similarity between the participant and the partner. In the second, we manipulated both attitude similarity and partner's liking for the participant. Thus, the overall design was a 3 (partner's liking: low *vs.* control condition of no information (i.e., attitude similarity only of the first design) *vs.* high) × 2 (attitudes: dissimilar *vs.* similar) between-participants factorial. For the four cells of the second design, we also counterbalanced the order of information presentation (attitudes-partner's liking *vs.* partner's liking-attitudes) over half of the participants.

Participants

Participants were 150 female and 26 male undergraduate Chinese students from the National University of Singapore (M_{age} = 20.18, *SD* = 1.45, age range = 18–26 years). Of them, 80 were randomly assigned to the two conditions of no-information about the partner's liking (*n*s = 40 per cell in the first design) and 96 to the eight cells formed by the two levels of order of information presentation, the partner's liking, and attitudes (*n*s = 12 per cell). Given the *n* of 24 for each of the four cells formed by the factors of the partner's liking and attitude similarity (i.e., the main effects of either attitude similarity or the partner's liking from the second design would be based on the *n* of 48), we used 40 participants in the two conditions of no-partner's liking (i.e., attitude similarity information only). Consequently, there was seeming closeness with regard to the sample size of the six means displayed in Fig. 1. Such methodological caution came from Singh, Yeoh, Lim, and Lim (1997) who advocated that the sample size should be larger in a single-category design than in the crossed-category design.

Manipulations

Attitude similarity. We operationalized attitudes as responses to a 12-item attitude survey. Participants had initially responded to each such issue by checking one of six statements, excluding the neutral statement (e.g., *very much in favor of, in favor of, mildly in favor of, mildly against, against*, or *very much against the position*; Byrne, 1971). We used only those issues for which the level of support *vs.* opposition was nearly equal in the participant population (e.g., *interracial dating, premarital sexual relations, organ sale, ranking of school, etc.*).

Based on the responses of each participant to the initial survey, we simulated a participant-specific bogus attitude survey. Consistent with Byrne's (1971) method, similar attitudes were just one point away and on the same side of the participant's own response, but dissimilar attitudes were three points away and on the opposite side of the participant's response.

Partner's liking. The partner's liking for the participant was manipulated via a bogus attraction scale which contained seemingly 10 *attraction* items. We told the participants that their partner had earlier seen their respective attitude surveys and judged them on a Partner Opinion Questionnaire (POQ). Ten items of that POQ, which had 7-point scales ranging from 1 (*lowest*) to 7 (*highest*), would indicate how attracted the partner was toward them. In the condition of the partner's *low liking*, the four behavioral attraction items had ratings at 1 but the six filler items had ratings at 2 or 3 randomly. In the condition of the partner's *high liking*, in contrast, the four behavioral attraction items had ratings at 7 but the six filler items had ratings at 5 or 6 randomly. To enhance credibility of the manipulations, two of the six filler items were stated in negative.

Response Measures

We used the POQ to measure trust in, respect for, and attraction toward the partner (Singh et al., 2015). The first 20 items of the POQ consisted of four trust (*My partner would look out for my interests; ... act benevolently towards me; make me feel secure;* and *I would find this partner to be dependable*) and four respect (*My future interaction partner will probably be successful in life*; *... would achieve all of his or her goals*; *... is probably good at everything that s/he does*; and *... would make a good leade*r) items presented randomly among 12 filler ones. The succeeding 10 items included four behavioral attraction items (*I would like to meet my partner; ... get to know this person better; ... be with my partner; and ... look forward to working with my partner*) and six filler items. These measures had previously been found to be psychometrically suitable (e.g., Singh et al., 2015).

Procedure

We collected data in two sessions. In the first session, students participated in a mass attitude survey. Those who signed up for the study returned for the second session scheduled one week later in groups of 18 to 20. The announcement for the study had informed that participants would be interacting with another same age and sex partner in a problem-solving task. Before the interaction, however, an opinion formation task would be completed.

In the second session, each participant received a specifically tailored experimental booklet comprising of a bogus survey manipulating attitude similarity between the participant and the partner, a bogus attraction scale manipulating the partner's liking for the participant, and a blank POQ. The orders in which information about attitude similarity and the partner's liking were presented in the experimental booklets were counterbalanced over half of the 96 participants. The basis for forming opinion of the partner by the participants in the control conditions of no-partner's liking information was just the simulated attitude survey.

Participants examined the information presented in the booklet, formed an opinion of the partner for 1 min, and then responded to the POQ items. After collecting the completed booklets, the investigator informed the participants that there was no interaction session scheduled. She fully debriefed them and justified the manipulations for testing of causal hypotheses before terminating the session.

Results

Construct Distinction

To reconfirm that the trust, respect, and attraction responses were empirically distinct (Singh et al. 2015), we first performed a three-factor confirmatory factor analysis (CFA) of the 12 responses in AMOS with correlations among them. In an alternative CFA, we specified the 12 responses as representing a unidimensional evaluation. The three-factor measurement model yielded a much better fit to the data: $\chi^2(51) = 125.49$, $p = .001$, non-normed fit index/Tucker-Lewis index (NNFI/TLI) = .93, incremental fit index (IFI) = .94, root mean square error of approximation (RMSEA) = .09, standardized root mean residual (SRMR) = .06, than did the alternative unidimensional model: $\chi^2(54) = 278.67$, $p < .001$, NNFI/TLI = .79, IFI = .82, RMSEA = .15, SRMR = .08[$\chi^2_{\Delta}(3) = 153.18$, $p < .001$. There was no overlap between 90% confidence interval (CI) for the first RMSEA of .09 [0.07, .11] and that of the second RMSEA of .15 [0.14, .17]. Thus, we accepted trust, respect, and attraction as empirically distinct constructs.

The Cronbach alphas of the trust, respect, and attraction measures were .78, .81, and .92, respectively. We averaged the four relevant responses to form each measure. The scores ranged uniformly from 1 (*lowest*) to 7 (*highest*). The correlations among the three measures ranged from .62 to .66, *p*s < .01, further indicating that they were correlated yet distinct.

Initial Analyses

In a 2 (order of information presentation) × 2 (partner's liking: low *vs.* high) × 2 (attitudes: dissimilar *vs.* similar) between-participants analysis of variance (ANOVA) of the data from the second design, there was no moderation of the effect of the partner's liking or attitude similarity on any of the three responses by the order of information presentation. There was no interaction between the partner's liking and attitude similarity either, supporting the additive effects of Hypothesis 2. Thus, we dropped the factor of

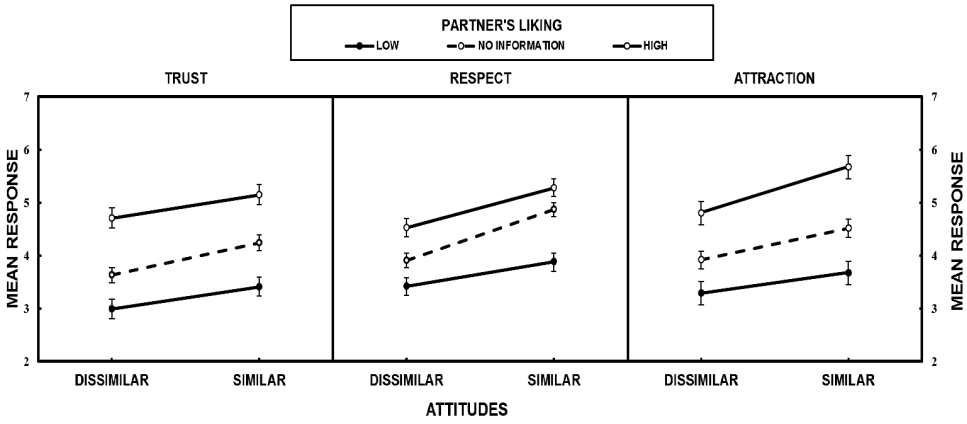


Fig. 1. Mean responses of trust, respect, and attraction as a function of partner's liking for the participant (line parameter) and dissimilar versus similar attitudes (listed on the horizontal axis). The pattern of parallelism implies that the partner's liking for the participant added, but disliking subtracted, a constant effect to attraction from attitude similarity. Error bars represent ±1 *SEM*.

order of information presentation from the design and then analyzed the data of the overall design by 3 (partner's liking: low, no information about partner's liking, and high) × 2 (attitudes: similar and dissimilar) ANOVAs. Such ANOVAs were directly useful in diagnosing how the missing liking information was inferred from the given attitude similarity information alone. Given that the method of testing Hypothesis 1 depended upon the pattern in the Liking × Similarity effects on the three responses, we report results from test of Hypothesis 2 before those from test of Hypothesis 1.

Hypothesis 2

We present the joint effects of the partner's liking (represented by three lines) and attitude similarity between the partner and the participant (listed on the horizontal axis) in Fig. 1. The six corresponding means of the trust, respect, and attraction responses are displayed in the left, center, and right graphs, respectively. Whereas the two solid lines represent the levels of liking expressed by the partner, the dashed line represents the control condition in which there was attitude similarity but no information about the partner's liking. Thus, the separation between lines indicates the liking effect; the slope of the line, by contrast, indicates the similarity effect. All three graphs have the same pattern of parallelism as if a constant-weight averaging rule (Anderson, 1981; Kaplan & Anderson, 1973) with an imputed ambivalence of the partner toward the participants were operative (Byrne & Ervin, 1969).

Results from ANOVA further confirmed the preceding interpretations. The interaction effect was absent in all three responses, Fs(2, 170) < 1.40, ps > .25, η^2_ps < .02, powers < .30. By contrast, the main effect of the partner's liking, Fs(2, 170) > 28.25, ps < .001, η^2_ps > .25, powers = 1, were much stronger than that of attitude similarity, Fs(1, 170) > 12.78, ps < .001, η^2_ps > .07, powers > .95. Pairwise comparisons between three means of the

partner's liking by Tukey's *HSD* further disclosed that they differed significantly from each other. That is, the bottom solid line was significantly lower than the center dashed line which was significantly lower than the top solid line. Collectively, these results show that attitude similarity influenced attraction independent of the partner's liking, and that inferred value to the missing liking was seemingly between the high and low levels of the manipulated liking. Accordingly, we regarded support for Hypothesis 2 as unambiguous.

Mediation Analyses

We coded the low, no-information, and high levels of the partner's liking as –1, 0, and 1, respectively, and dissimilar and similar attitudes as 0 and 1, respectively. For testing mediation by PROCESS (Hayes, 2013)[4] in SPSS, we then specified attraction as the DV, trust and respect as the MVs, one factor as the IV, and the other factor as the covariate. Further, we specified 5000 bootstrap re-samples for estimating the indirect effects (IEs) of the IV via the two MVs and for testing the significance of difference between the IEs via them. We accepted an IE via an MV or the difference between two IEs as statistically significant only if its bias-corrected 95% CI excluded zero.

Parallel mediation model. The output from PROCESS Model 4, that specifies independent operation of each MV (e.g., Singh, Ng, et al., 2008; Singh, Yeo, et al., 2007), yielded the IEs of the attitude similarity on the DV via trust ($IE_1 = a_{11}b_1$) and respect ($IE_1 = a_{12}b_2$) and of the partner's liking on the DV via trust ($IE_1 = a_{21}b_1$) and respect ($IE_2 = a_{22}b_2$). Note that a_{11} and a_{12} represent the effects of the IV of attitude similarity on the first MV of trust and the second MV of respect, respectively; a_{21} and a_{22} represent the effects of the IV of the partner's liking on the first MV of trust and the second MV of respect, respectively; and b_1 and b_2 represent the respective effects of the MVs of trust and respect when they predicted the DV along with the IV considered.

We display the results from the aforementioned two parallel mediation analyses in Fig. 2a. In the top part of Table 1, we report IEs of similarity effects and of liking effects via the two MVs in the left and right sides, respectively. As can be seen, the similarity effect on attraction was mediated more strongly by respect than trust. The difference of 0.27 between the two IEs was significantly greater than zero: 95% CI: 0.03, 0.56. In contrast, the liking effect on attraction was mediated equally by trust and respect. The IE difference of 0.10 between the two IEs was not greater than zero: 95% CI: –0.38, 0.19. Apparently, respect can at times be more effective than trust or as effective as trust in attraction.

Sequential mediation models. Given our prediction of sequential mediation model for trust and respect (Singh et al., 2015), we performed two such analyses of the same data by PROCESS Model 6 in which dependency of MV_2 on MV_1 (i.e., $MV_1 \rightarrow MV_2 = d_{21}$) is further specified (Hayes, 2013). In the first set of two analyses, we designated the respective trust and respect as MVs distal and proximal to attraction originating from attitude similarity

[4] The structural equation modeling (SEM) provides fit indices for a model tested only when some causal paths are unspecified (Singh et al., 2014). When all paths are specified in the models as in the tested PROCESS Models 4 and 6 (Singh et al., 2015), the fit indices from SEM are erroneously perfect. By contrast, PROCESS Models specify all causal paths to estimate all possible IEs and hence are gaining popularity in the literature.

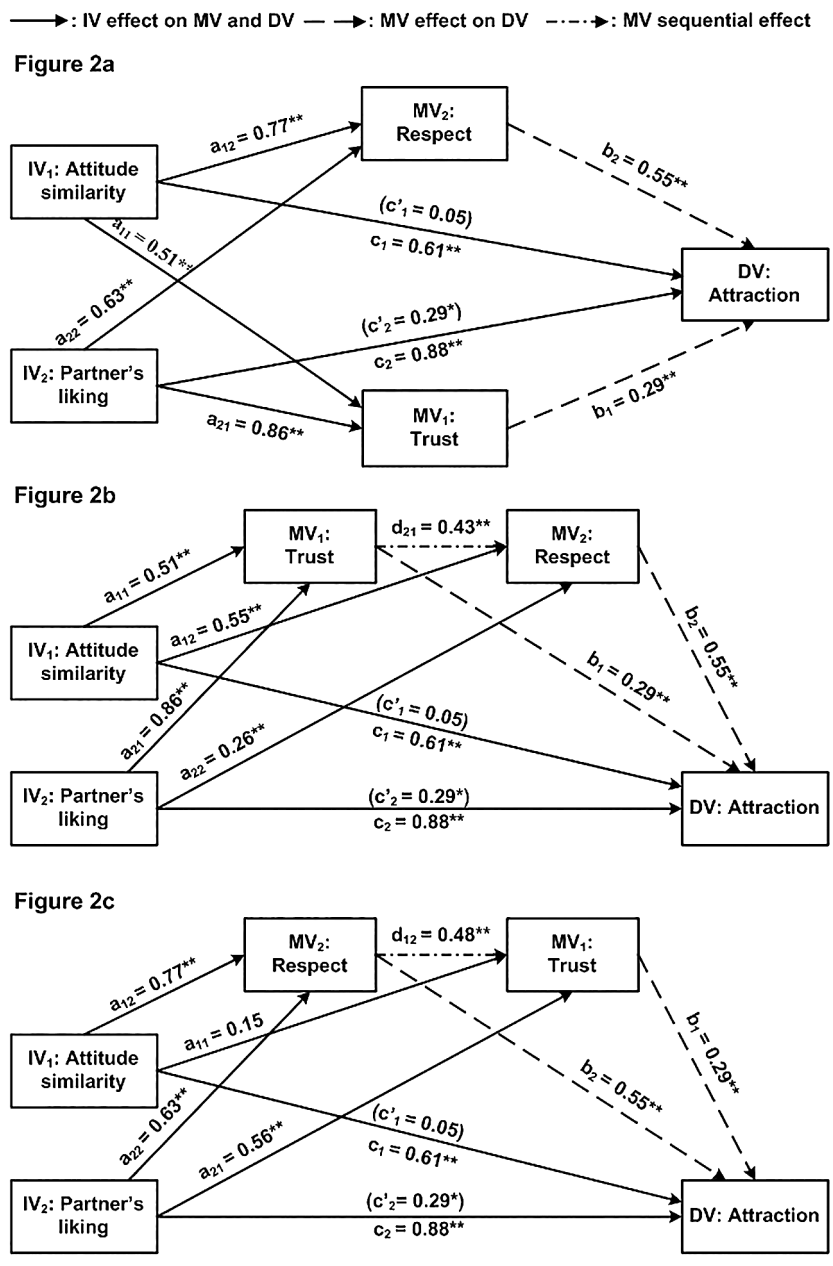


Fig. 2. The unstandardized coefficients from separate multiple-mediation analyses of attitude similarity effects and the partner's liking effects on attraction by trust and respect. Fig. 2a, 2b, and 2c have results from the parallel, Sequential Model 1, and Sequential Model 2 analyses, respectively. In each diagram, the coefficients came from two separate analyses: The first used attitude similarity as the IV and the partner's liking as the covariate; the second did the reverse. Thus, mediation of the effect of one IV on attraction was tested by trust and respect while holding the effect of the other IV constant.

Table 1. Indirect effects (IEs) of attitude similarity and the partner's liking via trust and respect on attraction along with 95% CI and mediation effect size (MES) from the mediation models tested

Models	Mediators	Attitude similarity			Partner's liking		
		IE	95% CI	MES	IE	95% CI	MES
Parallel mediation model							
1	Trust	0.15[b]	[0.04,0.31]	.25	0.25[a]	[0.07,0.44]	.28
	Respect	0.42[a]	[0.25,0.67]	.69	0.35[a]	[0.20,0.52]	.40
Sequential mediation models							
1	Trust	0.15[ab]	[0.03,0.32]	.25	0.25[a]	[0.08,0.46]	.28
	Trust → Respect	0.12[b]	[0.05,0.24]	.20	0.20[a]	[0.11,0.34]	.23
	Respect	0.30[a]	[0.15,0.50]	.49	0.14[a]	[0.03,0.30]	.16
2	Respect	0.42[a]	[0.24,0.66]	.69	0.35[a]	[0.21,0.52]	.40
	Respect → Trust	0.11[b]	[0.03,0.22]	.18	0.09[b]	[0.03,0.17]	.10
	Trust	0.04[b]	[-0.02,0.16]	.07	0.16[ab]	[0.13,0.42]	.18

Note. 95% CI = 95% CI for the IE; MES = MES of the IE. The IEs with different superscripts differ significantly at $p \leq .05$. In the two sequential mediation models, the first and last IEs are of the respective preceding and the succeeding MVs themselves; the center one is the sequential effect of the preceding MV on mediation by the succeeding MV.

and the partner's liking. Thus, these sequential mediation analyses partitioned the IE of attitude similarity via respect, for example, into (i) the sequential IE coming from the preceding MV of trust (IE via $MV_1 \rightarrow MV_2 = a_{11}d_{21}b_2$) and (ii) the IE stemming from the MV of respect *per se* ($a_{12}b_2$). To solidify that only the hypothesized causal order is acceptable, we placed respect before trust in two alternative sequential analyses. Consequently, the IEs of each mediator (controlling for influences of the other mediator) and of the sequential dependency of the succeeding MV on the preceding one were estimated.

Hypothesis 1

We present results from the hypothesized Sequential Model 1 (Trust → Respect) in Fig. 2b and those from the alternative Sequential Model 2 (Respect → Trust) in Fig. 2c. The IEs of attitude similarity on attraction via trust, Trust → Respect, and respect are listed on the left side and those of the partner's attraction are listed on the right side of Table 1. The IEs from Sequential Model 2 are also reported in the same ways in Table 1.

Three trends stand out from the coefficients displayed in Fig. 2b and 2c and the IEs reported in Table 1. First, the dependency of the succeeding MV on the preceding one is statistically significant in both models. Thus, the MVs did influence each other, questioning the plausibility of the parallel mediation model tested earlier. Second, and as hypothesized, both trust and respect emerged as equally important MVs of the similarity: Difference of

–0.15, 95% CI: –0.41, 0.10, and liking: Difference of –0.11, 95% CI: –0.16, 0.39, effects in Sequential Model 1. Further, the IEs of attitude similarity via trust and Trust → Respect were equal: Difference of 0.03, 95% CI: –0.12, 0.18; so were the IEs of liking via trust and Trust → Respect: Difference of 0.05, 95% CI: –0.20, 0.27. Finally, in Sequential Model 2, where respect preceded trust, respect was more important than trust: Difference of 0.38, 95% CI: 0.16, 0.64, and Respect → Trust: Difference of 0.31, 95% CI: 0.11, 0.57, as a MV the similarity effect. Most surprisingly, the IE of the similarity effect via trust was not greater than zero. Whereas both respect and trust mediated the liking effect equally: Difference of 0.19, 95% CI: –0.06, 0.43, the IEs via respect and trust were greater than that via Respect → Trust. The difference between IEs via respect and Respect → Trust was 0.26, 95% CI: 0.10, 0.46, and that between IEs via trust and Respect → Trust was 0.07, 95% CI: 0.01, 0.22. Collectively, these results indicate the causal flows of the IV effects from trust to respect and the equality between them as we had hypothesized.

Discussion

Findings support the two-dimensional trust-respect model of attraction in three important ways. First, both trust and respect do play causal roles in interpersonal attraction as the two-dimensional cognitive model posits (Montoya & Horton, 2014). Second, trust and respect are evoked by attitude similarity and by the partner's liking for the participant as if they were similarities in issues varying in importance (Byrne & Rhamey, 1965) or different pieces of information about quality of the partner (Insko et al., 1973; Montoya & Horton, 2004). Finally, and the most novel, the more plausible causal order appears to be from trust to respect rather than parallel operation as in early multiple-mediation studies (Singh, Ng, et al., 2008; Singh, Yeo, et al., 2007) or from respect to trust as in recent studies of attitude similarity effects (Singh et al., 2015). By manipulating similarity and liking together, therefore, we have succeeded in showing that the two MVs posited by the cognitive model influence attraction equally at the hypothesized trust to respect order.

Our contribution lies in not only specifying the foregoing causal order of the MVs but also falsifying the alternative respect to trust order of causation. When we reversed the causal flow in Sequential Model 2, trust failed to mediate attitude similarity effects. This evidence against the causal role of trust is at odds with the literature showing centrality of trust in the contexts of interdependent groups in general (Cottrell, Neuberg, & Li, 2007) and interpersonal attraction from attitude similarity in particular (Singh et al., 2015; Singh, Tay, & Sankaran, 2016). Given the convergence between Fiske et al.'s (2007) speculation and the present evidence for the trust to respect order, we conclude that the similarity and liking effects on attraction are mediated equally by the two posited cognitive dimensions (Montoya & Horton, 2014).

The additive effects of liking and similarity on the three measured responses offer a new perspective on how missing liking information is possibly inferred from the given attitude similarity information in expressing attraction. Recall that we crossed the partner's liking for the participant with attitude similarity between them and also obtained responses

from attitude similarity information presented alone. Given that the two manipulations had additive effects in 2 × 2 ANOVAs, we included responses from the conditions of dissimilar *versus* similar attitudes in subsequent 3 × 2 ANOVAs.[5] The basis of our inferences about the missing liking information was the slope of the attraction-line from attitude similarity alone. As the attraction-line formed part of the same pattern of parallelism in the Liking × Similarity effects of Fig. 1, we regarded inferred value to the missing liking information as moderate but constant across dissimilar and similar attitudes (Byrne & Ervin, 1969). Recall that one group of participants in Insko et al.'s (1973) Experiment 2 had also imputed such a neutral value to the missing liking information.

The pattern of parallelism in Fig. 1 can also be explained by an alternative integration rule of adding (Singh, Yeoh, et al., 1997) instead of averaging with constant inferences about the missing liking information. The adding rule does not constrain the relative weights to sum to 1 (Anderson, 1981), and thus it predicts uniform effects of information presented alone and that presented with another piece of information. In the present case, therefore, it is possible that high liking simply added to, but low liking subtracted from, the attraction response already engendered by attitude similarity. That is, an adding rule without any imputation about missing liking information could also account for the pattern of parallelism in the trust, respect, and attraction responses equally well.

Both the adding and averaging rules are basic cognitive processes (Anderson, 1981, 2013). Nevertheless, concluding for adding and against averaging rule cannot account for other attraction phenomena which were the grounds of claiming information integration theory (Kaplan & Anderson, 1973) as a better approach to interpersonal attraction than reinforcement theory (Byrne, 1971). Worse still, denying inferences about missing liking or attitude information (Chen & Kenrick, 2002; Singh & Tan, 1992; Tan & Singh, 1995) would be at odds with the extant evidence and with the current theorizing that people do search for intent and ability from the information at hand (Fiske et al., 2007), and that they correspondingly develop trust and respect before expressing attraction toward the partner (Montoya & Horton, 2014).

Our mediation findings improve upon the existing understanding of the foundations of interpersonal attitudes. Heider (1958) distinguished liking for a person from admiring him or her, stating that the former belongs to the heart but the latter to the head. Consistent with this view, the effect of communion on liking was mediated by trust but that of agency on respect by inferred status potential of the target (Wojciszke et al., 2009). While these studies showed that liking and respect are dimensions of interpersonal attitudes, they did not clarify how liking and respect cause interpersonal attitude. By treating interpersonal attraction as a proxy of interpersonal attitude, we can now attribute the reciprocal effects between liking and respect (Wojciszke et al., 2009) to trust originating from benevolence or other-profitability and respect from agency or self-profitability (Singh et al., 2009) and then jointly producing attraction. Put simply, trust and respect are the two pillars of

[5] Previous investigators (Byrne & Ervin, 1969; Byrne & Rhamey, 1965; Insko et al., 1973) analyzed the complete set of data as in our second set of analyses. Thus, it was unclear whether the original Liking × Similarity effect on attraction was additive or non-additive. Clore and Baldridge (1970) found evidence for the additive effects in 2 × 2 (Evaluations × Attitude similarity) ANOVA but they did not perform 3 × 2 ANOVAs.

behavioral attraction between two persons.

From the findings of this research, what might be said about Model 1 of Insko et al. (1973)? Recall that Model 1 was essentially a single-mediator model in which attitude similarity influenced attraction via inferred attraction (Aronson & Worchel, 1966; Condon & Crano, 1988). Had Model 1 been correct, information about the partner's liking would have completely eliminated attitude similarity effects on attraction (Spencer, Zanna, & Fong, 2005). Because the similarity effect on attraction was nullified in neither this research nor several previous studies, testing mediation experimentally appears to be of limited value particularly when there are multiple mechanisms underlying the IV-DV link (Bullock, Green, & Ha, 2010). Given the evidence for mediation of the similarity effect on attraction by inferred attraction (e.g., Singh et al., 2015) and for trust and respect as equally potent MVs as the two-dimensional model (Montoya & Horton, 2014) prescribes, we believe that attraction from the similarity and liking manipulations might best be represented as a weighted average (Kaplan & Anderson, 1973) of the values of given and/or imputed values. Further, experimental manipulation of the partner's liking does not moderate similarity effects on attraction perhaps because inferred attraction is a mediator distal rather than proximal to attraction (Singh et al., 2016).

What the two-dimensional model of interpersonal attraction advises people to be attractive to others nowadays (Montoya & Horton, 2014) reminds us of the source credibility model of attitude change (e.g., Kelman & Hovland, 1953). In an old review of the literature, Simons, Berkowitz, and Moyer (1970) concluded that the source of the message should be not only *expert* but also *trustworthy* for producing attitude change. In fact, they suggested "... the necessity of joining the heretofore separate efforts of 'social attraction' and 'credibility' researchers" (p. 13) in investigating the roles of trust and respect in credibility of or attraction toward the models used in commercial advertisements. Although our response to their suggestion is admittedly late, we are pleased to report that what draws strangers together might be equally effective in their acceptance or rejection of models in ads, leaders in groups, and products and services in the market. This potential of the two-dimensional cognitive model of evaluative responses deserves further attention and investigation, using information that may trigger both "hot" and "cold" cognitions. After all, the two-dimensional model may be falsified only when the joint effects of positive affect and inferred attraction would also succumb to a similar sequential mediation model illustrated in present research.

Two limitations of our findings also deserve mention. The first pertains to the presence of a considerably larger number of women than men among research participants. This limitation is more because of the nature of the participant population studied by psychologists than our study *per se*. There are always more women than men in the population of undergraduate psychology students across the globe (Chen & Kenrick, 2002; Montoya & Horton, 2004) that makes inequality between sex groups is realistic, not a limitation. More important, sex of the adult participants did not moderate attitude similarity effects on attraction in a previous study in the same population (Singh, Ng, et al., 2008, Experiment 2). Thus, the reported evidence of sequential mediation might hold with men as well. Nonetheless, we advocate use of an equal number of men and women in future

research in similarity and liking effects on attraction.

Second, how generalizable are the present findings from Chinese students in Singapore to other student populations across the globe? This question attains importance particularly because similarity effects sometimes seem to be stronger among North Americans than East Asians (e.g., Heine, Foster, & Spina, 2009; Schug, Yuki, Horikawa, & Takemura, 2009). While the issue of external validity of results is too important to ignore, our experiment was directed at conceptual clarity vis-à-vis causal flows between trust and respect instead of external generalizability of results (Wilson, Aronson, & Carlsmith, 2010). It deserves emphasis, nevertheless, that our additive effects of attitude similarity and partner's liking on the three responses measured do converge with those reported from studies of North Americans (Byrne & Ervin, 1969; Byrne & Griffitt, 1966; Clore & Baldridge,1970; Singh, 1975). Moreover, the similarity-attraction and dissimilarity-repulsion effects were of similar levels in both North Americans and Japanese in the bogus stranger paradigm that we employed (Gudykunst & Nishida, 1984). Accordingly, we expect our finding of sequential mediation to be as generalizable across the globe as is the additive effect. We recommend new cross-cultural studies for further checks on the robustness of findings reported.

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