Misattribution Under Fear-Producing Circumstances: Four Failures to Replicate

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Abstract. Four studies were done in an attempt to test the misattribution explanation of earlier findings showing a connection between aversive arousal and attraction. All four studies indicated that subjects do not attribute arousal to a female confederate when a clear and salient aversive stimulus is present. Instead, subjects correctly assigned causality to the experimental situation. All four studies also failed to reproduce the original attraction finding, i.e., aversive circumstances were not found to enhance attraction for the confederate.

Several years ago, Walster and Berscheid (1971) suggested the interesting possibility that Schachter and Singer's (1962) two-component theory of emotion might be used to explain the phenomenon of increased romantic attraction under aversive conditions. A similar notion was advanced by Dutton and Aron (1974) who also suggested the possibility that aversive arousal might be relabelled as attraction even when the actual source of the arousal was salient. The misattribution-love idea has received wide popularity, as judged by frequent citations in undergraduate social psychology texts (e.g. Baron and Byrne, 1977; Harrison, 1975; Middlebrook, 1974), standard references on attraction (Huston, 1974; Murstein, 1971; Berscheid & Walster, 1978), recent works on human sexuality (Byrne, 1977; Byrne & Byrne, 1977) and even a number of freshman introductory psychology texts (e.g. CRM, 1975; McNeil & Rubin, 1977).

Despite the wide popularity of the theory, there is little direct evidence to support it, and, on careful examination, even that evidence is subject to alternative explanation via a negative reinforcement model (Kenrick & Cialdini, 1977). According to these authors, the most critical problem with the studies most frequently cited in support of the misattribution theory of attraction is that subjects in these studies were unlikely to have made arousal misattributions, given the high salience of the actual arousal-inducing stimuli.

The present program of research was intended to test directly the misattribution explanation of findings within the fear-arousal paradigm used by earlier researchers (Brehm et al., Note 2; Dutton & Aron, 1974). It was expected that subjects would not increase attributions of arousal to a confederate under highly aversive circumstances, but would instead correctly assign causality to the experimental situation. It was also expected that, consistent with the negative reinforcement model, increases in attraction within this paradigm would be accompanied by reductions in anxiety and increases in attributions of relaxation to the confederate.

EXPERIMENT 1. Each subject (male introductory psychology student) arrived singly and was met by a male experimenter who explained that the experiment dealt with the way first impressions are affected by environmental conditions. He further explained "We're also interested in how a person's inner feelings are related to the impressions he forms of another, so we'll be hooking you up to some physiological recording equipment."

Following this, the subject was hooked up to some hand surface electrodes and was then told to relax while the experimenter ostensibly

went to adjust the recording equipment. After obtaining a ten minute baseline on the physiological measures, the experimenter returned and verbally administered the stress manipulation. Subjects were led to expect either "painful electrical shock" (high stress) or "mildly distracting tones" (low stress). After this, subjects were told to sit quietly for a few minutes while pre-test physiological data was ostensibly to be recorded. They were then told "one of the departmental work study people may be coming in to have you fill out an additional data sheet the psychology department is getting on all experimental subjects." After a three minute period, an attractive confederate (either male or female) entered the room, informed the subject that "The psychology department needs to get some information from experimental subjects" and proceeded to ask the subject a series of rather mundane questions concerning the experimental credit requirement. The confederate had no information about the fear condition of any subject. A control condition was also run in which subjects were not exposed to a confederate.

After five minutes, the experimenter returned to the room and asked the confederate if she was done since he needed to continue with the experiment. The confederate then left the room, and the experimenter explained that it was necessary that the subject fill out several "pre-measures, before we actually begin."

Subjects then gave their "first impression" of the confederate on several evaluatively toned bi-polar adjectives and responded to an item which asked "how much do you like this person?". The subject was told that this was the rating form he would later use to rate the "other subject," and that "before actually exposing you to the shock (tones) we need to get a general idea of your rating style, so we've been having people fill it out with reference to the work assistant you just met." In addition, Spielberger's (1966) state anxiety inventory was administered as a check on the stress manipulation.

Attribution measures. Subjects were asked to assign causality to their "present feelings of excitement" and were given three response categories (labelled "the person you just met," "the experimental situation," and "other factors"). A similar item asked subjects to assign causality for their "present feelings of relaxation." (These items were given last in all 4 experiments.)

EXPERIMENT 2. As in Experiment 1, undergraduate male subjects arrived singly and were hooked up to physiological recording equipment. In order to approximate more closely the methodology of the Dutton and Aron (1974) laboratory experiment, the confederate was presented as a fellow subject who arrived several minutes later and was herself/himself hooked up to dummy electrodes. The stress manipulation was then given with both subject and confederate present (placing both of them in the same stress condition, either high or low). Following this, both the subject and confederate were asked to fill out the "pre-measures." Following Dutton and Aron (1974), attraction ratings also included two items asking subjects to rate their "desire to date" and their "desire to kiss" the female (but not the male) confederate.

EXPERIMENT 3. Experiment 3 was an attempt at exact methodological replication of the Dutton and Aron (1974) laboratory study. No physiological measures were used and subjects were alone when they completed the dependent measures. All other details corresponded exactly to the reported procedures of the Dutton and Aron (1974) study (i.e. apparatus, presence of articles on shock, verbal instructions, physical attractiveness and position of confederate, coin flip to determine condition, order of dependent variables, etc.) except that a no-shock control group was also included in addition to the high and low shock groups. Subjects in the control condition expected to hear a series of "mildly distracting tones." No

male confederates were included in this experiment.

EXPERIMENT 4. The procedure for Experiment 4 was identical to that for Experiment 3, with two minor exceptions. The "noise" control group was deleted and the subject was left alone with the confederate for a brief period (45 seconds) while the experimenter ostensibly went to get the "pre-measures." At that point the confederate acted in either a reinforcing or a neutral style. In the reinforcing condition, she made eye contact with the subject and stated that "This kind of experiment makes me a little nervous." After the subject's response, she stated her doubts that a very high shock level would be used.

In the neutral condition (as in the earlier studies) the confederate did not talk or make eye contact with the subject. The Speilberger state anxiety measure was not included in this study since the validity of the fear manipulations had been well established at this point.

RESULTS. For simplicity of reporting, the central analyses are reported as a 2 (fear levels: high vs. low) x 4 (replications) factorial design. Only conditions in which a female confederate was present are included. For those dependent measures which were not used across all studies results are reported accordingly.

Manipulation check: The state anxiety measure, used in Experiments 1, 2, and 3, showed the predicted main effect of the fear manipulations, F (1,115) = 18.78, $p < .001$. Physiological measures indicated some additional support for the effectiveness of the manipulation, but did not show differential arousal in the confederate vs. alone conditions (Kenrick, note 3). Likewise, no effects were found when subjects' anxiety scores for the alone vs. confederate condition were compared.

Table 1: Main dependent variables: Experiments 1 through 4

Experiment	1		2		3		4	
dependent variable:	High Fear	Low Fear	High Fear	Low Fear	High Fear	Low Fear	High Fear	Low Fear
attributions of excitement:								
to female	2.0	3.4	3.1	3.2	2.0	2.3	2.4	2.2
to experiment	6.1	5.8	5.5	4.1	3.3	3.0	3.9	3.7
attributions of relaxation:								
to female	4.9	4.8	4.1	2.5	1.9	2.3	2.7	2.7
to experiment	3.5	4.0	2.4	3.4	1.8	1.9	2.2	2.0
"relaxing"	7.1	7.0	6.0	5.5	---	---	5.0	4.8
liking	6.7	6.7	5.9	5.6	3.2	3.5	4.9	4.6
desire to date	---	---	5.0	5.0	3.4	3.2	5.0	4.7
desire to kiss	---	---	5.0	5.1	2.9	3.3	---	---
n per cell	16	16	21	22	16	31	37	38

Note: Response scales were 5 points in Experiment 3, 7 points in Experiment 4, and 9 point scales in Experiments 1 and 2.

Attribution measures: As seen in Table 1, subjects increased attributions of excitement to the experiment in high fear, F (1,189) = 4.64, $p < .03$, but failed to show a similar effect for attributions of excitement to the confederate, F (1,189) < 1, $p < .34$. An analysis of the difference scores (excitement attributed to the situation minus excitement attributed to the confederate) further supports the contention that subjects made accurate attributions when a clear and salient cause for

their arousal (painful electric shock) was present. The difference was significantly greater in the high fear conditions indicating greater attribution of arousal to the situation than to the confederate, F (1,189) = 9.07, $p < .005$. The overall analysis for the fear main effect did not reach significance for either of the attribution of relaxation items, F (1,188) = 1.37, $p < .24$ for attributions to the experiment, and F (1,188) = 1.80, $p < .18$, for attributions to the confederate. A similar item was used in Experiments 1, 2, and 4 (the confederate was rated on a bi-polar scale from "not at all relaxing" to "very relaxing") and this item also failed to show a significant effect of the fear manipulation, F (1,144) = 1.25, $p < .27$.

Attraction measures: The "liking" item failed to show a significant main effect of fear level, as did the "desire to date" and "desire to kiss" items, all Fs < 1. Likewise, none of the subsidiary, bi-polar evaluative items showed a significant effect of fear in any of the experiments. Results for the male confederate conditions (included only in Experiments 1 and 2) have not been included in the overall analysis presented here, but were essentially identical, indicating no effects of fear on any of the attraction measures.

DISCUSSION. We began this program of research with the assumption that high fear would lead to heightened heterosexual attraction within this paradigm. Our intention, then, was to "replicate and extend" what we considered to be a well-established finding. Experiment 1 was an attempt at conceptual replication. When we failed to obtain the fear-attraction finding at first, we modified our design to approximate more closely the Dutton and Aron (1974) laboratory procedure. Some salient differences remained in Experiment 2, however, and when we again failed to replicate, we reasoned that some such feature of our design was at fault. We then designed Experiment 3 as an exact replication, and carefully attempted to copy the Dutton and Aron (1974) design in every detail. Again, however, we failed to reproduce the effect in question. This occurred despite the clear evidence of the effectiveness of the manipulations. The dependent measures of attraction, although so insensitive to fear manipulations, were sensitive to small differences in the physical attractiveness of the confederates (Kenrick, Note 3). Experiment 4 also contained a near exact replication within the non-reinforcing confederate condition and again demonstrated no effect of fear arousal on attraction.[2]

The results of this series of studies lend support to the position that arousal produced by unambiguous threatening stimuli is unlikely to be mislabelled as attraction. Instead, individuals tend to view the locus of their arousal under such conditions as residing more clearly in the situation. As such, these results are in line with earlier work on arousal misattribution (Calvert-Boyanowsky & Leventhal, 1975; Cantor, Zillman & Bryant, 1975; Schachter & Singer, 1962) but oppose a misattribution interpretation of results such as those obtained by Dutton and Aron (1974). It should be noted that although the Dutton and Aron (1974) results have been widely accepted as supportive of the misattribution view of romantic attraction, Walster and Berscheid (1971) based their formulation on the original Schachter and Singer (1962) model, which would not in fact expect misattribution to occur under such circumstances. Dutton and Aron (1974) also noted that in order to explain such results in misattribution terms, it is necessary to alter the source ambiguity assumption of the original model.

If misattributed arousal can enhance romantic attraction, it seems most likely to do so where arousal is of ambiguous origin, and not where highly salient aversive stimuli are present. While it should theoretically be possible to produce such misattribution in a highly controlled laboratory environment, it remains to be shown whether such "mistakes of attribution" can explain romantic attraction outside the laboratory to any large extent (Kenrick & Cialdini, 1977). As yet, we still do not have any direct evidence demonstrating such a phenomenon. What the present results

suggest is that such a process seems questionable in the laboratory studies most frequently cited in support of the model.

With regard to the negative-reinforcement position our results are certainly less than definitive. Unlike Dutton and Aron (1974), we do not find evidence that the presence of the confederate was anxiety reducing for the subject. Where attraction differences were found there was evidence that subjects did find the female to be more attractive when she was reinforcing, i.e., relaxing, (Kenrick, Note 3) although this effect was not enhanced by high fear conditions. Unfortunately the crucial experimental comparison could not be made due to the problems encountered in replicating the Dutton and Aron (1974) finding within this paradigm. If one takes account of the correlations between the Dutton and Aron attraction items ("desire to date" and "desire to kiss") and the attributional items, some relative support is suggested for a reinforcement position. While attributions of excitement account for an average of 34% of the variance in the attraction items under low fear conditions, this figure drops to 19% under high fear. Attributions of relaxation show the opposite pattern, accounting for an average of 9% of the variance in these items under low fear, but 23% in the high fear cells.

Our major point in reporting these data is to suggest that this particular paradigm may be limited in producing an attraction effect. It should be noted that although Brehm et al. (Note 2) found a similar effect in an unpublished study which used a similar paradigm, another study from the same laboratory (Brehm & Aderman, Note 1) failed to replicate the earlier result. Despite the unfavorable score for finding the effect within this paradigm, there is enough other evidence indicating a similar effect (see Kenrick & Johnson, in press, for a review), as well as the abundant data supporting the reinforcement value of others of our species under threatening conditions, that we would not suggest that there is never a connection between fear and attraction. However, mere contact with another person under threatening or anxiety producing circumstances is probably not sufficient to determine attraction. Rather, some additional factors doubtless mediate the effect. Kenrick and Johnson (in press), for instance, found that female subjects showed relatively highest attraction for a fellow subject present while they were exposed to highly aversive noise. In this case, however, naturally occurring subjects were used rather than confederates. There is other evidence to suggest that the fear-attraction link might be mediated by the fact that subjects in fear-arousing situations actually interact in a more mutually reinforcing manner than those in less threatening situations (Morris et al., 1976). Note that results of studies like that performed by Kenrick and Johnson, and several others (reviewed therein) that indicate increases in attraction for same-sexed others under aversive conditions bolster the relative parsimony of the negative reinforcement over the misattribution notion.

As a closing note, we would suggest that, given the theoretical problems with the central studies used to support the misattribution theory of romantic attraction, and the present series of failures even to replicate the controversial findings, social psychologists might well be cautioned to reevaluate their current enthusiasm for publicizing this theory to the lay community.

Reference Notes

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Footnotes

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Portions of this paper were presented at the convention on "Love and Attraction": Swansea, Wales, September, 1977.

[2]An internal analysis of the results of Experiment 4 indicated increased attraction for the reinforcing confederate, but no interaction of confederate style with fear condition. A longer manuscript containing additional details is available from the authors.