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An Odds-Ratio-Based Meta-Analysis of Research on the Door-in-the-Face Influence Strategy

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Previous meta-analytic reviews of research concerning the door-in-the-face (DITF) influence strategy have used the correlation coefficient as the index of effect size, an arguably incorrect choice; the odds ratio provides a much more appropriate effect-size index for the kinds of outcomes studied. Correlations and odds ratios can yield quite different descriptions of experimental results, which makes for uncertainty about previously-reported meta-analytic results. This paper reports a meta-analysis of the DITF research literature using the odds ratio as the effect-size index. The results largely confirm those of the most recent DITF meta-analysis.

■ In the door-in-the-face (DITF) influence strategy, first studied by Cialdini et al. (1975), a relatively large initial request is made of a person, which the person declines. Then a smaller one is made, with the hope that the person's having declined the initial request will make the person more likely to comply with the second (target) request. Experimental studies of the strategy assess DITF success by comparing the target-request compliance rate in the DITF condition against the compliance rate in a control condition in which only the target request is presented.

The DITF strategy has been extensively studied in the years following Cialdini et al.'s (1975) initial discussion. Three meta-analytic reviews of DITF research have been published, two about 15 years ago (Dillard, Hunter, & Burgoon, 1984; Fern, Monroe, & Avila, 1986) and one rather recently (O'Keefe & Hale, 1998). These reviews have identified several important moderators of DITF success, and thus have described the patterns of DITF effects to be accounted for by any successful explanation of the strategy's workings.

In particular, the most recent review (O'Keefe & Hale, 1998) examined a number of moderator variables, concluding that DITF effects are dependably positive if the same person makes both requests, the requests have the same beneficiary, the requests are prosocial, the requests are made face-to-face, or there is no delay between the requests. However, the mean effects were not

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dependably positive if different persons made the requests, the requests had different beneficiaries, the requests were not prosocial, the requests were made over the telephone, or there was a delay between the requests. DITF effects were reported to be unrelated to concession size; specifically, larger concessions were not associated with larger DITF effects.

However, all three meta-analytic reviews had a procedural commonality that gives some reason for concern about the security of their findings. All three used the correlation coefficient as their primary effect size index. A typical DITF experiment provides frequencies for the cells of a 2 x 2 ("fourfold") table, with the two contrasts being DITF-versus-control and comply-versus-not-comply. These frequencies can straightforwardly be converted to a correlation coefficient (phi). The three extant DITF meta-analyses all followed such a procedure for obtaining an effect size for each study, with these individual correlations (effect sizes) then subjected to meta-analytic treatment.

But there is good reason to think that, where dichotomous outcome measures are used (as in DITF research, where effects commonly are represented as either compliance or noncompliance), the preferable effect size index is the odds ratio (or its cousin, the log odds ratio). Though odds ratios are commonly used to express effect sizes in some fields (e.g., biomedical research), they are relatively unfamiliar to many social scientists, and thus a brief description may be useful.

An odds ratio is, as its name suggests, a ratio of two odds. Conventionally the ratio is computed such that the odds in the numerator are the odds of success (compliance, improvement, etc.) given some experimental treatment; the odds in the denominator are the odds of success in some control condition. If the probabilities (odds) of success are exactly the same in the experimental and the control conditions—indicating no advantage of the experimental condition over the control condition—the odds ratio will be 1.00. When the experimental treatment is more effective than the control, the odds ratio will be larger than one (with no upper limit); when the experimental treatment is less effective than the control, the odds ratio will be smaller than one (with a lower limit of zero).

Where the outcome measure is genuinely dichotomous (such as alive-versus-dead, or pregnant-versus-not-pregnant, or comply-versus-not-comply), the odds ratio is a more appropriate effect-size index than the correlation coefficient. (Note that this is different from the question of how effects should be treated when a continuous variable has been dichotomized. For some discussion of that circumstance, see Hunter & Schmidt, 1990, pp. 46–47; cf. Rosenthal, 1994, p. 240). Comprehensive discussion of reasons for preferring odds ratios over correlations when outcomes are dichotomous is available elsewhere (e.g., Fleiss, 1994; Haddock, Rindskopf, & Shadish, 1998). Briefly, "the key benefits of the odds ratio are its invariance across sampling methods, the fact that it is not affected by unequal sample sizes, its invariance when either rows or columns of the fourfold table are multiplied by a constant, and its compatibility with logistic regression or loglinear models that already use the odds ratio as the measure of association. Finally, the odds ratio is not affected by differences in the marginal distributions of the fourfold table" (Haddock et al., 1998, p. 343). Perhaps it is unsurprising that Fleiss (1994, p. 259) describes the odds ratio as "the measure of choice for measuring effect or association when the studies contributing to the research synthesis are summarized by fourfold tables." Unfortunately, as Haddock et al. (1998, p. 339) indicate, "many meta-analysts incorrectly use correlations or standardized mean difference statistics to compute effect sizes on dichotomous data. Odds ratios and their logarithms should almost always be preferred for such data."

These considerations naturally raise the question of how much confidence one may place in previous meta-analytic conclusions concerning DITF effects. DITF outcomes are characteristically dichotomous (compliance or noncompliance), and thus DITF effects would most appropriately be represented as odds ratios. Previous meta-analyses, however, have used the correlation coefficient as the effect-size index, creating uncertainty about the degree of reliance that might be placed on those meta-analytic reviews. Hence we undertook an odds-ratio-based meta-analysis of DITF research. We generally followed the procedures of the most recent DITF meta-analytic review (O'Keefe & Hale, 1998)—the same cases, the same moderators, and so forth—but computed and analyzed odds ratios rather than correlations.

METHODS

Relevant Studies

We used the study list from our 1998 review, as it was the most recent and comprehensive DITF review. However, in two instances, investigators provided insufficient information to permit retrieving relevant frequencies, and thus the set of cases analyzed differed slightly from that analyzed previously. No frequencies were available for Goldman, McVeigh, and Richterkessing (1984, Experiment 1), and hence that case was not included. For Cantrill's (1985) "donation effort" data, we previously reported a composite effect size based on both main-experiment data and data from pilot study II; however, frequencies were available only for the main-experiment data and hence the present analysis used only that data. (Details concerning the cases analyzed are available from the first author.)

Effect Size Measure

The obtained frequencies were converted to odds ratios (following common procedures described by Fleiss, 1994; Haddock et al., 1998). When a cell frequency was zero, the correction described by Haddock et al. (p. 343; see also Fleiss, p. 252) was employed. Effects were coded so that differences favoring DITF conditions had an odds ratio greater than one, and those favoring control conditions had an odds ratio less than one.

Independent Variables

Primary analysis. In the primary analysis we examined the same possible moderators as in our earlier review, and relied on the same codings (which had satisfactory reliability). The moderator variables examined were requester variation (whether the two requests were made by the same person), beneficiary variation (whether the two requests had the same beneficiary), prosocialness of requests (whether two prosocial requests were used or not), medium (face-to-face or telephone), and the time interval between requests (whether there was a delay between requests).

Concession size. A separate analysis was undertaken to assess the possible effects of concession size. Following our earlier procedure, we examined studies in which different-sized initial requests were used with the same target request (or, alternatively, studies in which different-sized target requests were used with the same initial request). Every study providing such a comparison was identified and used in a separate analysis. The comparison of interest concerns how DITF effects vary between two conditions (namely, larger and smaller concessions), and thus requires a distinctive index. As a parallel to Cohen's (1988, p. 110) q (which represents the difference between two correlations as the difference between the z-transformed rs), we computed the difference between the two odds ratios. This index was computed such that positive values reflected larger DITF effects with larger concessions; negative values indicated smaller DITF effects with larger concessions.

Analysis

Unit of analysis. The unit of analysis was the request pair (the pair composed of a target request and its corresponding initial request). A measure of effect size was recorded for each distinguishable request pair found in the body of studies. Where a study employed an experimental manipulation corresponding to an independent variable in the current report, effect sizes were computed separately for the relevant conditions. When an experimental manipulation not germane to this review was employed, effect sizes were computed collapsed across such manipulation conditions. When a request pair was used in more than one study, the multiple estimates associated with that request pair were cumulated into a single summary estimate before inclusion in the analysis, by cumulating the raw frequencies and then converting the result to an odds ratio. In all this we followed our earlier procedures (O'Keefe & Hale, 1998, pp. 12–13).

Random-effects analysis. For the primary analysis, the individual odds ratios (effect sizes) were initially transformed to log odds; the log odds were analyzed using random-effects procedures described by Shadish and Haddock (1994), with results then transformed back to odds ratios for reporting (following Shadish & Haddock, p. 277). A random-effects analysis was employed in preference to a fixed-effects analysis because of an interest in

TABLE 1
Summary of Results

	k	Mean OR	95% CI	Q (df)
All cases	87	1.46	1.18, 1.82	271.4 (86)**
Same requester	79	1.59	1.28, 1.99	251.1 (78)**
Different requesters	8	.62	.40, .95	6.3 (7)
Same beneficiary	78	1.60	1.28, 2.00	243.6 (77)**
Different beneficiaries	9	.58	.36, .92	8.3 (8)
Prosocial requests	70	1.62	1.26, 2.08	229.0 (69)**
Nonprosocial requests	17	1.02	.73, 1.43	31.2 (16)*
Face-to-face	56	1.61	1.21, 2.14	172.3 (55)**
Telephone	31	1.25	.91, 1.71	90.5 (30)**
No time interval	80	1.56	1.25, 1.96	255.6 (79)**
Time interval	7	.70	.45, 1.10	5.9 (6)
Optimal moderator values	44	1.86	1.33, 2.61	140.0 (43)**
Suboptimal moderator values	43	1.16	.91, 1.48	108.9 (42)**

*$p < .05$.
**$p < .001$.

generalizing across request pairs (see Hedges & Vevea, 1998; O'Keefe, 1999).

RESULTS

Overall DITF Effects

Effect sizes were available for 87 distinct request pairs. The number of participants was 7641, with study sample sizes ranging from 30 to 607. Across all 87 cases, the random-effects weighted mean odds ratio was 1.46. The lower and upper bounds of the 95% confidence interval for this mean were 1.18 and 1.82, indicating a dependably positive overall DITF effect (i.e., an odds ratio significantly larger than one).

Moderating Factors

Primary analysis. Table 1 provides a summary of the results concerning the five main moderating variables, considered individually. For each variable, the results indicate an important moderating role. The mean effects are dependably positive (larger than one) if the same person makes both requests, the requests have the same beneficiary, the requests are prosocial, the requests are made face-to-face, or there is no delay between the requests.

The mean effects are not dependably positive, however, if different persons make the requests, if the requests have different beneficiaries, if the requests are not prosocial, if the requests are made over the telephone, or if there is a delay between the requests; in fact, significantly ($p < .05$) negative mean effects obtain with different requesters or different beneficiaries. Effect sizes are significantly ($p < .05$) larger when the same person makes both requests (as opposed to when different persons make the requests), when the requests have the same beneficiary (as opposed to having different beneficiaries), and when there is no delay between the two requests (as opposed to some time interval between them).

As a way of summarizing the effects of these five moderating factors, cases were classified into two categories: cases in which the moderating variables had values that would be expected to maximize the effect size (namely, two prosocial requests having the same beneficiary, made face-to-face by the same requester with no delay between the requests), and cases in which one or more of the moderating variables had a less-than-optimal value. As indicated in Table 1, in 44 cases all five moderating factors had optimal values, with a mean odds ratio across these cases of 1.86; this mean effect was dependably ($p < .001$) positive. In 43 cases at least one of the five moderating factors had a less-than-optimal value; the mean odds ratio across these cases was 1.16 (ns). Thus although the 95% confidence intervals for these two means overlap (the two means are different at $p < .15$), only under optimal conditions is the mean effect dependably positive.

Concession size. With respect to concession size, 15 distinguishable comparisons were available between DITF effect sizes obtained with relatively smaller and relatively larger initial requests (see O'Keefe & Hale, 1998, Table 1.3, p. 19). The n-weighted mean difference between odds ratios was $-.19$ (the unweighted mean difference was -1.06). Because meta-analytic techniques for handling such differences appear not well developed, confidence intervals were not constructed. However, the difference is plainly quite small, indicating no effect of concession size on DITF effects (and the observed direction of effect is not consistent with any expectation that larger concessions will enhance DITF effectiveness). Of the 15 comparisons, 7 were positive (indicating larger DITF effects with larger concessions) and 8 were negative (indicating smaller DITF effects with larger concessions).

As an alternative means of examining this effect, the mean odds ratios were computed for the "smaller concession" and "larger concession" cases given in O'Keefe and Hale's (1998) Table 1.3 (p. 19). For the smaller-concession cases, the mean odds ratio was 1.49 ($k = 15$); the bounds of the 95% confidence interval around this mean were 0.89 and 2.49. For the larger-concession cases, the mean odds ratio was 1.26 ($k = 15$); the bounds of the 95% confidence interval around this mean were 0.72 and 2.21. Plainly, these means are not significantly different.

DISCUSSION

This research was stimulated by a methodological concern, namely, whether previous meta-analytic conclusions concerning the DITF strategy could be relied upon given the use of the correlation coefficient as an effect size measure. The present results, obtained using the odds ratio as the effect size index, turn out to be quite consistent with those reported in our earlier review (O'Keefe & Hale, 1998).

Specifically, in both reviews DITF effects were found to be dependably positive if the same person makes both requests, the requests have the same beneficiary, the requests are prosocial, the requests are made face-to-face, or there is no delay between the requests; in both reviews, the mean effects were not dependably positive if different persons made the requests, the requests had different beneficiaries, the requests were not prosocial, the requests were made over the telephone, or there was a delay between the requests. Both reviews reported dependably negative mean effects with different requesters; the present review additionally found such a dependable negative effect with different beneficiaries. Both reviews found effect sizes to be significantly larger when the same person makes both requests (as opposed to when different persons make the requests), when the requests have the same beneficiary (as opposed to having different beneficiaries), and when there is no delay between the two requests (as opposed to some time interval between them). And in both reviews, DITF effects were unrelated to concession size; specifically, neither review found larger concessions to be associated with larger DITF effects.

Because the focus of the present report is methodological, we refrain from substantive interpretation of the obtained results. The general consistency of results suggests that conclusions relying on our 1998 results remain intact when a more appropriate effect-size index is employed. The only notable difference from the earlier results concerns the effects of beneficiary variations. Both analyses reported a negative mean effect size, but only the present analysis yielded a dependably negative effect. This simply reinforces our earlier claim that beneficiary variation is an important moderator of DITF effects.

Overall, then, in the present case, using odds ratios rather than correlations as the effect size index turned out to make a negligible difference in the results obtained. As Haddock et al. (1998) make clear, this is by no means guaranteed. Given the possibility that substantially different inferences might have been appropriately drawn from the existing literature than had previously been extracted, the present analysis provides important reassurance. Without an analysis of the sort reported here, there would be legitimate grounds for doubt about the previously-reported results.

Research on the DITF strategy is not the only area of communication research in which dichotomous outcome variables are common. Studies of other influence strategies (e.g., the foot-in-the-door strategy) often employ similar outcome measures, and it will obviously be prudent for meta-analysts of such research to employ odds-ratio-based procedures. Indeed, in the specific case of foot-in-the-door research, none of the three extant meta-analyses used the odds ratio as the effect size index (Beaman, Cole, Preston, Klentz, & Steblay, 1983; Dillard et al., 1984; Fern et al., 1986). Such a circumstance obviously invites reconsideration of the conclusions drawn from these meta-analyses.

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