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# Laying It on Thin: Analogical Cue Frequency in the Manipulation of Choice

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*Persuasive analogies consist of linguistic cues that invite audiences to represent a problem in terms of an analog and to make choices compatible with this manipulated representation. The authors explore how the frequency of linguistic cues moderates analogical bias in choice behavior. Participants read versions of a managerial decision scenario differing in the number of sports (e.g., game plan) or family (e.g., parent company) idioms used to describe situational attributes and then chose between analogically consistent and inconsistent response options. Analogies consisting of an intermediate number of cues elicited higher rates of analogically consistent responding than those of higher and lower cue frequency. When explaining their responses, participants referred to the sports or family analogies most often to rationalize rejecting the analogically consistent response option after reading high cue frequency versions. These findings indicate that there are lower and upper boundaries to a persuasive analogy's optimal cue frequency.*

**Keywords:** *analogy, idioms, decision making, choice*

We often use analogies in strategic discourse to invite inferences about ambiguous situations that reinforce our own construal of these situations. Encouraging audiences to compare and contrast these situations with artfully chosen analogs enables persuaders to manipulate the audience's perception of what constitutes a favorable course of action (Pratkanis & Aronson, 2001). For example, in the short-lived political debate preceding the American invasions of Iraq, supporters of U.S. involvement likened the conflicts to World War II

(a war most Americans believe we won), and opponents called attention to their similarities with the Vietnam War (which many consider a defeat). Several years earlier, Gilovich (1981) found that political science students were more likely to recommend intervention in a hypothetical foreign policy crisis when irrelevant features of the scenario (e.g., the name of the building used for press briefings) called to mind World War II (Winston Churchill Hall) rather than Vietnam (e.g., Dean Rusk Hall). The presence of these cues did not, however, lead students to judge the scenario as being more similar to one of the previous conflicts than the other. Subsequent research has confirmed that seemingly trivial cues can compel people to unwittingly employ analogies in their judgments and decisions (Gentner & Boronat, 1992, 1999; Roehm & Sternthal, 2001; Shimko, 1994; Spellman, & Holyoak, 1992; Stapel & Spears, 1996).

The reported research explored phrasal idioms' potential as an unobtrusive means of introducing analogies into decision scenarios. Many of the conventional figurative expressions we use to describe abstract concepts have a common analogical derivation (e.g., Lakoff & Johnson, 1980). For example, the idioms we use to describe

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corporate organizations reflect analogies to families (e.g., parent company), sports (e.g., sales team), ecological systems (e.g., business climate), and other source domains. In business correspondence, corporate executives tend to favor organizational idioms derived from analogies that cohere with their own beliefs about management (Morgan, 1997). How might this preference influence their correspondents' perceptions of the firm? There is no evidence that derivational analogies play a role in idiom comprehension (Glucksberg, Brown, & McGlone, 1993), but people are able to recognize analogical consistency among idioms (Bortfeld, 2002; Nayak & Gibbs, 1990). This recognition indicates that the underlying analogy is available in memory and can be accessed to participate in postcomprehension mental processes. Analogical access of this sort does not, however, guarantee that people have introspective access to its impact on their judgments (Gilovich, 1981; Nisbett & Wilson, 1977). Thus, the analogical consistency between idioms used to describe a decision scenario and a response option may lead people to favor the option but nevertheless overlook the unremarkable presence of cliché expressions in the description as a factor influencing their choice.

A demonstration of the idiomatic influence hypothesized above would constitute a "framing effect," whereby the manipulation of a psychologically consequential but normatively peripheral aspect of a problem description influences judgment or choice<sup>1</sup> (Tversky & Kahneman, 1981). Framing effects derive from noncanonical representations of a choice scenario's premises, the construction of which violates the assumption of "invariance" in economic theories of rational choice (Arrow, 1982; Kahneman, 2004). Framing theorists have typically treated these biased representations as the product of an instantaneous, unitary process initiated by shallow cues (Laboef & Shafir, 2003). For example, McNeil, Pauker, Sox, and Tversky (1982) induced different choices between surgery and radiation therapy by describing outcome statistics in terms of survival or mortality rates. Because thinking of outcomes in terms of survival (e.g. 90% short-term survival) is less threatening than thinking of them in terms of mortality (e.g., 10% immediate mortality), survival framing yielded higher preferences for a particular therapeutic method than mortality framing. In this demonstration, a single cue (outcome wording) was sufficient to induce a biased representation of the scenario. However, framing effects may in principle require the processing of multiple cues, with each making an incremental contribution to the activation of the biasing concept. For example, the presence of a single sports cliché (e.g., referring to a business strategy as a game plan) in a paragraph describing a managerial decision scenario seems unlikely to activate the "business is sport" analogy among readers. Multiple idiomatic cues (game

plan, score, sales team, etc.) are likely required to induce analogical activation sufficient to establish a preference for sport-framed response options.

Decision researchers have heretofore focused chiefly on brief scenarios in which one or two cues were sufficient to bias responses. However, inducing the aforementioned analogical bias may require several cues because the activation strength of any individual idiomatic cue is not sufficient to invoke the analogy on its own. How many analogical cues should there be? Kahneman (2004) argued that framing effects require "passive acceptance of the formulation given" (p. 703), a circumstance that depends critically on the decision frame being inconspicuous. Although multiple cues might be necessary to activate an analogy in semantic memory, a surfeit of cues could call respondents' attention to its presence. Once there are a sufficient number of cues to be noticeable, their ubiquity may induce a "demand awareness" that reduces (or reverses) the analogy's influence on responding (Page, 1970; Wegener, Petty, Smoak, & Fabrigar, 2004). This pattern of findings would indicate that there are lower and upper boundaries to a persuasive analogy's optimal cue frequency: There must be a sufficient number of cues to evoke the analogy but not so many that they make people mindful of the analogy's presence.

We report three experiments investigating the moderating role that cue frequency may play in the persuasive influence of analogies on choice behavior. In Experiments 1 and 2, we examined the influence of varying cue frequencies of a business-as-sport analogy on people's choice of strategies for resolving a problem in a managerial decision scenario. Experiment 3 provided a conceptual replication of the first experiment with a business-as-family analogy. The results of all three experiments suggest that the influence of analogies on choice behavior is moderated by cue frequency and mediated by people's awareness of analogy's discourse presence.

## EXPERIMENT 1

To explore the influence of a business-as-sport analogy on people's choice behavior, we asked undergraduates to read a brief description of a managerial decision scenario and to choose between two response options provided. Participants read one of five versions of the scenario, which differed in the number of highly conventional business-as-sport idioms (e.g., game plan) used to describe scenario attributes (e.g., business strategy). One of the response options provided contained an idiom that was analogically consistent with the idioms appearing in the scenario descriptions. After choosing a response option, participants were asked to explain the reasons for their choice. We predicted that

**TABLE 1:** Managerial Decision Scenario With Frame Cues (Control/Sports) Used in Experiment 1

DataCom, a medium-sized market research firm in the Midwest, recently acquired a smaller, younger firm—InfoTech—with staff and resources that nicely complement DataCom’s existing strengths. CEO Kevin Carlson views this acquisition as a major *achievement/score*. Kevin is confident that procuring InfoTech will improve his firm’s ability to do business in the *challenging domain/competitive arena* of marketing research. At the moment, Kevin is considering how he can make the InfoTech employees feel connected to their new corporate owner without detracting from the sense of independence that will keep them happy. Kevin has considerable experience in *training/coaching* new employees. He knows that making them comfortable is a critical factor in getting them *to be productive/off to a running start* in a newly restructured corporate environment. Creating a sense of camaraderie will also be important if he is to succeed in making sweeping changes to DataCom’s long-term business *strategy/game plan*.

One issue under consideration is whether to let InfoTech retain its original company logo on its stationery and advertising materials or to replace it with the DataCom logo. There is no reason whatsoever to believe that keeping or changing the logo will affect either firm’s ability to *handle/field* new clients. When Kevin *proposed/pitched* the idea of creating a combined logo, his advisors argued that it might confuse new clients about the relationship between DataCom and its new corporate subsidiary. Furthermore, the DataCom and InfoTech logos are familiar names in the Midwest, so changing to a new corporate logo might hurt the name recognition of both companies. So Kevin has decided to choose between either letting InfoTech retain its original logo or making it change to the DataCom logo.

Kevin is concerned about whether this issue might lead the new employees to feel that *they are at a disadvantage/the playing field is not level*. On one hand, allowing InfoTech to keep its original logo lets it preserve some vestige of the independent, small-firm identity it had before the acquisition. On the other hand, changing the logo is a simple way to remind InfoTech personnel that they are now *on the DataCom team*.

Which of the two options do you think Kevin should choose—should he allow InfoTech to retain their original logo or make them change to the DataCom logo? Please recommend one option or the other; do not offer an alternative strategy. In addition to your recommendation, please explain the reasons that led you to make this recommendation.

NOTE: Participants read one of five different versions of the scenario in which 0, 2, 4, 6, or 8 sports frame cues appeared.

relative to a control condition in which no sports idioms were present in the scenario description, participants would prefer the analogically consistent response option when a moderate number of these idioms were present. However, when there were a large number of idioms in the description, the analogy would become more noticeable, thereby inducing a demand awareness that reduces preferences for the consistent response option. As a measure of this awareness, we inspected participants’ written explanations of their decisions for references to the linguistic cues (i.e., the idioms in the scenario descriptions) or to the analogical source domain (sports in general). If awareness of the analogy’s presence serves to diminish its influence on responding, then we should observe a counterintuitive pattern of findings in which participants who make analogy-related references are among the least likely to have chosen analogically consistent responses.

## Method

**Participants.** Two hundred fifty-six University of Texas undergraduates (98 M, 158 F) enrolled in introductory communication studies courses participated in exchange for extra credit.

**Materials.** Different versions of a 15-sentence vignette (approximately 350 words) describing a management decision scenario were created for this experiment (see Table

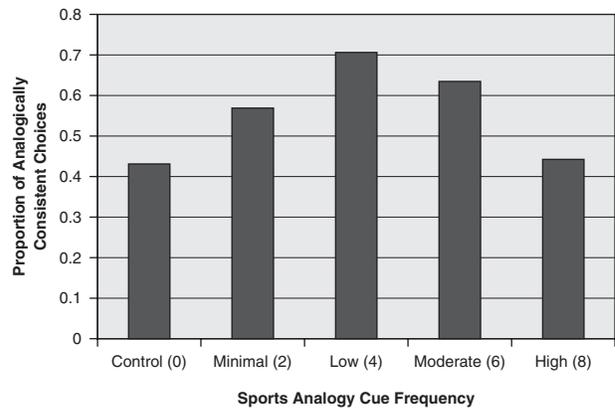
1). In this scenario, a large business firm—“DataCom”—acquires a smaller firm—“InfoTech”—that complements the larger firm’s strengths. Shortly after the acquisition, the CEO at DataCom contemplates whether to let InfoTech retain its original company logo on its stationery and advertising materials or to replace it with DataCom’s logo. The vignette offered plausible reasons for and against each course of action. On one hand, allowing InfoTech to retain its original logo enables its employees to “preserve some vestige of the independent, small-firm identity they had before the acquisition.” On the other hand, making InfoTech change to the DataCom logo offers “a simple way to remind InfoTech personnel that they are now on the DataCom *team*” [italics added]. The use of a sports idiom in the latter sentence served to code the recommended action (i.e., requiring that InfoTech change its logo) as consistent with a business-as-sports analogy. Immediately following the scenario description were instructions directing participants to choose one of two response options (allow InfoTech to keep its original logo, or require that it change to the DataCom logo) to recommend to the CEO and to describe the reasons for their choice.

The vignette versions differed in analogical cue frequency, that is, the number of business-as-sports idioms used to describe the scenario as well as the specific idioms comprising the analogy. Eight highly conventional expressions (e.g., game plan used to describe business strategy) were chosen as analogical cues. Each vignette version contained zero (control), two, four, six,

or eight cues. Cues in the experimental versions were distributed across the vignette in one of two formats. In the “outside-in” format, cues were initially placed at the beginning and end of the vignette, with additional cues added toward the middle. Using this format, the cue distributions across the 15-sentence vignette versions were as follows: Cues appeared in sentences 2 and 13 of the two-cue (minimal frequency) version; in sentences 2, 3, 10, and 13 of the four-cue (low frequency) version; in sentences 2, 3, 5, 9, 10, and 13 of the six-cue (moderate frequency) version; and in sentences 2, 3, 5, 6, 7, 9, 10, and 13 of the eight-cue (high frequency) version. In vignettes framed with an “inside-out” format, cues were initially placed in the middle of the vignette, with additional cues added toward the beginning and end. Using this format, the cue distributions were as follows: Cues appeared in sentences 6 and 7 of the minimal frequency version; in sentences 5, 6, 7, and 9 of the low frequency version; in sentences 3, 5, 6, 7, 9, and 10 of the moderate frequency version; and as aforementioned in the high frequency version. Our purpose in using different cue distribution formats was to manipulate cue frequency as a factor orthogonal to the specific idioms comprising the frame in a particular vignette version. Cues omitted in the control, minimal, low, and moderate frequency versions were replaced with literal expressions (see Table 1) that, according to participants in a pilot experiment, conveyed the same meaning. For example, the literal expression “challenging domain” was the control cue counterpart for the analogical cue “competitive arena.”

*Design and procedure.* This experiment employed a 2 X 5 factorial design with cue frequency and distribution format as between-participants variables. The dependent variables were participants’ choice of response option (analogically consistent or inconsistent) and the presence of references to the analogical frame in the written explanations they offered for their choices.

The experiment was conducted with groups of 25 to 50 participants at a time in a large classroom. On arrival at the classroom, they were randomly assigned to one of the questionnaire versions corresponding to the cue frequency and distribution format conditions. Each questionnaire contained instructions, one version of the managerial decision vignette, and the two response options. The instructions directed participants to read the vignette carefully, choose one of the response options to recommend to the CEO, and then explain the reasons for their choice in a paragraph at the bottom of the page. Participants were given unlimited time to write their responses but typically finished in 10 to 15 min. After turning in their completed questionnaires, they then read a typed debriefing



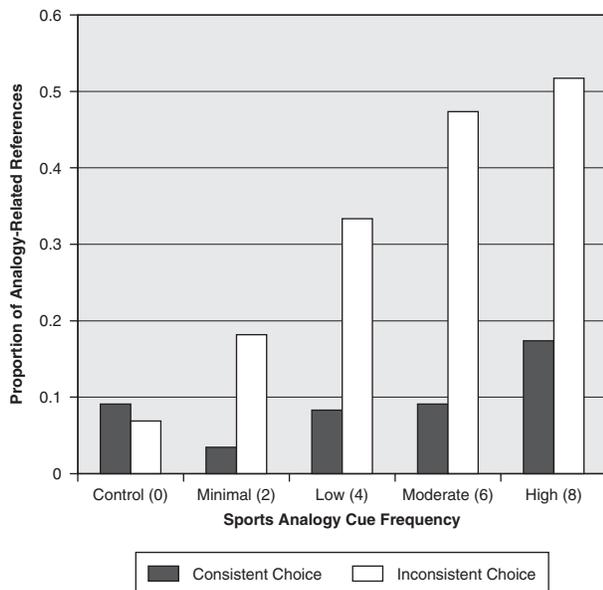
**Figure 1** Proportions of analogically consistent choice recommendations by analogical cue frequency (Experiment 1).

describing the purpose and method of the experiment and were given the opportunity to pose any questions they had to the experimenter.

## Results and Discussion

Initial analyses did not reveal any significant main effects or interactions involving demographic factors (gender and major) or cue distribution format ( $p > .15$  in all cases), so subsequent analyses collapsed across these factors. Participants’ response choices by cue frequency condition are illustrated in Figure 1. The patterns of analogically consistent and inconsistent choices differed among the cue frequency conditions,  $\chi^2(4) = 13.42$ ,  $p < .01$  ( $\phi_c = .23$ ). A planned analytical comparison (Zedeck & Keppel, 1989) indicated that the choice pattern in the intermediate cue frequency conditions (minimal, low, and moderate) differed reliably from the pattern in the control and high frequency conditions,  $\chi^2(1) = 11.44$ ,  $p < .001$  ( $\phi_c = .21$ ). Specifically, respondents in the intermediate frequency conditions were more inclined to choose the analogically consistent option than the inconsistent option (63.6% vs. 36.4%). In contrast, participants in the control and high frequency frame conditions did not reliably prefer the consistent option over its inconsistent counterpart; in fact, the pattern was just the opposite (43.1% vs. 56.8%), although not reliably so. These results suggest that the analogical frame was most effective in biasing respondents’ choices at intermediate levels of cue frequency.

We had hypothesized that as cue frequency increases, the likelihood that participants would be aware of the analogy would also increase and thereby reduce its influence on responses. The drop-off in analogically consistent responding between the moderate and high



**Figure 2** Proportions of choice explanations referring to frame by analogical cue frequency and choice recommendation (Experiment 1).

cue frequency conditions is consistent with this hypothesis. To determine whether this decrease was accompanied by an increase in analogy awareness, two independent, experimentally naive judges inspected participants' explanations of their choices for the presence of analogical references. The judges were instructed to count any mention of sports—the specific business-as-sport idioms used as cues, idioms and/or sports terminology that did not appear in the scenario descriptions, the word *sports* and its synonyms—as an analogical reference and thus as evidence of frame awareness.<sup>2</sup> The judges agreed 91.4% of the time (Cohen's  $\kappa = .80$ ) in distinguishing between explanations that did or did not make analogical references. The frequency of these references by cue frequency condition and choice recommendation is illustrated in Figure 2.

The frequency of analogical references differed reliably between participants who made consistent or inconsistent responses, regardless of cue frequency. As we predicted, these references were more frequent among those who made inconsistent than consistent responses (26.4% vs. 7.5%). Moreover, reference frequency increased with cue frequency dramatically among participants who made inconsistent responses (from 6.9% in the control condition to 51.8% in the high frequency frame condition) but only modestly among those who made consistent responses (from 9.1% to 17.4%, respectively). When participants made analogical references to explain rejecting the consistent response option, the majority (62.5%) alluded to problems with the application of the business-as-sports analogy in

the scenario (e.g., “. . . sometimes it's more important for employees to feel like they have an individual identity than to have 'team spirit' if you want them to be productive”) or to the inadequacy of the consistent response option as a way to fulfill the trappings of the analogy (e.g., “. . . there are other better ways to make team players out of the Infocom [*sic*] employees than changing their logo . . .”).

The pattern of analogical references observed is consistent with our claim that awareness of the analogy's presence in the scenario may diminish its influence on responding. To formally explore the intercession of awareness in the analogy's influence, we conducted a version of Sobel's (1982) mediation test appropriate for designs with a dichotomous dependent variable (Krull & MacKinnon, 1999; see also Baron & Kenny, 1986). The analysis proceeded in three stages. In the first stage, we computed a logit model with cue frequency as a predictor of analogical reference frequency ( $\lambda = 1.09$ ,  $SD_{err} = 0.34$ ). In the next stage, a second logit model was computed with analogical reference frequency as a predictor of response choice ( $\lambda = 0.88$ ,  $SD_{err} = .32$ ). In the third stage, the raw (unstandardized) parameter estimates and corresponding standard errors were used to compute the “Sobel test,” a  $z$  test of the hypothesis that the mediated effect equals zero in the population (Sobel, 1982). This analysis indicated that the mediation effect was significant,  $z = 2.13$ ,  $p < .05$ . Thus, we conclude that awareness of the analogy (as indicated by the presence of analogical references in participants' response explanations) played a mediating role in the relationship between cue frequency and response choice.

## EXPERIMENT 2

In Experiment 1, we found that the influence of a sports analogy on people's choice behavior in the managerial scenario was (a) moderated by the number of analogical cues present in the scenario and (b) mediated by people's awareness of these cues, as indicated by the frequency with which they mentioned sports-related topics when explaining their response choices. Taken together, these findings suggest that the analogy's influence was optimal at intermediate degrees of cue frequency, that is, when there were enough cues available to activate the analogy in the chooser's mind but not enough to draw undue attention to its presence in the discourse context. The generalizability of this conclusion is suspect, however, unless we demonstrate that the locus of influence is the consistency between analogical cues present in the scenario and a response option, independent of the option's literal import. Experiment 1 provided only part of this demonstration. The analogically

consistent option across all scenario versions in this experiment was to recommend that the acquired firm change its logo. Because the consistent option was kept constant, it is unclear whether our findings reflect a genuine analogical bias or merely a “change bias,” that is, a preference for changing the logo when a moderate number of sports idioms were present. In Experiment 2, we clarified our interpretation of these results by replicating the first experiment with the alternative response (keeping the original logo) portrayed as the analogically consistent option.

## Method

**Participants.** Two hundred forty-seven UT undergraduates (99 M, 124 F) enrolled in introductory communication studies courses participated in exchange for extra credit.

**Materials.** The materials were identical to those used in Experiment 1, with the exception of the last two sentences appearing in the third paragraph of the scenario description. In the new materials, these sentences read as follows:

“On the one hand, changing the logo is a simple way to remind InfoTech personnel that they are now DataCom employees. On the other hand, allowing InfoTech to keep its original logo lets it preserve some vestige of the *free agent* status it had before the acquisition” [italics added].

This change in wording served the purpose of reversing the portrayal of response analogical consistency used in Experiment 1. In the new materials, the option to allow Infotech to retain its original logo was portrayed as analogically consistent.

**Design and procedure.** The design and procedure were identical to those employed in Experiment 1.

## Results

Initial analyses did not reveal significant main effects or interactions involving demographic factors (gender and major) or cue distribution format ( $p > .20$  in all cases), so subsequent analyses collapsed across these factors. The distribution of analogically consistent and inconsistent responses differed among the cue frequency conditions,  $\chi^2(4) = 10.11$ ,  $p < .05$  ( $\phi_c = .20$ ). As in Experiment 1, the choice pattern in the intermediate (2, 4, and 6 cues) conditions differed reliably from the control and high frequency (0 and 8 cues, respectively) conditions,  $\chi^2(1) = 9.11$ ,  $p < .01$  ( $\phi_c = .18$ ). Specifically, respondents in the intermediate cue frequency conditions were more inclined to choose the analogically

consistent option (in this case, retaining the original logo) than the inconsistent option (62.1% vs. 37.9%). In contrast, participants in the control and high frequency conditions exhibited the opposite preference pattern (42.6% vs. 57.4%). These results indicate that the preference pattern we observed in Experiment 1 cannot be explained as simply an analogy-induced bias for a response option involving change; when the option to preserve the status quo (i.e., retain the original logo) was portrayed as analogically consistent, participants preferred this option, as before, at intermediate levels of cue frequency.

Two independent, experimentally naive judges coded participants' explanations of their response choices for analogical references, using instructions described in Experiment 1. The judges agreed 96.4% of the time (Cohen's  $\kappa = .88$ ) in distinguishing between explanations that did or did not make such references. As in Experiment 1, analogical references were more frequent overall among those who had chosen the inconsistent than the consistent response option (21.1% vs. 11.5%). When participants made analogical references to explain rejecting the consistent response option, a slight majority (53.4%) alluded to the inadequacy of the consistent response option as a way to fulfill the trappings of the analogy (e.g., “. . . the typical Infotech worker probably won't even register that Datacom is boss without seeing its logo all over everything”). Based on raw parameter estimates from logit models treating cue frequency as a predictor of analogical reference frequency ( $\lambda = .95$ ,  $SD_{err} = .28$ ) and analogical reference frequency as a predictor of response choice ( $\lambda = .83$ ,  $SD_{err} = .36$ ), Sobel's mediation test was marginally significant,  $z = 1.89$ ,  $p < .06$ . Thus, awareness of the analogy's presence (as estimated by the frequency of analogical references in participants' response explanations) appears to have interceded in the relationship between cue frequency and response choice, albeit to a weaker degree than in Experiment 1.

## EXPERIMENT 3

Experiments 1 and 2 demonstrated that people's choice behavior in a hypothetical managerial problem scenario can be influenced by the analogical consistency between scenario attributes and a response option, independent of the option's literal import. This influence was, however, moderated by cue frequency, with intermediate frequencies eliciting a higher rate of consistent responding than zero or high frequencies. Experiment 3 provides a conceptual replication of our initial findings using a different but nonetheless common analog in managerial discourse—specifically, the concept of family (e.g., parent company). Our sole purpose in

**TABLE 2:** Managerial Decision Scenario With Frame Cues (Control/Family) Used in Experiment 2

DataCom, a medium-sized market research firm in the Midwest, recently acquired a smaller, younger firm—InfoTech—with staff and resources that nicely complement DataCom’s existing strengths. CEO Kevin Carlson views this *acquisition/adoption* as a major achievement. Kevin is confident that *procuring InfoTech/housing InfoTech under the DataCom roof* will improve his firm’s ability to do business in the challenging domain of marketing research. At the moment, Kevin is considering how he can make the InfoTech employees feel connected to their new *corporate owner/parent company* without detracting from the sense of independence that will keep them happy. Kevin has considerable experience in training new employees. He knows that making them feel *comfortable/at home* is a critical factor in getting them to be productive in a newly restructured corporate environment. Creating a sense of *camaraderie/kinship* will also be important if he is to succeed in making sweeping changes to DataCom’s long-term business strategy.

One issue under consideration is whether to let InfoTech retain its original company logo on its stationery and advertising materials or to replace it with the DataCom logo. There is no reason whatsoever to believe that keeping or changing the logo will affect either firm’s ability to handle new clients. When Kevin proposed the idea of creating a combined logo, his advisors argued that it might confuse new clients about the relationship between DataCom and its new corporate *subsidiary/relative*. Furthermore, the DataCom and InfoTech logos are *familiar/household* names in the Midwest, so changing to a new corporate logo might hurt the name recognition of both companies. So Kevin has decided to choose between either letting InfoTech retain its original logo or making it change to the DataCom logo.

Kevin is concerned about whether this issue might lead the InfoTech employees to feel *disenfranchised/like stepchildren*. On the one hand, allowing InfoTech to keep its original logo lets it preserve some vestige of the independent, small-firm identity it had before the acquisition. On the other hand, changing the logo is a simple way to remind InfoTech personnel that they are now *part of the DataCom family*.

Which of the two options do you think Kevin should choose—should he allow InfoTech to retain their original logo or make them change to the DataCom logo? Please recommend one option or the other; do not offer an alternative strategy. In addition to your recommendation, please explain the reasons that led you to make this recommendation.

NOTE: Participants read one of five different versions of the scenario in which 0, 2, 4, 6, or 8 family frame cues appeared.

conducting this replication was to determine whether our initial findings regarding cue frequency were generalizable to another analogical source domain (Gentner & Markman, 1997).

## Method

*Participants.* Two hundred sixty-five University of Texas undergraduates (114 M, 151 F) enrolled in introductory communication studies courses participated in exchange for extra credit.

*Materials.* The DataCom-InfoTech vignette used in Experiment 1 was adapted for this replication (see Table 2). Although the literal scenario features and actions contemplated by the CEO remained the same, the sports idiom cues were replaced with highly conventional family idiom cues. To code the recommended action of changing the InfoTech logo as consistent with a business-as-family analogy, this action was characterized as “a simple way to remind InfoTech personnel that they are now *part of the DataCom family*” [italics added]. Immediately following the scenario description were instructions directing participants to choose one of two response options (allow InfoTech to keep its original logo or require that it change to the DataCom logo) to recommend to the CEO and to describe the reasons for their choices.

As in Experiments 1 and 2, the vignette versions differed in cue frequency and distribution format (outside-in

vs. inside-out). Eight highly conventional expressions (e.g., parent company used to describe corporate owner) were chosen as cues. Each vignette version contained zero (control), two, four, six, or eight cues. In the outside-in format, the cue distributions across the 15-sentence vignette versions were as follows: Cues appeared in sentences 2 and 12 of the two-cue (minimal frequency) version; in sentences 2, 3, 11, and 12 of the four-cue (low) version; in sentences 2, 3, 4, 10, 11, and 12 of the six-cue (moderate) version; and in sentences 2, 3, 4, 5, 7, 10, 11, and 12 of the eight-cue (high) version. In vignettes framed with an inside-out format, the cue distributions were as follows: Cues appeared in sentences 5 and 7 of the minimal frequency version; in sentences 4, 5, 7, and 10 of the low frequency version; in sentences 3, 4, 5, 7, 10, and 11 of the moderate frequency version; and as aforementioned in the high frequency version. As before, our purpose in using different cue distribution formats was to manipulate cue frequency as a factor orthogonal to the specific idioms comprising the frame in a particular vignette version. Analogical cues omitted in the control, minimal, low, and moderate frequency versions were replaced with literal expressions (see Table 2) that, according to participants in a pilot experiment, conveyed the same meaning.

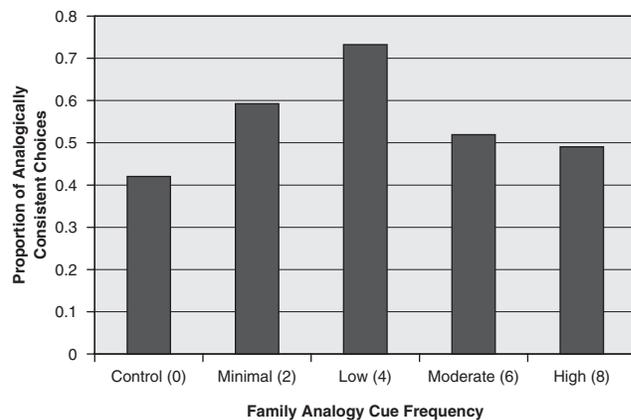
*Design and procedure.* The design and experimental procedure were identical to those used in Experiments 1 and 2.

## Results and Discussion

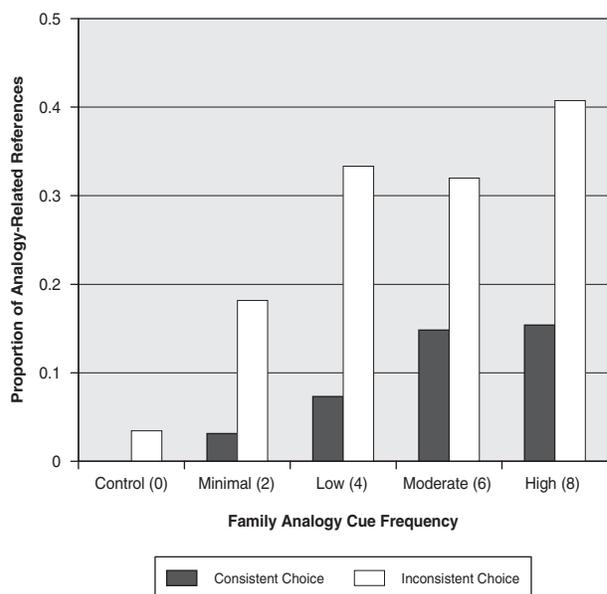
Initial analyses did not reveal any significant main effects or interactions involving demographic factors (gender and major) or distribution format ( $p > .15$  in all cases), so subsequent analyses collapsed across these factors. Participants' responses by cue frequency condition are illustrated in Figure 3. The distribution of analogically consistent and inconsistent choices differed by cue frequency,  $\chi^2(4) = 12.27, p < .03 (\phi_c = .21)$ . A planned analytical comparison indicated that the choice pattern in the intermediate cue frequency (2, 4, and 6 cue) conditions differed reliably from those in the control and high frequency (0 and 8 cue) conditions,  $\chi^2(1) = 6.61, p < .03 (\phi_c = .17)$ . Specifically, respondents in the intermediate frequency conditions were more inclined to choose the analogically consistent option than the inconsistent option (61.7% vs. 38.3%). In contrast, participants in the control and high frequency conditions did not exhibit a reliable preference for the consistent option over its inconsistent counterpart (46.5% vs. 53.5%). These results suggest that the analogical cues were most effective in biasing respondents' choices at intermediate frequency levels. Although this choice pattern was similar to those observed in Experiments 1 and 2, it differed in one subtle respect. Specifically, the drop-off in consistent responding across the low, moderate, and high cue frequency conditions was more precipitous in the current experiment (73.4%, 51.9%, and 49.0%, respectively). Of the various factors that might have produced this difference, one that is especially plausible is the greater familiarity of sports clichés than family clichés in business discourse (Morgan, 1997). By virtue of their conventionality in the scenario context, the sports idioms might have been individually less noticeable than the family idioms, and thus could form a larger critical mass of cues before respondents became aware of the analogy's presence.

Two independent, experimentally naive judges inspected participants' explanations of their choices for the presence of analogical references, using instructions described in Experiment 1. The judges agreed 95.8% of the time (Cohen's  $\kappa = .86$ ) in distinguishing between explanations that did or did not make frame-related references. The proportion of these references by cue frequency and participants' choice recommendations is illustrated in Figure 4.

The frequency of frame-related references differed reliably between participants who made consistent or inconsistent response choices regardless of cue frequency. As we predicted, family-related references were more frequent among those who had chosen the inconsistent than the consistent response option (25.5% vs. 8.1%). As in Experiment 1, of the participants who



**Figure 3** Proportions of analogically consistent choice recommendations by analogical cue frequency (Experiment 3).



**Figure 4** Proportions of choice explanations referring to frame by analogical cue frequency and choice recommendation (Experiment 3).

made analogical references to explain rejecting the consistent response option, most (56.7%) referred to problems with the application of the business-as-family analogy in the scenario (e.g., “. . . I doubt that some stupid letterhead is going to make any of the InfoTech people feel like their [*sic*] in a new family . . .”). Based on raw parameter estimates from logit models treating cue frequency as a predictor of analogical reference frequency ( $\lambda = .89, SD_{err} = .30$ ) and analogical reference frequency as a predictor of response choice ( $\lambda = .87, SD_{err} = .33$ ), Sobel's mediation test was marginally significant,  $z = 1.97, p < .05$ . Thus, awareness of the analogy's presence (as estimated by the frequency of

analogical references in participants' response explanations) appears to have played a role in transmuting cue frequency's influence on response choice.

## GENERAL DISCUSSION

Managerial scientists often test competing theories by examining how changes in institutional and economic variables (e.g., high-tech or low-tech firms operating in an economic boom or slump) influence responses in a decision scenario when presentational elements (e.g., the language used to describe employer-employee relations) are held constant across scenario versions (Kardes, 2001). In the present study, we used an alternative approach in which structural variables were held constant, while the presentation format varied across conditions. Our results suggest that changes in analogical format can exert a reliable impact on people's response choices in a decision scenario as well as the explanations they offer for their choices.

Rhetoricians advise us to greet an analogy in strategic discourse with great skepticism because the implied comparison between the source and target domains (e.g., between a sports team and a business) might not draw our attention to the most consequential target properties. Classical rhetorical theory recommends that we judge an analogy's explanatory value by assessing whether it highlights significant similarities without ignoring equally pertinent dissimilarities (Corbett, 1990). If we are to perform this assessment, however, we must be aware of the analogy's presence in the discourse. When participants in our experiments alluded to the analogical frame in their choice explanations (our proxy for analogical awareness), they did so by and large to rationalize rejecting the analogically consistent response option. This finding comports with Strack, Schwarz, Bless, Kubler, and Wanke's (1993) demonstration that awareness of a potential source of influence on one's judgments precipitates a contrastive response mode (i.e., responding in opposition to source information) that differs markedly from the assimilative mode exhibited when the source is covert. However, awareness of the influential source in our experiment was not precipitated by a blatant warning about its presence (Stapel, Martin, & Schwarz, 1998), but by a surfeit of the cues comprising this source. Significantly higher rates of analogical references occurred when (a) cue frequency was high, not moderate or low, and (b) participants opted for the analogically inconsistent response option. We interpret this pattern as evidence that the influence of the analogy on people's response choices was moderated by its salience in the discourse context. Thus, as with flattery, there are diminishing persuasive returns for "laying it on thick"

analogically; in the present experiment, laying it on thin met less resistance.

Although decision framing theorists have not heretofore directly investigated the issue of cue frequency, this notion does shed some light on seemingly disparate ceiling and floor effects that have been documented in past framing research. For example, Levin et al. (1986) found that framing effects on gamble evaluations were relatively more pronounced at intermediate rather than extreme levels of probability of winning or losing. In the domain of consumer behavior, Beach, Puto, and Heckler (1996) found no effects of purchase satisfaction framing (i.e., asking consumers to predict the likelihood that they will be satisfied with their purchase or alternatively to estimate how likely that they will be dissatisfied with their purchase) when participants evaluated highly desirable or undesirable products. Typical framing effects were observed only when they evaluated products at intermediate levels of desirability.

Our findings demonstrate the role of cue frequency in exploring the composition and efficacy of persuasive analogies in decision making. However, we have investigated only one property of analogical cues—their frequency in the discourse context—among several that might in principle contribute to their influence. Another factor likely to play a role is the graded salience of any given cue (Giora, 2003). For example, cue salience might vary in the paradigm we employed as a function of the conventionality of the figurative expressions used, such that highly conventional expressions (e.g., business game plan) are individually less salient than relatively novel expressions (e.g., boardroom huddle). In addition, audience members' familiarity with and/or attitudes toward the frame concepts employed might also render an analogy as more or less salient. The panoply of message and audience characteristics that might contribute to a cue's salience (and thereby to "influence awareness") constitutes an important dimension of persuasive analogies that deserves serious attention in future research.

The human mind's remarkable capacity in certain domains (vision, syntactic processing, person perception, etc.) to abstract canonical representations from variable stimulus features does not extend to decision making (Levin & Gaeth, 1988). As a result, our intuitive decisions can be unduly influenced by factors that determine the accessibility of object and event features in a scenario. Highly accessible features influence decisions more than less accessible features regardless of their practical import to an optimal choice between response options (Kahneman, 2004; McGlone, Kobryniewicz, & Alexander, 2005). Social scientists have identified linguistic framing as a powerful influence on feature accessibility in people's assessments of risk (Arrow, 1982; Tversky & Kahneman, 1981), consumer

goods (Levin et al., 1986), political candidates (Nelson, Oxley, & Clawson, 1997; Price, Tewksbury, & Powers, 1997), military conflict (Gilovich, 1981; Spellman & Holyoak, 1992), and temporal experience (McGlone & Harding, 1998). However, not all frames are equally successful in inducing “passive acceptance of the formulation given” in a particular scenario. In a manner similar to the way one chooses a literal frame with the right characteristics (size, shape, color, etc.) to bring out an oil painting’s best attributes, so must strategic communicators choose analogical frames that subtly accentuate the scenario features that best serve their persuasive goals.

## NOTES

1. As noted by Levin, Schneider, and Gaeth (1998), the terms *frame* and *framing effect* have been used to refer to a variety of phenomena in the research literatures of communication, consumer research, economics, political science, and psychology. The phenomenon under investigation in the present study is what Levin et al. characterize as “attribute framing,” in which attributes of a complex object or event are the focus of the framing manipulation.

2. We are aware that this measure likely overestimated frame awareness—that is, it is possible that participants might have made references to sports when explaining their choices that were not motivated by conscious recognition of the analogical frame. Note, however, that this potential inflation factor works against our hypothesis that participants would be more likely to make frame-related references after having made a frame-inconsistent choice. The base rates of spontaneous or nonconsciously primed sports references should be equal regardless of choice consistency, and thus their occurrence favors the null hypothesis.

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