ABSTRACT

Title of Document:	SURVIVAL OF THE PERSUASIBLE: AN EVOLUTIONARY APPROACH TO INTERPERSONAL INFLUENCE
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This dissertation used evolutionary theory to explain the persuasive effects of source characteristics on message targets. It was argued that targets are differentially persuaded by sources who possess certain phenotypic characteristics because such responses increased reproductive success over the course of human history and were therefore evolutionarily adaptive. Attitude and attributions toward the source and message were hypothesized to be affected by a three-way interaction between source characteristic, the source's communicated intention of goodwill, and participant dominance. In addition, a structural model was used to test whether source and message attributions mediated the effect of source characteristics on attitude.

Four experiments were conducted to test different phenotypic cues: facial symmetry (Experiment 1, $N = 287$), facial sexual dimorphism (Experiment 2, $N = 278$), voice pitch (Experiment 3, $N = 286$), and facial similarity (Experiment 4, $N = 100$). These phenotypic manipulations were crossed with message manipulations in

which the source framed the advocated action as either benefitting the source or the message targets. Participants were randomly assigned to between-subjects experimental conditions in which they read or listened to a series of persuasive messages attributed to different sources.

Results provided weak support for the hypothesized interaction. Significant two- and three-way interactions were found, but these interactions did not fully support predictions and lacked consistency across experiments. Further, structural equation models demonstrated few and inconsistent effects of source characteristics on attitude or attributions toward the source and message. Despite these findings, the significant results provide some reason to believe that targets' susceptibility to influence may have some evolutionary underpinnings. Implications, limitations, and directions for future research are discussed.

SURVIVAL OF THE PERSUASIBLE: AN EVOLUTIONARY APPROACH TO INTERPERSONAL INFLUENCE

By

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Chapter 1: Introduction

The source of a persuasive message has an undisputed effect on its influence. Over the last half century, research has found that audience persuasibility is affected by a variety of source characteristics, including physical attractiveness, biological sex, and similarity to the recipients of the influence attempt (Petty & Wegener, 1998; Pompitakpan, 2004). However, the accumulation of research on source characteristics that influence persuasion lacks theoretical connection. Without one, the list of characteristics known to affect persuasion cannot be reduced to a parsimonious explanation about how source attributes function to facilitate behavior and attitude change. The current research aims to provide such an explanation.

Evolutionary theory serves as an explanatory mechanism to account for findings regarding sources' attributes that influence persuasion. I argue that over the course of human history, people evolved the tendency to be influenced by individuals who possess certain physical characteristics. Humans who tended to be persuaded by individuals with these characteristics benefited from changing their behavior, which increased their likelihood of survival and their reproductive fitness and allowed them to pass along these tendencies to their offspring. Thus, the proclivity to be persuaded by individuals with certain characteristics arguably has evolutionary origins, manifesting as a biological mechanism that is reproduced generation after generation. The current dissertation reviews the main source characteristics that research has shown to influence persuasion and explores how attention to such attributes as cues to source credibility was evolutionarily advantageous for early humans and are therefore biologically predisposed to influence which sources are persuasive. Advancing such

an evolutionary explanation of persuasibility provides a comprehensive and coherent rationale for why seemingly disparate source characteristics affect perceptions of source credibility and persuasion among targets of social influence.

The credibility of sources has long been known to affect the persuasiveness of their messages. On the one hand, Aristotle (1954) treated source credibility—*ethos*—as a quality created by speakers during oration that aided in their ability to persuade. On the other hand, Cicero viewed this quality as a trait of speakers independent of message presentation (e.g., reputation) that preexisted oration (Herrik, 2013). More recently, scholars have conceptualized credibility *as attributed to* sources by targets of persuasion (Hovland, Janis, & Kelley, 1953; O'Keefe, 2002). In this way, source credibility "is not a commodity that message sources possess," but the "perception of trustworthiness and expertise that sources are able to engender in a target audience" (Stiff & Mongeau, 2003, p. 107). The perspective conveyed here also assumes that persuasion functions according to cognitive processes that occur in targets of persuasion rather than according to any intrinsic credibility of sources. Sources possess credibility only insofar as message recipients attribute relevant characteristics (e.g., trustworthiness) to them.

However, the present research diverges in its treatment of audience susceptibility to influence. Although persuasion researchers typically assume targets of persuasion attribute credibility through a source's communication of qualities like expertise and trustworthiness (i.e., the corollary to Aristotelian credibility), I argue that targets of persuasion have a proclivity to ascribe credibility to sources with certain physical qualities independent of, and in combination with, the actual

communication (i.e., the corollary to Ciceronian credibility). Audiences have a tendency to be influenced by persuaders who possess specific phenotypic characteristics (i.e., observable expressions of traits). In this way, though sources are not inherently persuasive, targets of persuasion are inherently predisposed to be more or less persuaded by different kinds of sources. Sources do not possess credibility; rather, they possess characteristics that elicit persuasion in their audience.

Source credibility comprises many dimensions. Aristotle first depicted *ethos* as a multidimensional function of intelligence, character, and goodwill (1954; Sattler, 1947). Since becoming a topic of interest to social scientists, source credibility has been consistently distinguished by two dimensions (Pompitakpan, 2004; Stiff & Mongeau, 2003): expertise—"the extent to which a communicator is perceived to be a source of valid assertions"—and trustworthiness—the "degree of confidence in the communicator's intent to communicate the assertions he [or she] considers most valid" (Hovland et al., 1953, p. 21). Many factor analytic studies have identified credibility dimensions like competence, dynamism, objectivity, authoritativeness, and character (Berlo, Lemert, & Mertz, 1969; Markham, 1968; McCroskey, 1966; McCroskey, Holdridge & Toomb, 1974; Miller, 1987; Whitehead, 1968).[1] A more recent typology made a factor analytic case for the Aristotelian concept of goodwill to appear as a distinct dimension of source credibility, resulting in a three-dimensional construct of competence, trustworthiness, and goodwill (McCroskey & Teven, 1999).

[1] It should be noted that results of factor analysis are contingent on the items initially selected for inclusion, which may lead to invalid claims about a concept's dimensions (McCroskey & Young, 1979). Take McCroskey and Young's example: if items like height, weight, and belt-size are entered with other items to assess source credibility, a new "size" dimension would emerge as a component of credibility.

For reasons soon to be reviewed in detail, the McCroskey and Teven dimensions capture aspects of credibility that are theoretically relevant to the current evolutionary argument. Although scholarly conceptualizations of credibility have differed, one thing has remained consistent in its study: Targets who report greater perceptions of source credibility are more likely to be persuaded to change their attitudes and behaviors (Hovland & Weiss, 1951).

The focus of this research is not solely on the effect that source characteristics have on perceived credibility as a means to persuasion (i.e., credibility as a mediator of the effect of source characteristics on persuasion). A review of relevant research noted that source credibility explains an average of nine percent of the variance in persuasion (Wilson & Sherrell, 1993), showing that credibility can in fact act as a weak antecedent to behavior change. However, it is also clear that source characteristics (e.g., physical attractiveness) influence persuasibility of message recipients independently of perceptions of credibility (Horai, Naccari, & Fatoullah, 1974; Joseph, 1977; Maddux & Rogers, 1980; see Pompitakpan, 2004, for a review). Such a direct effect on persuasibility suggests that sources may influence targets in ways not manifested in attributions made about the source or message. One purpose of the current research is to assess whether source cues directly affect attitudes while simultaneously accounting for other intervening variables known to affect message acceptance (e.g., perceived source credibility and message quality). For this research, an evolutionary argument is made to explain why recipients of messages respond to source characteristics by becoming more or less persuasible.

A large body of research has attempted to identify factors that influence a

person's ability to persuade. Influential source characteristics that have been shown to affect persuasion include physical attractiveness, power, similarity, group status, and demographic variables like sex, age, and race (Perloff, 1993; Petty & Wegener, 1998). A more recent simplified list identifies important source characteristics as physical attractiveness, biological sex, and similarity to the message target (Pompitakpan, 2004). Comprehensive reviews of persuasion research also conclude that physical attractiveness and similarity appear to be influential characteristics on a source's ability to persuade (O'Keefe, 2002; Stiff & Mongeau, 2003). Though much effort has been spent adding to and modifying this list of source characteristics, a single explanation that accounts for *why* these particular factors are influential to perceptions of source credibility has yet to be advanced. Without such an explanation, scholars have no way to judge whether the list of influential source characteristics is complete, and if not, what sorts of characteristics should serve as candidates to be added to it.

Dual-process explanations exist to account for *how* source credibility cues influence persuasion. The elaboration likelihood (Petty & Cacioppo, 1981) and heuristic systematic (Chaiken, 1980) models assume that persuasion occurs through both an effortful route that requires active processing of arguments and through a less effortful route, which relies on simple cues that foster attitude change without thoughtful scrutiny of a message's arguments. Processing via the latter route has been often used to explain the general effects of source characteristics on persuasion (Chaiken & Maheswaran, 1994; Petty, Cacioppo, & Goldman, 1981). Thus, although communicator characteristics are not limited to being processed solely through the

peripheral or heuristic route—source characteristics relevant to a message topic may be processed thoughtfully (Chaiken, Duckworth, & Darke, 1999; Kruglanski & Thompson, 1999; Petty & Cacioppo, 1981; Petty, Wheeler, & Bizer, 1999)—source characteristics are predominantly treated in the literature as a "simple cue as to the validity of a message" (Petty & Cacioppo, 1986, p. 142).

Dimensions of source credibility like trustworthiness (Priester & Petty, 1995) and expertise (Kiesler & Mathog, 1968; Wood & Kallgren, 1988), as well as source factors like attractiveness (Chaiken, 1987), biological sex (Goldberg, 1968), and race (Whittler, 1989), are thought to act as peripheral cues to persuasion (Petty & Wegener, 1998). Peripheral and heuristic processing is said to occur because people act as "cognitive misers" in order to function efficiently in a social world that would otherwise be overwhelming (Taylor, 1981). Still, these theories provide little explanation for *why* certain characteristics enhance source credibility when processed peripherally. Indeed, Petty and Cacioppo (1986) admitted that none of their procedures used to "uncover potential [peripheral] cues are capable of indicating *why* the cue was effective" (emphasis in original, p. 35). For example, why does similarity, rather than dissimilarity, serve to enhance persuasion peripherally? Dual-process theories do not comment on this issue except to suggest that some cues "trigger relatively primitive affective states" (Petty & Cacioppo, pp. 34-35) or elicit rule-based inferences, which may have "developed by individuals through their past experiences and observations" or "may stem from a lower-order rule" (Chaiken, 1980, p. 753) that affect persuasion. The circumstances under which affective, basal, or higher-order rules lead to persuasion go unmentioned. Indeed, many explanations

for the effect of peripheral or heuristic cues are theorized *ad hoc* (Burgoon, 1989; Stiff & Mongeau, 2003). A framework that allows for sensible predictions regarding the effect of source cues has been lacking.

Evolutionary psychology (Barkow, Cosmides & Tooby, 1992; Buss, 1995) provides an *a priori* rationale for *why* certain source characteristics should affect persuasion in predictable and consistent ways. As will be shown, humans' general tendencies to be persuaded by individuals with similar characteristics suggest that persuasibility has biological origins. Indeed, perceived source characteristics function similarly between individuals of different cultures and races (Singh, 1970; Yoon, Kim, & Kim, 1998), suggesting that similarities among perceptions of sources of persuasion might be, at least to some degree, hardwired.

The major thesis of this dissertation is that many perceptual attributions of certain source characteristics, which act as cues to influence persuasibility, are the product of evolutionary adaptation. This dissertation will experimentally test in new ways four source characteristics that have previously been shown to affect persuasion. These studies offer a greater degree of experimental control by testing evolutionary hypotheses with previously untested phenotypic operationalizations of persuasive source cues. Besides demonstrating that a source's facial symmetry, facial masculinity, vocal pitch depth, and facial similarity influence attitude change, these studies are intended to test whether such source characteristics interact with message presentation (i.e., selfish vs. selfless sources) and with target characteristics (i.e., participant dominance) to influence attitude change.

The chapters that follow are intended to provide support for this novel approach to interpersonal influence. First, a detailed treatment for the evolutionary theoretical argument for persuasion will be presented, with falsifiable predictions proposed. Next, a pilot study is reported that identifies messages to be included in the subsequent experiments. Then, the methods and results of the four experiments are provided to test the proposed hypotheses. Finally, the implications and limitations of the studies are discussed in regard to how they inform an evolutionary explanation of influence.

Chapter 2: Evolution and Persuasion

Darwin's (1859) theory of evolution by natural selection explains the method by which life forms come to possess their physical and behavioral characteristics. It is a theory of process: Evolution gives us a mechanism to understand how and why biological organisms developed particular attributes. In brief, traits are transferred from parents to offspring and are subject to random mutation and selection. Those heritable characteristics that allow individual organisms to reproduce successfully become more common in a population throughout successive generations. That is, attributes are adaptive if they increase the proliferation of one's genetic material. Here, adaptiveness refers to "an inherited and reliably developing characteristic that came into existence as a feature of a species through natural selection because it helped to . . . facilitate reproduction during the period of its evolution" (Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998, p. 535).

Evolutionary psychology (Barkow, Cosmides & Tooby, 1992; Buss, 1995), a subfield of evolutionary theory, recognizes that just as there is a genetic component to an organism's physical traits, so too are cognitive, affective, and behavioral attributes linked to one's genes. These characteristics are capable of spreading throughout a human population according to the relative fitness they provide. Such attributes are known as evolved psychological mechanisms (Buss, 1995). A common example of an evolved psychological mechanism among humans is our preference for sweet and fatty foods. Among our human ancestors, the consumption of such foods increased energy reserves to allow survival in times of hardship. Thus, humans who found sugars and fats tasty ate more of them, allowing them to reproduce successfully and

raise healthy children who also found sugars and fats tasty.

Evolved predispositions also explain human communication (Beatty & McCroskey, 2001; Koerner & Floyd, 2010). As will become apparent, I argue that the proclivity to perceive cues that made an *actually* reliable, capable, and benevolent source *seem* more trustworthy, expert, and well intentioned (i.e., more credible and persuasive) was selected for in human history. The central premise here is that the associations between communicator characteristics (e.g., attractiveness, sex, and similarity) and persuasibility serve as evolved psychological mechanisms. Just as we evolved to find fatty foods tasty, we have a tendency to be persuaded by physically attractive sources, as will be shown below.

Evidence that persuasibility may have an evolutionary component lies in rarely cited research conducted by the Yale group. Janis and Field (1956) concluded that susceptibility to persuasion functions as a predispositional individual difference. They found that across a variety of unrelated topics, the same individuals tended to change their attitudes. Linton and Graham (1959) showed that persuasion and personality are highly related and concluded that "persuasibility is not an isolated phenomenon, but rather the product of certain underlying attributes of the personality" (p. 101). Persuasibility has also been found to be trait-like within children (Abelson & Lesser, 1959), suggesting that individual differences in susceptibility to influence are present from a young age. That individuals possess a persuasibility trait, regardless of topic or age, supports the assumption that the tendency to be influenced has some degree of innateness.

Persuasion in the Environment of Evolutionary Adaptiveness

To understand why certain source cues affect persuasion, one must take into account the world in which these cue preferences would have evolved. Another tenet of evolutionary psychology is the need to consider the environment in which genetic traits were adaptive—the environment of evolutionary adaptiveness (Buss, 1995; Irons, 1998). Hundreds of thousands of years ago, early humans congregated into small social groups because it was advantageous for survival (Dunbar, 1996). That is, the individual fitness of each group member increased through the help of others in the group. Due to environmental changes in early human history, our ancestors relied on animal proteins, in addition to plants, as a nutrient source, which required cooperation and coordination to hunt and food-share successfully (Kaplan, Hill, Lancaster, & Hurtado, 2000; Milton, 2003). Group members who tended to work together were more successful in obtaining animal proteins than those who hunted alone, in gathering limited food resources than those who gathered alone, and in rearing children in a dangerous environment than those who raised them alone, and the characteristics that promoted this sort of cooperation were passed down to offspring. Thus, within-group cooperation and apparent altruism were selected for over the course of human history (Dunbar, 1996).

Evolutionary psychology has the potential to explain aspects of persuasion. Researchers are beginning to apply principles of natural to explain situations in which attitude change occurs. For one, evolutionary theory has been used in the marketing literature to explain how people process persuasion heuristics (e.g., social proof and scarcity) differently depending on the affective state they are in during message

exposure (Griskevicius, Goldstein, Mortensen, Sundie, Cialdini, & Kenrick, 2009; Griskevicius, Shiota, & Neufeld, 2010). Even works in popular literature treat the efficacy of some marketing tactics on consumer behavior as functions of evolution (Miller, 2009; Mlodinow, 2012; Saad, 2011).

In regard to persuasive source characteristics, attention to certain persuader cues possibly served individuals' interests in the environment of evolutionary adaptiveness. Targets of interpersonal persuasion would do well by accurately perceiving characteristics of a competent, benevolent, and trustworthy person, which signal that that person should be trusted and believed. Targets persuaded by such sources would likely then benefit from the capability, goodwill, and trustworthiness of such a source, thereby aiding in their own reproductive success. For example, because early humans relied on animal-source foods for much of their diet, it would have been beneficial to coordinate hunting groups comprising those most capable of bringing home large game *and* those most willing to share their food resources. Accepting the guidance of a capable and benevolent person (i.e., being persuaded) would result in more food for one's self and offspring.

Coordination in the environment of evolutionary adaptiveness better occurred through leadership and followership (Van Vugt, 2006). The willingness to follow certain individuals should be adaptive if those leaders were intelligent, competent, and generous (Van Vugt, 2006). It follows that allowing oneself to be persuaded to engage in action advocated by these individuals would also have brought benefits to an individual in a time when obtaining food and safety were problematic. Indeed, Griffin (1967) demonstrated that interpersonal trust—the "reliance upon the

communication of another person in order to achieve a desired but uncertain objective in a risky situation" (p. 104)—is influenced by perceptions of source credibility. Group members who were more likely to trust and be influenced by physically and intellectually fit individuals were also more likely to benefit from additional food and defense resources due to coordination by the leader. Group members who did not trust and therefore were not influenced by these individuals did not benefit from this coordination and subsequently did not produce as many surviving offspring. In this way, the tendency to be persuaded by physically and intellectually capable individuals would spread through a human population. Thus, two related prerequisites are necessary for persuasibility via credible sources to evolve because it increased the individual fitness of humans: 91) accurately perceiving the observable genetic attributes that characterize successful, dependable, intelligent, and benevolent individuals; and 92) following the advocated direction of individuals who possess these qualities.

The prestige hypothesis provides additional reason to expect that susceptibility to influence has genetic origins. Prestige psychology (Henrich & Gil-White, 2001) accounts for low status individuals' predisposition to imitate individuals of higher status. By copying successful people, those of lower status benefit in two ways: They gain the opportunity to be in the company of the high status individual and any associated privileges (e.g., surplus food obtained by the high status individual), and they learn which actions to emulate that are likely to result in gains in resources. Hernrich and Gil-White reported considerable empirical evidence showing that individuals of low status emulate those of high status, effectively supporting the

idea that the tendency serves as an evolved psychological mechanism. Just as low status individuals who grant prestige to high status individuals improve their own fitness, targets of persuasion who align their attitudes and actions with those advocated by a capable and trustworthy source stand to benefit from changes in attitudes and behavior.

Prestige and dominance go hand-in-hand. For one, dominant men tend to have higher social status (Mueller & Mazur, 1996), physical strength (B. Fink et al., 2007), and reproductive potential (Rhodes, Simmons, & Peters, 2005). The ability of a person to avoid dangerous confrontation with others, especially those who are more dominant, would aid survival. Parker (1974) went as far as to say that a competitor's formidability is a function of the costs that an organism can impose (i.e., the damage it can inflict) on others. Thus, the ability to perceive cues of formidability and dominance in another person would have allowed one to avoid conflict (Puts et al., 2006, 2007), but it also would have served as a valuable indicant of whether persuasive deference or obstinacy would lead to desirable outcomes. Conforming to the advocated action of a dominant person would likely have kept one from initiating conflict. Costly conflict may end in serious injury or similar negative consequences (Sell et al., 2009), and such costs are thought to have provided influential selection pressure (Keeley, 1996).

Of course, perceptions of desirable outcomes would be contingent on the dominance of the person proposing actions that lead to these outcomes. A dominant person is less susceptible to a conflict-initiated injury than a person of lower dominance. Further, dominant people are less reliant on others to obtain resources

because of their own capabilities. Indeed, evidence suggests that less dominant men are more perceptive of phenotypic dominance cues (e.g., a wider jawbone or more prominent brow) in other men (Watkins, Jones, & DeBruine, 2010; Watkins, Fraccaro, Smith, Vukovic, Feinberg, & DeBruine, 2010). Overall, one's own dominance appears to affect the perceptual sensitivity of phenotypic cues of fitness in others that have the potential to initiate and dominate during conflict. Noticing dominance in others becomes more critical the less one has it.

However, such phenotypic cues that indicate the possibility of increased conflict due to proclivities toward beneficence in a potential persuasive source (i.e., facial masculinity or similarity to oneself) may have different effects when combined with verbal content that indicates the goodwill of the source. Here I define such communication as the expressed intentions of well-being from a source to the recipients of the persuasive message. A source may communicate altruistic intent, emphasizing that targets should engage in the advocated action for their own benefit, or a source may communicate self-interest, emphasizing that targets should engage in the advocate action in order to aid the source. In short, sources can argue for attitude change for their own sake or for the sake of the message recipients. Such verbal cues to a source's intentions should change how people react to nonverbal source cues. For example, a source with masculine characteristics would elicit more submissive behavior (here, attitude change) in a less dominant person when there was greater probability of subsequent conflict due to attitude obstinacy. When a masculine source communicates goodwill toward a less dominant recipient, the recipient should be more likely to disregard, and therefore be less persuaded by, potential threatening

phenotypic cues because of the added declaration of good intent. However, when a masculine source does not communicate goodwill toward a person with low dominance and instead emphasizes his own well-being to the exclusion of others' well-being, the threat of potential conflict would increase the likelihood of a person aligning one's attitudes with that of the source. Simply put, situations in which less dominant people think that a source had their best interests in mind would be less persuaded by dominance cues in a source.

People low in dominance would react differently to a persuasive source who does not possess physical cues that indicates a higher degree of fitness. Due to the decreased potential of an unfit source being able to exert dominance or harm in a potential conflict, a person low in dominance will react to communications of goodwill in the opposite manner: Messages given by sources who lack fitness-signaling cues will be more persuasive when they indicate beneficence toward targets of persuasion and less persuasive when they do not indicate beneficence toward the targets.

On its face, this analysis implies that communication of goodwill serves as a cue to persuasion in some situations (i.e., when less dominant people receive a message from a source lacking cues to fitness) and a cue to nonpersuasion in others (i.e., when less dominant people receive a message from a source possessing cues to fitness). This interaction appears to contradict the main effect for goodwill on persuasion among people who are low in dominance. However, a graph of this prediction (see the upper part of Figure 2.1) shows how a main effect for communicated goodwill can exist for people low in dominance simultaneously with

the hypothesized interaction. Therefore, this prediction is not inconsistent with the idea that communicated goodwill enhances persuasion. Instead of framing the interaction such that messages of goodwill hinder persuasion for sources with fitness cues, perhaps a better way of framing this prediction is that fitness cues enhance persuasion for sources who give selfish messages.

Highly dominant individuals should react differently. Due to a greater insensitivity of threatening physical cues in others, recipients with greater dominance will be persuaded by a source regardless of threatening physical cues. In particular, dominant people will experience less persuasion from self-interested (i.e., selfish) sources than target-interested (i.e., selfless) sources, regardless of the physical cues to fitness possessed by those giving the message. However, because they may be less threatened by potential selfishness in others, the relative decrease in persuasiveness from an other-benefited source compared to a self-benefited source would be smaller than for a person low in dominance who is exposed to a fitness-absent source. Further, more dominant people are less persuaded in general compared to less dominant people.

Given this logic, I hypothesize persuasion to be affected by a three-way interaction between a source's physical cues (in the form of attractiveness, dominance, and dissimilarity), the source's communication of beneficence toward recipients, and the dominance of message targets. In particular, the following predictions are made (and formally presented for each source characteristic in the ensuing sections): First, people low in dominance are more persuaded when a source who possesses cues to fitness communicates selfishness rather than selflessness.

Second, people low in dominance are more persuaded when a source who does not possess cues to fitness communicates selflessness rather than selfishness. Third, people high in dominance are less persuaded by sources who are selfish rather than selfless regardless of the sources' cues to fitness. Finally, people high in dominance experience less overall persuasion compared to people low in dominance. This interaction is depicted in Figure 2.1.

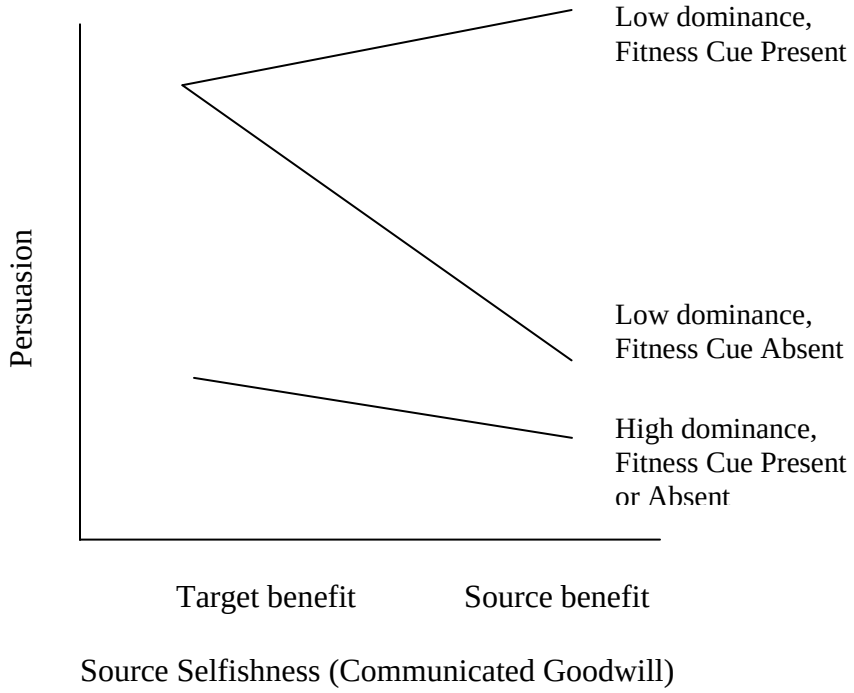


Figure 2.1. Expected three-way interaction between source fitness cue, communicated recipient of goodwill, and recipient dominance.

Specific Hypotheses

The following analysis will explore research related to source characteristics that affect persuasion and show how people who were persuaded by individuals with these characteristics experienced evolutionary advantages that those who remained

unconvinced did not receive. In general, it is suggested that people who were persuaded by physically capable and benevolent sources of social influence were more likely to benefit in the environment of evolutionary adaptiveness, and certain targets who were persuaded by people with these qualities passed their adaptive persuasibility to their offspring. That is, people's tendency to be persuaded by sources who possess cues to credibility in the environment of evolutionary adaptiveness (i.e., physical attractiveness, masculinity, and similarity) acts as evolved psychological mechanism.

Physical Attractiveness

> Beauty is a greater recommendation than any letter of introduction.(Aristotle, as cited in Ohanian, 1991, p. 47)

Remarkable consistencies in the characteristics that humans find physically attractive are found regardless of culture (Buss, 1989). It is thought that humans' preferences for what they deem attractive are the result of evolutionary adaptation to increase reproductive fitness. For example, facial symmetry indicates genetic vigor (Trivers, Manning, Thornhill, Singh, & McGuire, 1999), and therefore humans perceive symmetrical faces as attractive (Langlois et al., 2000). Attraction to body shapes is also thought to have a genetic component. A waist-to-hip ratio of 0.70 in women (Singh, 1993) and body symmetry in both women and men (Gangestad & Thornhill, 1997) are perceived to be attractive, and these body shapes are biologically linked to increased fertility (Baxter & Bellis, 1993; Thornhill, Gangestad, & Comer, 1995).

Humans find certain physical attributes attractive because these attributes are

associated with qualities that ensure more successful reproduction. People who were physically attracted to, and thereby mated with, others who possessed qualities linked with reproductive fitness had relatively more surviving children. These children also had similar tendencies to be attracted to qualities indicative of reproductive fitness, which aided in their own success. Thus, the proclivity to be physically attracted to people who were genetically fit diffused through the human population. Simply put, people evolved to be attracted to successful others. Though cultural and historical factors certainly play a role, physical attraction is explained by our genes.

Physical attractiveness has been consistently found to influence a source's ability to persuade. Attractive faces (as judged by third-party raters) elicit more perceived trustworthiness, expertise, and liking such that a positive monotonic relationship has been found to exist between attractiveness and these three credibility dimensions (Patzer, 1983). Attractive children exert more interpersonal influence on opposite sex peers (Dion & Stein, 1976). Attractive communicators, spokespeople, and advertising models persuade better (Chaiken, 1979; Debevec, Madden, & Kernan, 1986; Eagly & Chaiken, 1975; Kahle & Homer, 1985; Pallak, 1983), are considered to have greater expertise (Horai et al., 1974), are thought to be more intelligent (Eagly, Ashmore, Makhijani, & Longo, 1991), and are liked better (Snyder & Rothbart, 1971) than their unattractive counterparts. People express greater liking for messages (Baker & Churchill, 1977) and spend more time processing persuasive messages given by attractive sources than less attractive ones (DeBono & Harnish, 1988; Puckett, Petty, Cacioppo, & Fisher, 1983). Physical attractiveness especially enhances attitude change when the source is otherwise lacking in expertise (Joseph,

1977) or trustworthiness (Mills & Aronson, 1965). Such attributions made toward sources and their messages have been shown to increase their persuasiveness.

This evidence suggests that attributions of credibility are a function of the attractiveness of the source. That such attributions are also known to affect persuasion suggests that they may mediate the effect of attractiveness on persuasion. That is, the ascription of credibility (and other positive qualities) to an attractive source subsequently increases that source's persuasiveness. More to the point, facial attractiveness has been shown to increase persuasion even when the source is not recognized as having greater expertise or trustworthiness, showing that attractiveness influences persuasion without perceptual acknowledgement of credibility (Praxmarer & Rossiter, 2009). Here it appears that attractiveness has a direct effect on persuasion independently of perceptions of credibility.

A meta-analysis of 83 studies of source attraction found that physical attractiveness accounts for 6.3% of the variance in persuasion (Wilson & Sherrell, 1993). Physical attractiveness is so engrained in the persuasive ability of sources that it has even been characterized as a dimension of credibility (Ohanian, 1990). Attractive sources are simply more persuasive.

Evolutionary psychology can account for why attractive sources are more persuasive. Rhodes' (2006) review of facial attractiveness suggested that beautiful faces are characterized by averageness—possessing the "mathematically average trait values of a population" (p. 202)—symmetry, and sexual dimorphism (i.e., males' possession of masculine physical characteristics and females' possession of feminine physical characteristics). She noted that attractive faces with these qualities are more

indicative of general biological health, better immune function, longevity, physical fitness, and, for males, sperm quality. Facial attractiveness has also been shown to be positively related to actual intelligence (Zebrowitz & Rhodes, 2004).

It is clear that attractive faces are indicative of genetic fitness. Because they were more physically and intellectually capable, attractive people would have been able to obtain more resources and been more successful procreators. Therefore, positive attributions toward and association with attractive people would be adaptive (Langlois, Kalakanis, Rubenstein, Larons, Hallam, & Smoot, 2000).

In humans' environment of evolutionary adaptiveness, individuals in need of coordinated hunting and defense efforts would have benefited from trusting individuals who were physically and intellectually skilled at hunting and capable of organizing other hunters. That is, individuals with actual expertise in hunting would need adept bodies and sharp minds. The same is true to defend successfully against attacking outgroups (Alexander, 1987), which was common among our human ancestors (Wrangham & Peterson, 1996). It would benefit fellow group members, specifically those who were not able to acquire or defend resources on their own (i.e., those low in dominance), to be persuaded by an attractive individual because following this person's direction would result in increased resources and longevity for themselves and their offspring. In the environment of evolutionary adaptiveness, being persuaded to follow advocated action by individuals who are, on average, less physically fit or smart (i.e., more physically unattractive) while on the hunt or during intergroup conflict would result in less food or increased mortality and, therefore, less reproduction. Thus, the tendency to be persuaded by physically attractive individuals

would spread through a human population, especially among those who are less dominant.

Symmetry acts as a marker of phenotypic and genetic quality (Perrett, Burt, Pento-Voak, Lee, Rowland, & Edwards, 1999). Facial symmetry results from healthful embryonic development stemming from a mother's good genes and access to sufficient nutrition. Facially symmetrical people had more successful parents who provided a more advantageous developmental environment. Faces that were more symmetrical were more genetically fit, and therefore, people perceived symmetry in others as more attractive.

Because symmetry serves as the primary marker of facial attractiveness, it will be the focus of this investigation. With this in mind, the following hypothesis is made about how physical attractiveness affects persuasion in conjunction with communicated goodwill and the targets' own dominance:

> H1: (a) When less dominant people are exposed to a facially symmetrical source, those in the source benefit message condition more persuaded compared to those in the target benefit message condition.
>
> (b) When less dominant people are exposed to a facially asymmetrical source, those in the target benefit message condition are more persuaded compared to those in the source benefit message condition.
>
> (c) More dominant people are more persuaded by target benefit messages than from source benefit messages regardless of the facial symmetry of the source.

Sexual Dimorphism

> For the male, unless constituted in some respect contrary to nature, is by

nature more expert at leading than the female. (Aristotle, 1984, 1259a41-a43, p. 52)

A number of studies indicate that persuasibility is affected by the biological sex of a source: Men have a slight advantage in persuasiveness when compared to women. In general, men are more persuasive than women, and women are more persuasible than men (Burgoon & Klingle, 1998). Goldberg's (1968) famous study showed that "John McKay" was more persuasive than "Joan McKay" when attributed as the source of an essay. A recent study confirms Goldberg's finding with participants judging male blog authors as more credible than female blog authors (Armstrong & McAdams, 2009). Male leaders in organizations are also evaluated more positively than female leaders (Eagly, Makhijani, & Klonsky, 1992). One meta-analysis concluded that there is a significant tendency (r = .16) for males to be more persuasive than females across situations and topics (Eagly & Carli, 1981), and other meta-analyses concur with this finding (Becker, 1986; Swim, Borgida, Maruyama, & Myers, 1989). More recent comprehensive reviews also determined that males are generally more persuasive than females (Carli, 2001, 2004).

Evolutionary theory accounts for the various findings of sex effects on persuasion as it applies to leadership (i.e., the ability to influence others to contribute toward group goals and coordinate goal pursuit; Van Vugt, Hogan, & Kiaser, 2008). Because the maintenance of social support within groups allows a mother raising children to benefit from the collective efforts of child rearing (Taylor, Klein, Lewis, & Gruenewalk, 2000), it is likely that women evolved to preserve harmony within groups (Van Vugt, Hogan, & Kaiser, 2008). Conversely, men's resources were better

spent in organizing coalitions to hunt and conquer other groups, because this provided access to additional resources and to female mating partners, so they evolved to adopt leadership roles during intergroup conflicts (Van Vugt, De Cremer, & Janssen, 2007). Males show more risk taking activity (Wilson & Daly, 1985) and greater upper-body strength and spatial-rotation ability (Silverman & Eals, 1992) compared to women, and these adaptations allow them to be more competent hunters and warriors. Indeed, Van Vugt and Spisak (2008) found that women are more likely to adopt leadership roles in intragroup conflict, whereas men were more likely to adopt leadership roles in intergroup competition. These findings are in line with other research about how the appropriateness with which people perceive men and women in leadership roles (Eagly & Karau, 1991).

The evolutionary advantage of followership is more puzzling because followers necessarily forfeit prestige and status (Buss, 2005; Henrich & Gil-White, 2001). Scholars generally assume that early humans adopted followership roles because the relative benefits of following outweighed the risks of competing for leadership roles (Van Vugt & De Cremer, 1999; Van Vugt, Hogan, & Kaiser, 2008). Van Vugt and Spisak (2008) go as far as to say that situational differences activate different evolved decision rules for followership (e.g., "when at war, follow a masculine-looking leader," p. 857). Although leadership styles differ by sexes according to situational differences, followership styles do not. It follows that both male and female followers defer to respective leadership styles for each sex in the situations in which they were adaptive. For example, it was adaptive for both females and less masculine males to follow a more masculine male in situations that might

elicit resources and intergroup competition. Following the fittest leader would result in greater access to resources for lesser fit group members, regardless of their sex.

The focus of this research is not to compare the relative persuasiveness of sources of the different sexes. The previous effects of sex are interpreted according to relative sexual dimorphism of a male source. I argue that sexual dimorphism—the deviation in phenotypic characteristics between females and males—affects the persuasiveness of a male source. Masculine characteristics include enlarged jaws and chins, which indicate greater testosterone levels (Enlow, 1990), better immune function (Folstad & Karter, 1992), and increased strength and fighting ability (Sell et al., 2009). Due to these increased markers of genetic success, masculine males are generally considered more attractive (Cunningham et al. 1990; Grammer & Thornhill, 1994). However, exceptions to the positive association between attraction and facial masculinity exist (Berry & McArthur, 1985; Perrett et al., 1998; Penton-Voak et al., 1999), suggesting that judgments of attractiveness, and ensuing persuasion, may differ according to qualities of those making them. For example, masculine facial characteristics have been associated with higher dominance, less honesty, and lower warmth (Perrett et al., 1998). Among less masculine and more feminine individuals, more masculine males are preferred over males with a more feminine appearance (Johnston, Hagel, Franklin, Fink, & Grammer, 2001; Welling, Singh, Puts, Jones, & Burriss, 2013). These findings are consistent with other research that found that more dominant people are less perceptive about dominant characteristics in other males' faces (Watkins, Jones, & DeBruine, 2010).

Given this analysis, I posit that more masculine, versus more feminine, male

faces elicit persuasion according to the aforementioned interaction:

H2: (a) When less dominant people are exposed to a source's masculine face, those in the source benefit message condition are more persuaded compared to those in the target benefit message condition.

(b) When less dominant people are exposed to a source's feminine face, those in the target benefit message condition are more persuaded compared to those in the source benefit message condition.

(c) More dominant people are more persuaded by target benefit messages than from source benefit messages regardless of the sexual dimorphism of the source's face.

Sexual dimorphism also is manifested in vocal characteristics. In particular, pitch of voice serves as an indicator of physical fitness. Substantial evidence suggests that humans have adapted to assess the physical qualities of men based on hearing their voices (Sell et al., 2010). Deeper voices of men elicit perceptions of greater dominance (Puts, Hodges, Cardenas, & Gaulin, 2007) and larger body size of the speaker (Evans, Neave, & Wakelin, 2006). Consequently, men with deeper voices are generally preferred to men with higher voices (Puts, 2005; Feinberg et al., 2008). These preferences may translate to situations of interpersonal influence. For example, Tigue et al. (2012) found that lower voices are more likely to elicit voting for a male candidate, although their study did not include measures of attitude, source credibility, or message quality. Finally, consistent with findings regarding dominant men's inability to distinguish dominant cues in other men's faces, taller men are less sensitive to vocal cues in other men (Watkins et al., 2010). These studies lead to

additional hypotheses about dimorphism, regarding how the depth of voice of a source affects a source's ability to persuade:

H3: (a) When less dominant people are exposed to a source with a deep voice, those in the source benefit message condition are more persuaded compared to those in the target benefit message condition.

(b) When less dominant people are exposed to a source with a high voice, those in the target benefit message condition are more persuaded compared to those in the source benefit message condition.

(c) More dominant people are more persuaded by target benefit messages than from source benefit messages regardless of the pitch of the source's voice.

Similarity

For the friend is . . . a second self. (Aristotle, 1925, l. 1213a)

A source's ability to persuade is partly a function of the similarity of the source to the receiver. A number of studies have shown that the more similar the source is to targets of persuasion, the better the source is able to change others' attitudes and behaviors (e.g., Bercheid, 1966; Brock, 1965; Feldman, 1984; McCroskey, Richmond, & Daly, 1975; McGuire, 1969). These results are striking in regard to racial similarity, with people generally perceiving a source of their own race as more credible (Coleman, Wampold, & Casali, 1995; Miller, 1975; Walker, Field, & Files, Armenakis & Bernerth, 2009), especially when they report being highly ethnocentric (Arpan, 2002; Neuliep, Hintz, & McCroskey, 2005). This evidence suggests that similarity acts as a persuasive cue, especially when the cognitive processing of arguments is minimal (Petty & Wegener, 1998). One meta-analysis of

60 studies found that similarity explains 8.6% of the variance in persuasion (Wilson & Sherrell, 1993).

A comprehensive review of similarity in credibility research distinguished between two types of similarity that affect attitude change (Simons, Berkowitz, & Moyer, 1970). *Attitudinal similarity* refers to the correspondence of a source's expressed values, beliefs, and attitudes, whereas *membership-group similarity* refers to the sharing of demographic and other "readily observable characteristics" (Simons et al., p. 2). These two forms of similarity obviously overlap—members of groups often share similar attitudes—and have evolutionary implications as to how persuasive targets perceive the credibility of a source. Minnick (1957) went so far as to say that a speaker who shares "identity in origin and parentage" with an audience possesses a greater potential to affect attitude change (p. 126).

Perceiving similar others as more credible than dissimilar others has an obvious relationship to genetics. When behavior is motivated by the desire to pass along genes successfully, individuals would benefit by increasing the fitness not only of their immediate offspring, but of others with whom they shared genetic material (Rushton, 1989). That is, it would benefit the individual to show preferential treatment toward kin.

This idea has been explored by evolutionary theorists with varying degrees of specificity. Genetic similarity theory (Rushton, Russell, & Wells, 1984) most broadly describes the reasons why detection of shared genetic material in others and treating these individuals with altruism is adaptive. Kin selection theory posits that individuals maximize their own genetic fitness by identifying and then contributing to the success

of related offspring (Hamilton, 1964). These theories have been used as a rationale for the existence of ethnic nepotism, as people are driven to surround themselves with others with whom they are related (Rushton, 2005). Individuals within the same ethnic group are generally more likely to share genetic material than individuals of differing ethnicities (Rushton et al., 1984).

By considering kin selection, one can see how similarity influenced persuasion. Individuals increased their own genetic fitness by showing altruism to genetically related others. The inverse proposition would follow: Recipients of altruism from kin increase their own fitness by accepting assistance and resources from genetically related others. That is, as altruistic behavior toward kin evolved, so did the willingness to receive altruistic behavior from kin. Because kin behaved in ways that benefit their relatives more than nonrelatives, apparent altruism from nonkin would likely be deemed as less credible by the recipient of the behavior. After all, apparent altruistic behavior from nonkin may turn out to not be altruistic. This reasoning accounts for the additional dimension of goodwill that has been shown to reflect a dimension of source credibility (McCroskey & Teven, 1999). Failure to trust kin or perceptions of trust in nonkin would result in access to fewer resources, thereby decreasing reproductive fitness. Thus, perceiving genetically related (i.e., similar) sources as credible would be subject to selection pressure.

Facial morphing research demonstrates that perceived genetic similarity does lead to higher levels of altruistic perceptions. DeBruine and colleagues have suggested that preferences for similar faces have an evolutionary component. When people view a photograph of another human face that had been previously merged

with an unrecognizable amount of a picture of their own face, phenotypic matching is subliminally activated. When such cues to kinship occur, people show increased liking toward (DeBruine, 2004), cooperation with (Krupp, DeBruine, & Barclay, 2008), and trust of (DeBruine, 2002) the other. Further, when a source shares facial characteristics with an audience, audience members report increased liking for the commercial brand advocated by that source (Faber, Brittany, Duff, & Lutchyn, 2006). Independent and undecided voters are more likely to prefer a political candidate when his or her face had been photographically merged with an unrecognizable amount of the voters' (Bailenson, Iyengar, Yee, & Collins, 2008). In short, facial similarity appears to be linked with perceptions of credibility and persuasion in sources of social influence (cf. Lutchyn, Duff, Faber, Cho, & Huh, 2009).

A number of credibility studies regarding attitudinal similarity and in-group versus out-group membership can be re-interpreted in light of kinship selection. For example: credibility is enhanced when a source is perceived as having similar attitudes or interests as the targets of persuasion (Busch & Wilson, 1976; Woodside & Davenport, 1974); people with similar names to message targets elicit greater compliance and liking (Garner, 2005); and people seem to consider more seriously a majority group (Baker & Petty, 1994; Mackie, 1987; Trost, Maass, & Kenrick, 1992) or ingroup (Mackie, Worth, & Asuncion, 1990) member's arguments. Each of these findings makes sense in light of evolutionary psychology.

For these findings to make evolutionary sense, it is important to distinguish how adaptive characteristics in the environment of evolutionary adaptiveness function differently in present society, which is merely a blip in human evolutionary history

(Irons, 1998). Similarity preference evolved in kinship social networks when groups comprised related individuals. That is, in the vast majority of human history, group membership indicated genetic relatedness. Currently, similarities such as group membership do not equate to kinship, although our evolved psychological mechanism for similarity functions as though it does. For instance, college students are inclined to put greater trust in another who hails from the same university (Mackie, Worth, & Asuncion, 1990), even though individuals do not have reason to care about the well-being of their offspring. Attitude similarity even acts as a cue for people to treat others as if they had kinships ties (Park & Schaller, 2004). Such is the difference between proximate (i.e., the immediate and contemporary reason) and ultimate (i.e., the evolutionary advantageous reason) explanations of discrimination against dissimilar persons. In short, humans should be more susceptible to influence from a person whom they deem to be a part of their family or tribe, because this tendency led to adaptive attitude change. A hypothesis about facial similarity as an evolved psychological mechanism that enhances persuasiveness of a source is proposed in light of these arguments:

H4: (a) When less dominant people are exposed to a similar source, those in the source benefit message condition are more persuaded compared to those in the target benefit message condition.

(b) When less dominant people are exposed to a dissimilar source, those in the target benefit message condition are more persuaded compared to those in the source benefit message condition.

(c) More dominant people are more persuaded by target benefit messages than

from source benefit messages regardless of the similarity of the source.

Modeling the Effect of Source Cues on Persuasibility

A fundamental question that arises from the previous analysis is whether source characteristics affect persuasion through cognition. Persuasion can operate below a person's level of awareness (Roloff, 1980), especially when persuasive stimuli are nonverbal (Argyle, 1975). The current research will assess whether targets of persuasion are affected by source characteristics independent of their attributions due to these characteristics. That is, do source and message attributions that have been shown to positively associate with persuasion (e.g., source credibility, source attractiveness, perceived message quality) mediate the relationship between sources' features and the persuasion they elicit?

If susceptibility to influence has evolutionary origins, it seems possible that perceptions of source characteristics influence targets of persuasion independently of their attributions about the source or message. As an example, research has shown that a source's facial attractiveness leads to greater target attitude change even when the targets do not judge the source to be more credible (Praxmarer & Rossiter, 2009). Zajonc (1980) showed that affective reactions to stimuli can occur independently of cognition. That is, it is possible for people to develop preferences for a stimulus without also developing inferences about why they prefer it. Other research has confirmed the finding that affective change does not require associated cognitive change (E. L. Fink, Monahan, & Kaplowitz, 1989).

A structural model is proposed to test the process by which source characteristics influence persuasion. This model will assess the role of attributions

toward persuasive source characteristics in affecting attitudes by entering appraisals of the source and message (e.g., source credibility and message quality) as partial mediators of the effect of source characteristics on attitudes. This model allows for several possibilities. First, full mediation may occur, whereby cognitive attributions of sources influence source characteristics and subsequently influence attitude change without a direct effect of the characteristic itself. Here, the effect of a source characteristic is dependent on how it was assessed by the targets of persuasion. The presence of mediation would suggest that the proposed evolutionary psychological mechanism of social influence does not influence attitude formation. For instance, it is possible for the effect of facial symmetry on attitude to be mediated by positive affect experienced after a message or liking for a source. Such an effect would not support persuasibility as an adaptation, but instead merely suggest that general preference for symmetry has evolved, and persuasion occurs due to this preference. Full mediation does not disqualify evolution as a mechanism behind why source characteristics affect attitude change, but it does disqualify the explanation of persuasibility as that evolved mechanism.

Second, cognitive appraisals of sources may act as partial mediators of the effect of source characteristics on persuasion. That is, a direct path from a source characteristic to attitude may be found. Such a result would provide strong support for an evolutionary explanation , because source characteristics would influence attitude directly without the ascription of positive qualities to the source and message. Here, the source characteristic affects attitude independently of cognitive or affective reactions to it.

A third possibility treats cognitive appraisal of source characteristics as epiphenomenal. Here, appraisals are made based on source characteristics, but these attributions do not significantly affect attitude. Instead, source characteristics directly affect persuasion. This possibility would also support persuasibility as an adaptation. Figure 2.2 shows which paths are expected to be significant based on these possibilities.

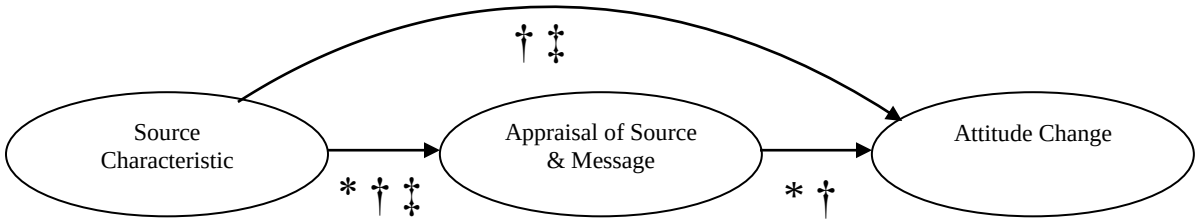


Figure 2.2. Proposed model to test the effects of source characteristics and source appraisals on attitude change.
Note. * indicates significant paths for full mediation of appraisals. † indicates significant paths for partial mediation of appraisals ‡ indicates significant paths for epiphenomenal effect of characteristics on appraisals.

A number of variables known to relate to persuasion will serve as appraisals of the source and message. Variables measured in the following studies include those that assess the source characteristics of interest, other cognitive attributions related to the source and message, and affective responses to the source and message. These variables will serve as secondary outcome variables in addition to measured attitude for analysis of covariance (ANCOVA) tests. The majority of them will be proposed as possible mediators between source characteristic and attitude in structural equation models. Although the specific results will be reported in detail in subsequent chapter, the variables will be presently discussed.

First, variables that assess perceptions of the aforementioned source characteristics (Pompitakpan, 2004) will be measured. Perceived interpersonal attractiveness will be assessed across three aspects: social, physical, and task attraction (McCroskey & McCain, 1974). *Social attraction* refers to desirability of a person's personality; *physical attraction* refers to preference for a person's physical features; and *task attraction* refers to the expected ease and value of working with a person. As previously shown, source attractiveness aids in persuasion. Perceived similarity will be assessed to account for target's perceived relative likeness toward the source. As previously discussed, this variable is also linked to persuasion. Finally, for the studies in which dimorphism is of interest, perceived source dominance will be assessed. Although source dominance itself has not been studied in regard to persuasion, this variable will capture the relative masculinity that message recipients ascribe to the source.

In addition, variables that measure attributions toward the source and message will be measured. Source credibility, made up of competence, goodwill, and trustworthiness (McCroskey & Teven, 1999), will serve as the measure for the recipients' appraisal of the source. In addition to source attributions, message attributions are also of interest because of their connection to persuasion. Perceived message quality—the strength of arguments—will be evaluated, as it has been shown to be a cause of the actual persuasiveness of a message (Dillard, Shen, & Grillova Vail, 2007). Two other variables shown to be linked to persuasion will be assessed. *Message realism*—the degree to which a person envisions the message as representative of typical messages (Pinkleton, Austin, Van de Vord, 2010)—is

associated with persuasive sources (Carbone, 1975). *Issue importance*—the arousal of one's commitment on or ego-involvement with an issue (Sherif, Sherif, & Nebergall, 1965)—is linked to trust in messages (Gunther & Lasorsa, 1986) and overall message effectiveness (Petty & Cacioppo, 1983). Whereas the effects of source characteristics on the latter two variables are of interest—these variables will be assessed by ANCOVAs to determine whether source cues affect them—these concepts typically are not treated as mediators of message exposure and attitude change and will therefore not be included in the mediation model. Thus, perceptions of credibility of the source and quality of the message will serve as the attributions recipients make, which will be modeled as mediators.

Finally, it is also possible that affective responses from message targets increase persuasion. Liking for the source (Patzer, 1983) and the message (Baker & Churchill, 1977) have been shown to be linked to persuasion. Thus, source liking and positive affect in response to the message will act as emotional appraisals that serve as potential outcomes of exposure to source characteristics and mediators of characteristics' influence on attitude.

Summary of Principles Relating to Evolutionary Theory and Source Persuasiveness

An evolutionary explanation has been presented to account for why sources with certain characteristics are more persuasive. Following the evolutionary psychology paradigm, persuasion research was interpreted in light of how the tendency to be influenced by certain sources would increase people's genetic fitness. Three main characteristics that have been found to affect source credibility were

theorized to result from a process of individual selection: physical attractiveness in the form of facial symmetry (H1), biological sex in the form of facial sexual dimorphism (H2) and voice pitch (H3), and similarity to message targets (H4). Predictions that communicated beneficence and target dominance interact with source characteristics were proposed to test the evolutionary explanation of interpersonal influence.

Using evolutionary theory to account for why source characteristics affect persuasion has ethical implications. Three main points must be considered. First, though evolutionary theory suggests that there is some natural inclination towards perceiving attractive people, similar people, and men as credible, the theory does not suggest that these proclivities are socially just. For example, perceiving individuals as more credible based on their physical characteristics highlights an unequal advantage that some have over others. However, explaining this bias should not be conflated with advocating it. Koerner and Floyd (2010) highlighted the necessity to avoid the naturalistic fallacy when using evolutionary accounts of human communication when they state that "calling something *natural* does not imply that it is *good*" (emphasis in original, p. 40).

Second, recognizing the difference between the environment of evolutionary adaptiveness and today's environment also allows one to see how evolutionary tendencies that influenced certain people in the past may not currently function as adaptive. Although I theorize that humans once benefitted from perceiving certain individuals as more persuasive in the environment of evolutionary adaptiveness, this observation does not imply that humanity still benefits from being persuaded by

individuals with those qualities. For example, one would be hard pressed to make a coherent argument for why college students should only take classes from physically attractive professors because they are more expert and trustworthy than less attractive professors. Perceptions of credibility based on physical characteristics do not necessarily equate with actual competence, trustworthiness, or good intentions in today's environment.

However, the ability to account for seemingly irrational social behavior that sometimes works to humans' detriment is also a major benefit of the evolutionary approach. An evolutionary lens allows us to explain why humans tend to be persuaded by certain individuals who might not have their best interests in mind (i.e., maladaptive susceptibility to influence) by taking into consideration a time when the behavior functioned adaptively. Indeed, "selected features often cease having the fitness-enhancing effects that got them selected in the first place" (Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998, p. 540). Just as humans' preference for fatty foods can now detrimentally lead to obesity, humans' tendency to be persuaded by attractive sources who wish to take advantage of others can now detrimentally lead to unwanted persuasion.

Finally, acknowledging the impact of evolution on perceptions of credibility does not negate the importance of culture and learning in these perceptions. Social influences like culture and media undoubtedly have an impact on the characteristics of sources that facilitate persuasion. The present research is not intended to negate the effects of culture on susceptibility to influence or to argue that such effects are not important. Rather, this research aims to identify whether people's tendency to be

persuaded by sources with certain characteristics can be partly explained by trait-like predispositions.

This analysis provides an inclusive explanation as to why people are persuaded by sources with certain characteristics. This approach benefits the field of communication by establishing a framework by which persuasion studies can be understood in relation to one another. It applies a theoretical explanation to a previously haphazard variable-analytic list of findings about persuasive source effects. Further, an evolutionary explanation for social influence goes beyond tying together existing studies regarding persuasibility and attractiveness, sex, and similarity by providing a mechanism to further hypothesize other source characteristics that affect the persuasiveness of messages in a variety of topics and contexts. This research contributes to the growing body of evidence that human social cognition, communication, and behavior stems from evolutionary origins (Dunbar, 1996; Miller, 2009; Miller & Kanazawa, 2007).

Chapter 3: Pilot Study

This chapter details the pilot study that preceded the experimental studies. The purpose of the pilot study was twofold: to pretest messages in order to determine successful manipulations of a source's communicated goodwill or beneficence (i.e., benefit frame) and to assess the reliability and dimensionality of measures included in the experimental studies. The pilot study and subsequent experiments were approved by the Institutional Review Board at the University of Maryland (UMD).

Method

Message Development

A pilot study was conducted in order to identify messages with effective manipulations of perceived source and target benefit. Messages that were found to be most successfully manipulated (i.e., those that resulted in stronger effect size relating the manipulation to the manipulation check) were subsequently used in the main experimental studies. Messages were designed to elicit high and low perceived benefit to the source or to the recipients of the message. In order to elicit these perceptions, message topics were identified that had the potential to be interpreted as beneficial to both the speaker (i.e., an alleged UMD student) and to the targets of the messages (i.e., undergraduate students at UMD). Thus, these messages included topics related to controversial university policies (e.g., price of parking, general education requirements, and attendance policies) that could be framed such that the reasons to align with the advocated position would be perceived as beneficial to the source or to the target of the message, thereby eliciting greater or lesser perceptions

of source selfishness.

This manipulation, hereafter referred to as *benefit frame*, was accomplished in two ways. First, the source's situation relative to the university policy was manipulated within the message so that the source would or would not tangibly benefit from the advocated position in the message. For example, one message advocated the elimination of the distributive studies requirement in the general education curriculum, and the source either had yet to fulfill the requirement (thereby benefiting from a policy change) or had already fulfilled the requirement (thereby not benefiting from a policy change). Second, language throughout the message varied to highlight the recipient of the benefit from the advocated position (e.g., "This change definitely *would/would not* help me," "Do *me/yourself* a favor . . . ," and "For the benefit of *my/your* future …"). Besides these small differences in wording and the framing of the sources' situation relative to the policy, the arguments, facts, and sentence structure were consistent across message conditions. These differences between messages were intended to elicit perceptions that the source was advocating a policy change in order to benefit the self or in order to benefit the message recipients. Twenty-one different messages were created with this intended manipulation, resulting in 42 message versions.

Participants

One hundred and three people participated in this study. Most were female (60%), with 28% male and 12% not responding to this item. Participants averaged 20 years of age, ranging from 18 years to 35 years. The sample was 58% White, 11% Asian, and 10% Black or African American, with 7% reporting other racial

backgrounds and 14% not responding to this item. In a separate question, five percent responded as being of Hispanic or Latino descent.

Procedure

Participants were recruited via an online research management system from the Communication Department's participant pool. They were offered a small amount of extra credit to participate in the online survey. After being informed of the nature of the study—an alleged assessment of student speeches given in a UMD oral communication course—participants gave informed consent. They were then randomly assigned to read the messages.

Participants first responded to one message that was selected to pretest scales to be included in the experimental studies. Message 18, which addressed a policy that made students ineligible to attend football games after five game absences, was selected because of its assumed clarity of the manipulation—the source had or had not missed the number of games to become ineligible. Participants were randomly assigned to read the message framed to benefit the source or target of the message and then answered battery of items about the written speech and the source.

After reading Message 18, participants were randomly assigned to one set of remaining messages. Before the study, the twenty message manipulations (i.e., 40 total messages) were randomly assigned to two groups based on benefit frame. Message pairs were assigned to different groups, resulting in two sets of twenty messages with equal numbers of source benefit and target benefit messages. Participants were randomly assigned to one of these two sets, and they then read eleven randomly selected and ordered messages within that set. All participants read a

combination of both self- and target benefit messages, but no one read both versions of the same message. After reading each message, participants responded to manipulation check items that assessed perceived benefit to the source and targets.

Measures

Unless otherwise noted, all questions were assessed on a 1-7 scale (1 = *strongly disagree*, 7 = *strongly agree*). The reliabilities, means, and standard deviations of reoccurring items across studies 1-4 are found in Table 3.1.

Perceived benefit frame. Participants responded to eighteen items assessing the relative benefit brought about by the advocated action to the *source*, *participant* (i.e., the message target), and *the average UMD student* (i.e., relevant third parties). Six similarly worded items were assessed for each recipient of benefit (e.g., "The speaker has *his* [*my/the average UMD student's*] well-being in mind" and "The speaker cares about how *he* [*I/the average UMD student*] will benefit from this issue").

The following items were only assessed for Message 18.

Likability. Reysen's (2005) likability scale assessed perceived likability of the source. The scale consisted of eight items (e.g., "This person is likeable" and "This person is warm").

Attraction. Interpersonal attraction is typically assessed along three dimensions (McCroskey & McCain, 1974). Because no source characteristics were presented independently of the messages, physical attraction was not assessed in the pretest. Instead, six items measured social attraction (e.g., "I think he could be a friend of mine" and "He would be pleasant to be with").

Table 3.1.

Measurement Characteristics of Piloted Scales for Message 18.

Variable	Number of items	Cronbach's α	Number of Components	Eigenvalue (Number of loaded items)	% of Explained Variance	Action	α after change
Perceived source benefit	6	.92	1	4.29	71.43	Remove 2 items	.94
Perceived target benefit	6	.91	1	4.17	69.55	Remove 2 items	.90
Perceived avg. student benefit	6	.94	1	4.68	77.99	Remove 2 items	.92
Likability	8	.93	2	5.47 (8) 1.05[a]	69.38 13.18		
Social attraction	6	.44	2	3.32 (5) 1.20[a]	55.43 20.05	Remove 1 item	.57
Competence	6	.88	1	3.72	61.92		
Goodwill	6	.89	1	3.91	65.18		
Trustworthiness	6	.92	1	4.28	71.28		
Similarity	4	.97	1	3.63	90.76		
Issue importance	4	.96	1	3.53	88.30		
Message quality	8	.70	2	5.29 (6) 1.15[a]	66.08 14.36		
Message realism	5	.92	1	3.15	63.05		
Attitude, direct	9	.98	1	7.61	84.60		
Attitude, quasi-direct	4	.93	1	3.35	83.64		
Dominance	11	.86	3	4.71 (8) 1.65 (2)[a] 1.12[b]	42.83 14.96 10.17		

Notes. [a]Eigenvalue of second principal component. [b]Eigenvalue of third principal component.

Source credibility. Three validated aspects of source credibility were measured (McCroskey & Teven, 1999) by semantic differential items on seven-point scales. Six items assessed competence (e.g., unintelligent vs. intelligent, inexpert vs. expert, and incompetent vs. competent). Six items assessed goodwill (not self-centered vs. self-centered, insensitive vs. sensitive, and phony vs. genuine). Six items assessed trustworthiness (e.g., "The person who gave this speech seems *dishonest* vs. *honest*, *untrustworthy* vs. *trustworthy*, and *dishonorable* vs. *honorable"*).

Similarity. Four semantic differential items previously used to measure attitude homophily (McCroskey, Richmond, & Daly, 1975) assessed perceived similarity to the speaker. Items were measured on a seven-point scale (e.g., "The person who gave this speech seems unlike me vs. like me [and different from me vs. similar to me]").

Issue importance. Four items assessed the relevance of the speech topics to participants lives (e.g., "The topic of the speech is important to me" and "I care about the issues at hand in this speech").

Message quality. Eight items assessed the perceived suasory strength of the message (e.g., "This message was persuasive" and "This message swayed me").

Message realism. Five items assessed the believability of the message as a speech that would be presented in an oral communication course (e.g., The speech is typical of something that would be given in a public speaking class" and "Realistically, this is the kind of speech I'd expect for this assignment").

Attitude. Attitude was measured in two ways. First, nine semantic differential items, six of which that have been validated (McCroskey & Richmond, 1989),

measured attitude toward the policy addressed in the speech on seven-point scales ("This policy is: *good* vs. *bad*, *harmful* vs. *beneficial*, *fair* vs. *unfair*, and *unfavorable* vs. *favorable*"). Second, participants rated their agreement with four statements about the policy, which differed based on the topic of the speech (e.g., "Students should not be required to take courses to fulfill distributive studies credits"). For some speeches, magnitude scales assessed levels dependent variables associated with attitude change in which participants could respond with any number (e.g., "How many credit hours do you think the distribute studies requirement should be?").

Dominance. Dominance was measured with eleven items (1 = *not at all like me*, 7 = *just like me*) taken from the International Personality Pool (2012). Example items included "I try to outdo others" and "I impose my will on others."

Results

Manipulation Checks

Table 3.2 indicates the results of the three manipulation checks of perceived benefit frame for each message. Perceived benefit to source was successfully manipulated in all twenty-one messages (one-tailed), with the source benefit frame, compared to the target benefit frame, eliciting significantly higher perceptions that the source benefits from the advocated position in the message. These results indicate successful manipulations.

Manipulations were not as successful in eliciting differences in perceived benefits to the target or average UMD student. Perceived benefit to the target was successfully manipulated in nine of the twenty-one messages (one-tailed), with the source benefit frame compared to the target benefit frame, eliciting

Table 3.2

Means Differences and Effect Sizes for Benefit Frame Manipulation Resulting from Independent Samples T-Tests.

		Perceived Benefit to Source					Perceived Benefit to Target					Perceived Benefit to Average Student				
		Source benefit		Target Benefit			Source benefit		Target Benefit			Source benefit		Target Benefit		
	Message Topic	M	(SD)	M	(SD)	*d*	M	(SD)	M	(SD)	*d*	M	(SD)	M	(SD)	*d*
1	Drinking on-campus	5.37	(1.12)	3.37	(1.56)	1.47***	4.49	(1.22)	5.02	(1.30)	-0.42	4.59	(1.20)	5.56	(1.14)	-0.83*
2	To-go eating containers[3]	4.99	(1.08)	2.57	(1.64)	1.74***	4.69	(1.26)	5.13	(1.17)	-0.36	5.31	(0.93)	5.81	(0.84)	-0.56
3	Parking prices[4]	5.97	(0.80)	3.06	(1.73)	2.14***	5.17	(1.14)	5.07	(1.17)	0.09	5.61	(1.11)	5.63	(1.36)	-0.02
4	Legacy scholarships[3]	5.89	(0.96)	3.36	(1.62)	1.90***	3.46	(1.09)	5.29	(1.31)	-1.52***	4.26	(1.22)	5.51	(1.06)	-1.09**
5	Religious observance[2]	5.58	(1.15)	2.51	(1.60)	2.22***	4.75	(1.42)	5.14	(0.89)	-0.32	5.29	(1.05)	5.87	(0.69)	-0.65†
6	Distributive studies requirement[2]	5.96	(1.12)	3.98	(1.75)	1.35***	4.11	(1.56)	4.98	(1.15)	-0.63†	4.47	(1.73)	5.06	(1.15)	-0.40
7	Free STI testing at Health Center[3]	5.74	(1.01)	3.92	(1.21)	1.64***	5.01	(1.19)	5.26	(1.15)	-0.21	5.39	(1.06)	5.74	(0.99)	-0.34
8	Pool tables in student union	5.75	(1.27)	3.92	(1.48)	1.32***	3.56	(1.45)	4.29	(1.18)	-0.56†	4.56	(1.23)	5.04	(0.99)	-0.43
9	More counselors[1]	5.94	(0.97)	3.48	(1.45)	1.99***	4.68	(0.84)	5.06	(1.06)	-0.40	5.17	(1.00)	5.93	(0.97)	-0.77*
10	GPA point assignments	5.84	(1.26)	4.50	(1.72)	0.89***	3.98	(1.51)	5.57	(0.96)	-1.25**	4.24	(1.57)	5.63	(0.95)	-1.06**
11	Rent cap in College Park[2]	5.54	(1.21)	2.93	(1.68)	1.79***	4.40	(1.44)	4.88	(1.04)	-0.38	4.89	(1.31)	5.74	(1.16)	-0.69*
12	Time off for Grad exams	5.58	(1.07)	3.42	(2.00)	1.36***	4.63	(1.36)	4.88	(0.93)	-0.21	5.35	(0.95)	5.64	(1.07)	-0.29
13	Major credit hour equality	4.91	(1.36)	3.59	(1.64)	0.87***	4.45	(1.03)	4.80	(1.23)	-0.31	4.50	(1.08)	5.40	(1.05)	-0.85*
14	Quiet in library	5.79	(1.11)	5.02	(1.32)	0.63†	4.23	(1.21)	4.95	(1.14)	-0.61†	4.49	(0.90)	5.38	(1.07)	-0.90**
15	Extend Good Samaritan Policy[1]	5.10	(1.25)	2.96	(1.40)	1.60***	4.06	(1.32)	4.34	(1.00)	-0.24	5.15	(1.20)	5.61	(0.93)	-0.43
16	Food Trucks on campus	5.58	(1.17)	4.27	(1.42)	1.01**	4.24	(1.33)	4.95	(0.81)	-0.64†	4.50	(1.58)	5.15	(0.92)	-0.50
17	Computer tablet requirement	5.55	(1.27)	4.81	(1.19)	0.60†	3.56	(1.62)	4.28	(1.07)	-0.52†	3.98	(1.27)	4.65	(1.08)	-0.57†
18	Football no show policy[1]	5.70	(0.96)	3.75	(1.29)	1.72***	4.29	(1.32)	5.43	(0.96)	-0.98***	4.84	(1.23)	5.73	(1.05)	-0.78***
19	Taco Bell removal	5.49	(0.97)	4.53	(1.39)	0.76*	4.12	(1.25)	5.02	(0.95)	-0.81*	4.32	(1.50)	5.60	(0.96)	-1.01**
20	Hoff Theater reopening	5.76	(1.02)	4.64	(1.29)	0.97**	4.77	(1.31)	4.48	(1.09)	0.24	5.40	(1.08)	4.78	(1.20)	0.54
21	Balance Speakers Politics	5.54	(1.38)	4.50	(1.32)	0.77*	4.62	(1.50)	5.03	(1.28)	-0.29	4.78	(1.24)	5.23	(1.27)	-0.36

Note. For two-tailed tests, ***$p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$. Superscripts indicate the experiment in which the message was used. Significance values indicate two-tailed tests.

significantly lower perceptions of the target benefiting from the advocated position in the message. Eleven messages successfully manipulated perceived benefit to the average UMD student (one-tailed), with the source benefit frame, compared to the target benefit frame, eliciting significantly lower perceptions that the average UMD student benefits from the advocated position in the message.

Overall, these results suggest that the manipulation of benefit frame successfully altered participants' perceptions of the source's intentions of goodwill. All messages successfully altered perceptions of a source's own self-interest, whereas about half of the messages also created perceptions that the source was biased toward the targets and other beneficiaries (i.e., students) of the message.

Selection of Messages for Experiments

Of the three manipulation checks, the variable considered most relevant to this project's hypotheses was the perceived benefit to source. Due to the consistency by which it was affected by the benefit frame manipulation, this variable was given primary importance when selecting messages for the experiments. Perceived benefit to the target was of secondary importance because this variable shares an assumed theoretical association with perceived benefit to the source, but it did not result in as consistent differences based on the message manipulation. Although the results of the perceived benefit to the average UMD student variable was basically consistent with the perceived benefit to the target, the benefit to the average UMD student was of less theoretical interest and was not strongly considered when selecting messages for the main studies given its seeming redundancy to perceived benefit to the target.

Ten messages were selected for inclusion in the experiments according to the

following process. First, the messages with the strongest effect sizes for perceived benefit to the source were identified. Of these, two of the messages also had significant effects for perceived benefit to the target. Because the relationship between perceived benefit to the source and target appeared to be unrelated in some messages and negatively related in other (see correlations in Table 3.3), the decision was made to include both types of messages in the main experiments.

To select messages for the main experiments, the ten message pairs with the strongest effect sizes for perceived benefit to the source were identified. Out of this list, two message pairs also had significant effects for perceived benefit to the source. However, a third message pair of this kind was necessary in order to include one in all three repeated-measures experiments for consistency. Thus, of the ten selected messages, the message with the weakest effect size was replaced with a message that had the next highest effect size and also had a significant perceived benefit to target manipulation. That is, Message 1 (perceived source benefit $d = 1.47$) was replaced with message 6 (perceived source benefit $d = 1.35$) because the latter message also exhibited a significant manipulation for perceived benefit to the target. This allowed for Experiments 1-3 to each present three messages to participants, with one of these three also having significantly manipulated perceived benefit to the target. Experiment 4, which manipulated participants' facial similarity to the source, only used one message in order to avoid participants' potential detection of their own photograph's digital morph into source photographs due to multiple exposures.

The ten messages were then ordered based on the strength of their effect sizes and whether they had significantly manipulated perceived benefit to the target. To

Table 3.3

Message Selected for Experiments Ordered by Strength of Effect Size of Perceived Source Benefit Manipulation Check.

Message	Topic	*Cohen's d* of Perceived Source Benefit	Significant Manipulation of Perceived Target Benefit	Zero-order Correlation between Perceived Source and Target Benefit	Experiment Assignment
Block 1					
5	Religious observance	2.22	no	.01	2
3	Parking prices	2.14	no	-.10	4
9	More counselors	1.99	no	-.02	1
4	Legacy scholarships	1.90	yes	-.44*	3
Block 2					
11	Rent cap in College Park	1.79	no	-.11	2
2	To-go eating containers	1.74	no	.03	3
18	Football no show policy	1.72	yes	-.38*	1
Block 3					
7	STI testing at Health Center	1.64	no	.05	3
15	Extend Good Samaritan Policy	1.60	no	-.13	1
6	Distributive studies	1.35	yes	-.36*	2

*$p < .05$

evenly distribute the strength of manipulation and presence of a successful perceived target benefit manipulation in subsequent studies, these messages were grouped into blocks from which messages were randomly assigned to experiments (see Table 3.3). Each main study was first randomly assigned one of the three messages that resulted in both successful source and target manipulations. The main studies were then randomly assigned messages from each block to distribute evenly the strength of effect sizes across studies. This procedure resulted in Studies 1-3 each having three messages and Study 4 having one.

Measurement Characteristics and Scale Modifications

Scales utilized to assess Message 18 were subjected to principal component analyses (PCA) to assess dimensionality of variables. The purpose of this analysis was to determine whether items should be excluded from the main studies and to sensitize the researcher to potential measurement issues to expect in the main experiments. Reliability and dimensionality information of scales is reported in Table 3.1.

Some scales were modified for the main experiments due to these results. Two items of each subscale for perceived benefit frame were removed in order to shorten the length of the questionnaire, resulting in four items per subscale. The items that had the lowest component loadings on their relevant subscales were removed. Removal of these items resulted in high reliability and the subscales remained unidimensionality.

In addition, one item was removed from the scale that assessed social attraction because it was the sole item loading on to the second principal component.

Removal of this item created a unidimensional scale and improved the scale's reliability. Despite low reliability in the pilot study, the social attraction scale did not have reliability issues in the main studies. All other items were included in the main studies.

Chapter 4: Background to Main Studies

The purpose of the following experiments was to assess the effects of phenotypic source characteristics and message benefit frame on attitude change. In Experiments 1-3, in which facial symmetry (Experiment 1), facial sexual dimorphism (Experiment 2), and vocal sexual dimorphism (Experiment 3) were manipulated, it was hypothesized that the manipulation of source characteristic and benefit frame would interact with participants' dominance to affect attitude change. In particular, less dominant participants will be better persuaded by more masculine or attractive sources who give source benefit framed messages, whereas they will be more persuaded by less masculine and attractive sources who give target benefit framed messages. Compared to those lower in dominance, participants high in dominance will be less persuaded after reading source benefit frames messages regardless of the source's phenotypic characteristics.

Similarly, in Experiment 4, in which facial similarity was manipulated, an interaction was expected such that less dominant participants in the similar face (i.e., self-morph) condition will be more persuaded by the source benefit message compared to participants in the dissimilar face (i.e., other-morph) condition. Participants high in dominance will be less persuaded after reading source benefit frames messages regardless of the source's similarity.

Common Method

The four studies were alike in experimental design, procedures, and measures. These common methods are detailed below.

Design

Each study experimentally manipulated two independent variables. The first variable, which was manipulated similarly in all studies, was the messages' communicated goodwill toward message recipients (benefit frame: *source benefit* vs. *target benefit*). The second variable, which differed across studies, manipulated the physical characteristics of the message source. This variable had two conditions in the first study (facial symmetry: *symmetrized* vs. *asymmetrical*), second study (facial dimorphism: *masculine* vs. *feminine*), and fourth study (facial similarity: *self-morphed* vs. *other-morphed*). The third study used three levels (voice pitch: *deep* vs. *normal* vs. *high*). Operationalizations of the source characteristic manipulations are described in more detail in the chapters that follow.

Procedure

Participants were recruited via an online research management system from the Communication Department's participant pool (Experiments 1-3) or from an upper division communication course at the University of Maryland (Experiment 4). People were offered a small amount of extra credit for their participation in each study. After agreeing to participate, participants were directed to an online survey hosted by Qualtrics survey software. Participants were then informed of the alleged purpose of the study—to evaluate the quality of student speakers at UMD—and then they were asked for and gave informed consent. They were then randomly assigned to experimental conditions.

People read or listened to speeches allegedly given by UMD undergraduate students. In Experiments 1, 2, and 4, participants read speeches that were paired with

a digital photograph of the speaker. All photographs were standardized to the size of 240 X 320 pixels. The photograph appeared on the same page as and immediately above the text of the speech. In Study 3, participants listened to recordings of speeches at varying pitch depths. No other information about the speaker was provided to the participants aside from him (all speakers were male) being a student of the university who gave the speech in an oral communication course. Participants encountered three messages attributed to different sources in Experiments 1, 2, and 3. Although they read multiple messages, these messages were consistent in manipulated condition in order to retain a between-subjects experimental design (i.e., participants read three messages with the same level for both independent variables). The order with which messages were presented varied randomly for each participant.

After reading each message, participants answered a series of questions about the speaker, the speech, and their opinions on the topic of the speech. After answering items related to each individual speech, they also completed items to assess the individual difference variable of dominance. Finally, in order to assess whether participants were suspicious of the purpose of the studies, they were given the opportunity to provide their thoughts about the purpose of the study at the end of the questionnaire. After data collection was completed for all studies, participants received an email with a debriefing statement.

Recurring Measures

Unless otherwise noted, all questions were assessed on a 1-7 scale (1 = *strongly disagree*, 7 = *strongly agree*). Descriptive statistics are reported for each experiment in ensuing chapters.

Perceived benefit frame. Participants responded to twelve items assessing the relative benefit brought about by the advocated action to the *source, participant* (i.e., the message target), and *the average UMD student* (i.e., relevant third parties). Four similarly worded items were assessed for each recipient of benefit (e.g., "The speaker has *his* [*my/the average UMD student's*] well-being in mind" and "The speaker cares about how *he* [*I/the average UMD student*] will benefit from this issue").

Likability. Reysen's (2005) likability scale assessed perceived likability of the source. The scale consists of eight items (e.g., "This person is likeable" and "This person is warm").

Attraction. Interpersonal attraction was assessed with three aspects (McCroskey & McCain, 1974). Five items measured *social attraction* (e.g., "I think he could be a friend of mine" and "He would be pleasant to be with"). Six items measured *physical attraction* (e.g., "This person is ugly" [reverse coded] and "This person is not very good looking" [reverse coded]). Six items measured *task attraction* (e.g., "He would be a good person to work with" and "If I wanted to get things done, I could probably depend on him").

Source credibility. Three aspects of source credibility were measured (McCroskey & Teven, 1999) with semantic differential items. Six items assessed *competence* (e.g., "The person who gave this speech seems *unintelligent* vs. *intelligent, inexpert* vs. *expert,* and *incompetent* vs. *competent*"). Six items assessed *goodwill* (e.g., "The person who gave this speech seems *not self-centered* vs. *self-centered, insensitive* vs. *sensitive,* and *phony* vs. *genuine*"). Six items assessed

trustworthiness (e.g., "The person who gave this speech seems *dishonest* vs. *honest*, *untrustworthy* vs. *trustworthy*, and *dishonorable* vs. *honorable"*).

Similarity. Four semantic differential items previously used to measure attitude homophily (McCroskey, Richmond, & Daly, 1975) assessed perceived similarity to the speaker. Items were, for example, "The person who gave this speech seems *unlike me* vs. *like me* and *different from me* vs. *similar to me"*).

Positive affect. The international short form of the positive and negative affect schedule (I-PANAS-SF; Thompson, 2007) was used to assess affect with nine items (e.g., "This message made me feel: *determined* and *inspired"*).

Issue importance. Four items assessed the relevance of the speech topics to participants lives (e.g., "The topic of the speech is important to me" and "I care about the issues at hand in this speech").

Message quality. Eight items assessed the perceived strength of the message (e.g., "This message was persuasive" and "This message swayed me").

Message realism. Five items assessed the believability of the message as a speech that would be presented in an oral communication course (e.g., The speech is typical of something that would be given in a public speaking class" and "Realistically, this is the kind of speech I'd expect for this assignment").

Attitude. Attitude was assessed in two ways. First, a direct measure (O'Keefe, 2002) used nine semantic differential items (McCroskey & Richmond, 1989) to assess attitude toward the current policy addressed in the speech (e.g., "This policy is: *good* vs. *bad*, *harmful* vs. *beneficial*, *fair* vs. *unfair*, and *unfavorable* vs. *favorable*"). Second, a quasi-direct attitudinal measure that assessed agreement with

attitude-relevant statements (O'Keefe, p. 9) utilized a Likert-type scale in which participants rated their agreement with four statements about the policy, which differed based on the topic of the speech (e.g., "Students should not be required to take courses to fulfill distributive studies credits"). Actual prompts for the message-specific quasi-direct measures are reported in the following chapters that outline the experiments in more detail. These two attitude measures were used as independent outcome variables for analyses of variance (ANOVA), but were used as latent indicators for a second-order construct in the structural equation models.

Speech grade. On a 0-100 scale, participants were asked with a single item what grade they would assign to the speech (i.e., "What percentage grade would you give this student for his speech?').

Participant dominance. Dominance was measured with eleven items (1 = *not at all like me*, 7 = *just like me*) taken from the International Personality Pool (2012). Example items included "I try to outdo others" and "I impose my will on others."

Confirmatory Factor Analysis and Indicator Selection

In order to retain consistency of measurement across experiments, a process to select common indicators was conducted. Confirmatory factor analysis (CFA) was used to identify items that strongly loaded onto their respective latent factors. After all data were collected, CFAs were conducted for every message in each experiment, resulting in 10 CFAs. Table 4.1 reports the item loadings for each CFA. These loading were averaged across all 10 CFAs, and the items with the strongest loadings

Table 4.1.

Item Loadings for Individual Messages and Retained Items

	Exp. 1			Exp. 2			Exp. 3			Exp4	Mean	
	M1	M2	M3	M1	M2	M3	M1	M2	M3			
dom1	.15	.15	.15	.34	.34	.34	.38	.38	.38	.53	.31	
dom2	.24	.24	.24	.35	.35	.35	.43	.42	.42	.31	.34	
dom3	.45	.46	.45	.38	.38	.38	.61	.60	.60	.52	.48	
dom4	.56	.55	.55	.49	.49	.49	.73	.73	.73	.56	.59	*
dom5	.52	.51	.51	.49	.49	.49	.68	.68	.68	.52	.56	*
dom6	.57	.58	.57	.52	.52	.52	.59	.59	.58	.52	.56	*
dom7	.22	.22	.22	.39	.39	.39	.40	.40	.40	.39	.34	
dom8	.30	.30	.30	.44	.44	.44	.47	.47	.47	.49	.41	
dom9	.51	.51	.51	.58	.58	.58	.59	.59	.59	.55	.56	*
dom10	.54	.55	.54	.57	.57	.57	.54	.54	.54	.43	.54	
dom11	.08	.08	.08	.04	.04	.03	.05	.05	.06	.07	.06	
sourc1_1	.77	.80	.60	.80	.94	.85	.76	.90	.70	.28	.74	*
sourc2_1	.88	.96	.84	.94	.97	.93	.80	.96	.93	1.00	.92	*
sourc3_1	.62	.78	.84	.79	.83	.75	.43	.63	.69	.87	.72	
sourc4_1	.88	.91	.88	.93	.94	.89	.78	.95	.88	.94	.90	*
targe1_1	.79	.76	.89	.88	.93	.92	.41	.64	.61	.51	.73	*
targe2_1	.77	.85	.86	.90	.95	.89	.79	.87	.84	.73	.85	*
targe3_1	.44	.24	.17	.29	.24	.20	.46	.49	.43	.39	.34	
targe4_1	.76	.65	.55	.62	.70	.72	.88	.87	.85	.70	.73	*
other1_1	.88	.86	.88	.83	.92	.90	.89	.94	.92	.56	.86	*
other2_1	.93	.85	.92	.90	.95	.89	.90	.93	.94	.96	.92	*
other3_1	.67	.58	.72	.73	.64	.46	.66	.51	.54	.68	.62	
other4_1	.90	.86	.87	.90	.88	.84	.78	.81	.76	.93	.85	*
like1_1	.78	.66	.73	.81	.66	.72	.74	.71	.66	.66	.71	*
like2_1	.76	.69	.75	.80	.75	.82	.79	.83	.72	.82	.77	*
like3_1	.73	.75	.67	.75	.72	.69	.73	.80	.71	.69	.72	*
like4_1	.66	.73	.62	.69	.67	.73	.73	.74	.80	.78	.72	*
like5_1	.59	.69	.60	.61	.57	.67	.66	.72	.77	.77	.67	
like6_1	.62	.69	.68	.67	.60	.70	.66	.70	.82	.77	.69	
like7_1	.37	.39	.36	.31	.47	.41	.43	.60	.72	.50	.46	
like8_1	.43	.60	.52	.60	.65	.73	.54	.71	.84	.63	.63	
socat1_1	.76	.76	.73	.83	.79	.83	.78	.85	.88	.68	.79	*
socat2_1	.72	.68	.76	.74	.82	.79	.80	.83	.85	.60	.76	*
socat3_1	.01	.00	.03	.01	.00	.03	.06	.06	.04	.02	.02	
socat4_1	.50	.53	.46	.56	.61	.64	.64	.74	.73	.72	.61	
socat5_1	.61	.62	.54	.60	.63	.56	.74	.84	.82	.62	.66	*
phyat1_1	.15	-26.38 [a]	.90	.27	.16	.89	.85	.85	1.00	-.04	.56	*
phyat2_1	.60	.00 [a]	.07	.59	.49	.09	.00	.07	.06	-.02	.22	
phyat3_1	.14	-.02 [a]	.81	.23	.12	.66	.83	.76	.66	.00	.47	*
phyat4_1	.64	.00 [a]	.13	.73	.80	.14	.03	.01	.01	-.02	.27	
phyat5_1	.86	.00 [a]	.17	.79	.86	.14	.00	.02	.07	-.02	.32	
tasat1_1	.03	.00	.13	.05	.08	.15	.05	.01	.07	.38	.09	
tasat2_1	.81	-.01	.77	.79	.73	.67	.65	.84	.89	.25	.64	*
tasat3_1	.87	1.00	.84	.89	.86	.87	.87	.91	.91	.28	.83	*
tasat4_1	.78	-.06	.75	.82	.80	.81	.88	.86	.84	.24	.67	*
tasat5_1	.00	.00	.06	.06	.06	.13	.02	.02	.00	.01	.04	
tasat6_1	.54	.00	.60	.69	.60	.71	.60	.57	.53	.29	.51	
comp1_1	.60	.57	.53	.58	.67	.66	.59	.73	.65	.63	.62	*
comp2_1	.54	.47	.44	.49	.54	.61	.47	.59	.59	.60	.53	
comp3_1	.47	.43	.38	.47	.55	.55	.52	.51	.52	.62	.50	
comp4_1	.50	.68	.51	.64	.59	.68	.68	.69	.63	.51	.61	*
comp5_1	.60	.67	.58	.67	.73	.69	.67	.70	.74	.66	.67	*
comp6_1	.64	.68	.55	.69	.68	.75	.75	.75	.71	.63	.68	*
good1_1	.82	.82	.68	.77	.85	.78	.82	.86	.82	.49	.77	*
good2_1	.82	.85	.71	.78	.87	.82	.82	.90	.84	.89	.83	*
good3_1	.44	.28	.23	.32	.40	.33	.12	.32	.22	.29	.30	
good4_1	.84	.80	.62	.73	.85	.77	.81	.87	.80	.83	.79	*

good5_1	.29	.26	.32	.26	.43	.38	.36	.33	.45	.51	.36	
good6_1	.43	.52	.57	.43	.43	.45	.57	.64	.55	.66	.53	
trust1_1	.54	.52	.47	.67	.54	.45	.63	.61	.66	.67	.58	
trust2_1	.66	.60	.61	.67	.69	.68	.67	.73	.75	.53	.66	*
trust3_1	.62	.61	.67	.67	.65	.68	.66	.72	.72	.46	.65	*
trust4_1	.57	.71	.61	.75	.70	.75	.75	.82	.71	.54	.69	*
trust5_1	.65	.67	.64	.70	.59	.71	.67	.78	.70	.51	.66	*
trust6_1	.55	.64	.68	.71	.64	.66	.66	.69	.70	.54	.65	
sim1_1	.86	.86	.76	.85	.79	.85	.84	.86	.89	.58	.81	*
sim2_1	.91	.90	.82	.79	.74	.88	.83	.82	.87	.85	.84	*
sim3_1	.76	.85	.71	.79	.83	.82	.83	.85	.83	.85	.81	*
sim4_1	.75	.83	.65	.67	.83	.76	.81	.83	.84	.87	.78	
strong1_1				.68	.57	.67	.71	.75	.67		.68	*
strong2_1				.69	.73	.64	.74	.76	.81		.73	*
strong3_1				.69	.74	.62	.77	.74	.80		.73	*
panas1_1	.69	.81	.70	.76	.74	.77	.74	.81	.76	.39	.72	*
panas2_1	.56	.69	.47	.60	.49	.55	.68	.70	.66	.43	.58	*
panas3_1	.83	.85	.82	.84	.84	.91	.81	.88	.92	.46	.82	*
panas4_1	.78	.75	.63	.75	.81	.76	.81	.78	.83	.38	.73	*
panas5_1	.16	.07	.06	.00	.14	.07	.04	.06	.04	.14	.08	
panas6_1	.14	.04	.01	.01	.13	.02	.02	.03	.02	.19	.06	
panas7_1	.10	.05	.00	.00	.09	.00	.01	.01	.01	.28	.06	
panas8_1	.08	.01	.00	.02	.03	.00	.00	.01	.00	.25	.04	
panas9_1	.07	.05	.00	.01	.03	.00	.01	.00	.00	.24	.04	
att1_1	.88	.82	.82	.88	.83	.82	.80	.89	.91	.74	.84	*
att2_1	.87	.81	.84	.92	.80	.81	.84	.91	.89	.73	.84	*
att3_1	.61	.83	.78	.80	.81	.63	.85	.79	.93	.57	.76	
att4_1	.81	.73	.75	.83	.75	.74	.79	.79	.79	.80	.78	
att5_1	.79	.75	.82	.80	.70	.71	.78	.81	.86	.69	.77	
att6_1	.83	.90	.85	.92	.83	.72	.86	.89	.90	.81	.85	*
att7_1	.66	.61	.67	.72	.69	.72	.47	.73	.67	.69	.66	
att8_1	.77	.86	.78	.82	.82	.65	.69	.86	.86	.62	.77	
att9_1	.78	.87	.80	.85	.85	.70	.69	.86	.90	.75	.81	*
opin1_1	.85	.84	.91	.89	.28	.87	.60	.85	.80	.67	.76	
opin2_1	.65	.87	.94	.90	.81	.89	.79	.85	.89	.90	.85	*
opin3_1	.83	.89	.94	.86	.56	.93	.64	.86	.87	.86	.82	*
opin4_1	.65	.89	.77	.87	.72	.89	.82	.80	.92	.67	.80	*
import1_1	.88	.84	.81	.85	.84	.82	.86	.84	.85	.37	.80	
import2_1	.88	.87	.79	.91	.78	.87	.85	.87	.81	.99	.86	*
import3_1	.74	.66	.55	.71	.76	.63	.60	.77	.81	.89	.71	*
import4_1	.89	.71	.78	.90	.83	.84	.80	.89	.79	.92	.84	*
mqual1_1	.74	.76	.72	.68	.59	.67	.79	.86	.78	.47	.71	*
mqual2_1	.79	.80	.75	.80	.79	.77	.83	.89	.82	.75	.80	*
mqual3_1	.31	.22	.40	.37	.27	.31	.22	.32	.33	.15	.29	
mqual4_1	.42	.45	.48	.45	.33	.39	.27	.41	.44	.39	.40	
mqual5_1	.64	.52	.42	.48	.61	.56	.34	.51	.49	.60	.52	
mqual6_1	.72	.67	.55	.72	.68	.79	.46	.56	.62	.94	.67	*
mqual7_1	.72	.65	.48	.60	.68	.73	.47	.58	.53	.76	.62	
mqual8_1	.61	.53	.48	.52	.49	.52	.50	.52	.60	.75	.55	
real1_1	.70	.62	.59	.75	.73	.55	.78	.66	.79	.60	.68	
real2_1	.83	.76	.85	.74	.83	.73	.87	.86	.91	.77	.82	*
real3_1	.89	.81	.87	.81	.81	.79	.85	.91	.89	.76	.84	*
real4_1	.79	.77	.65	.74	.76	.69	.85	.79	.90	.74	.77	*
real5_1	.73	.68	.65	.69	.73	.70	.76	.78	.78	.71	.72	

Note. Starred items indicates retained items used in experimental analyses.
[a] Convergence issues were apparent for physical attractiveness in Experiment 1, Message 2, and these loadings were excluded from the mean loadings.

were retained as indicators in subsequent structural equation models and were used to form composite variables for repeated measures ANOVA.

Attempts were made to use three or four indicators for each latent, depending on the initial number of items measured to assess the constructs and the number of items that demonstrated consistently strong loadings. Scales that initially used a large number of items resulted in a larger number of retained items. In two cases (i.e., physical attractiveness and depth of voice), only two indicators were selected due to low or inconsistent loadings of the remaining indicators.

Transformations

For the purposes of assessing the effect of experimental conditions via ANOVA, composite variables were created with these retained items by averaging the items. Extreme values were excluded case wise before assessing normality: Experiment 1 needed a single case removed for a Message 1 grade of 9; Experiment 2 needed two cases removed for Message 1 grades of 8 and 9, a single case removed for a Message 2 grade of 9, and two cases removed for Message 3 grades of 4 and 7; Experiments 3 and 4 did not require removal of outliers. Aside from grades in the first two experiments, no other variables demonstrated the presence of suspect outliers. Skew was assessed for these and all other variables used in ANOVAs for all four experiments. Likert-type scaled items were approximately normal—skewness statistics were below a value of |1|—and were left untransformed. The only variables needing transformation according to this criterion were the percentage grades assigned to each speaker. All grade values were raised to the 2.5 power, thereby reducing their skew to acceptable levels of skewness (of less than 1). Table 4.2

Table 4.2.

Initial and Final Skewness Statistics for Grades Assigned to Speaker Using Exponent 2.5 Transformations

	Message 1		Message 2		Message 3	
	Initial	Final	Initial	Final	Initial	Final
Exp. 1	-2.72	-0.65	-2.78	-0.69	-2.97	-0.65
Exp. 2	-4.24	-0.82	-3.38	-0.67	-3.05	-0.66
Exp. 3	-1.12	-0.51	-1.01	-0.43	-1.61	-0.80
Exp. 4	-1.28	-0.27				

reports the initial skew and final skew statistics after transformation of the grade variables.

Testing Within-Subjects Effects

Repeated measures ANOVAs were used to assess the within-participant effects of the independent variables on the dependent variables across messages. These tests were conducted to determine whether the independent variables substantially interacted with within-subjects message repetitions. Whereas significant main effects for message were appropriate—variation in participants' assessments of messages were to be expected because of the possibility of some messages or photographs being more persuasive than others—strong interaction effects between within-subjects messages and independent variables would be difficult to clearly interpret the between-subject effects. Such interactions would indicate that the hypothesized relationships among independent variables do not function similarly for different messages and sources. Weak within-subjects-between-subject variable interactions would suggest that relationships among the independent variables essentially function the same regardless of the message's topic of source's unique

phenotypic characteristics. Thus, significant within-between variable interactions were seen as tolerable if their effects were small and problematic if their effects were large.

Tables 4.3, 4.4, and 4.5 show the *F*-test results for within-subjects effects for the three experiments that used within-subjects designs. Due to the violation of many Box's tests of equality of covariance matrices—indicating that the assumption of equality of covariances was violated—the Greenhouse-Geisser test was used. As seen in Tables 4.3 (Experiment 1), 4.4 (Experiment 2), and 4.5 (Experiment 3), a number of interactions between within-subjects and between-subjects variables were significant. However, the effect sizes associated with the interactions were small (i.e., $\eta^2 \leq .05$), indicating that any significant interactions would only marginally affect interpretations of between-subjects effects. Simply put, independent variables (i.e., source characteristic, benefit frame, and participant dominance) essentially functioned similarly across within-subjects message repetitions. Therefore, all significant interactions between within-subjects and between-subjects variables were not deemed problematic in interpreting repeated measures between-subjects effects, which are reported in ensuing chapters.

Data Analysis for Hypothesis Testing

Interaction Testing

The interaction was tested in two ways. First, for Experiments 1, 2, and 3, repeated measures analysis of covariance ANCOVA was used to assess the hypothesized effects of source characteristic, message benefit frame, and participant dominance, and their interactions, on the dependent variables of attitude and

Table 4.3. *Within-Subjects Effects for Experiment 1*

Variable	Box's Test *F*	M		M*D		M*B		M*S		M*B*S		M*B*D		M*S*D		M*B*S*D	
		F	η	F	η	F	η	F	η	F	η	F	η	F	η	F	η
Perceived source ben.	56.87***	1.73	0.1	1.29	.01	0.91	.00	.26	.00	.20	.00	.04	.00	.09	.00	.67	.00
Perceived participant ben.	44.25**	1.26	.01	0.41	.00	3.22*	.01	4.86**	.02	2.74	.01	0.93	.00	5.62**	.02	2.91	.01
Perceived avg. student ben.	48.73***	0.75	.011	0.36	.00	0.81	.00	5.47**	.02	0.63	.00	0.05	.00	5.88**	.02	0.48	.00
Likability	22.12	3.91*	.01	1.11	.00	3.43*	.01	3.46*	.01	0.47	.00	1.07	.00	4.33*	.02	0.13	.00
Social attraction	28.16	1.41	.00	0.86	.00	4.86**	.02	0.89	.00	0.07	.00	2.33	.01	1.58	.01	0.34	.00
Physical attraction	33.94*	1.85	.01	0.54	.00	1.57	.01	0.30	.00	0.11	.00	3.20*	.01	0.26	.00	0.55	.00
Task attraction	22.22	4.51*	.02	0.73	.00	1.07	.00	0.42	.00	0.07	.00	1.60	.00	0.32	.00	0.03	.00
Competence	17.89	2.58	.01	1.48	.01	0.83	.00	0.91	.00	0.20	.00	0.54	.00	0.82	.00	0.19	.00
Goodwill	56.32***	3.65*	.01	2.23	.01	1.28	.01	1.13	.00	3.29*	.01	0.12	.00	1.47	.01	3.35*	.01
Trustworthiness	18.05	8.29***	.03	3.10*	.01	0.80	.00	1.14	.00	0.10	.00	0.03	.00	1.10	.00	0.40	.00
Similarity	25.73	1.91	.01	0.78	.00	0.62	.00	1.21	.00	0.45	.00	0.29	.00	1.55	.01	0.65	.00
Positive affect	12.80	1.59	.01	1.18	.00	1.38	.01	0.06	.00	5.40**	.02	2.32	.01	0.00	.00	3.77*	.01
Attitude, direct	21.20	78.98***	.22	8.54***	.03	0.17	.00	1.87	.01	0.08	.00	0.08	.00	3.00	.01	0.05	.00
Attitude, quasi-direct	29.53*	15.61***	.05	4.24*	.02	0.31	.00	1.95	.01	1.18	.00	0.62	.00	2.10	.01	1.05	.00
Issue importance	12.77	0.05	.00	0.75	.00	0.42	.00	2.65	.01	1.44	.01	0.97	.00	4.00*	.01	1.13	.00
Message quality	28.57	1.03	.00	0.85	.00	0.23	.00	2.52	.01	1.08	.00	1.18	.00	2.29	.01	1.01	.00
Message realism	41.31**	0.40	.00	0.19	.00	0.62	.00	0.81	.00	1.56	.01	0.51	.00	1.46	.01	1.87	.01
Grade (transformed)	30.84*	1.04	.00	1.14	.00	0.45	.00	0.18	.00	0.34	.00	0.98	.00	0.17	.00	0.25	.00

Note. M=Message used in repeated measures design, D=Participant Dominance, B=Benefit Frame Condition, S=Symmetry Condition

Table 4.4. *Within-Subjects Effects for Experiment 2*

		M		M*D		M*B		M*S		M*B*S		M*B*D		M*S*D		M*B*S*D	
Variable	Box's Test *F*	F	η	F	η	F	η	F	η	F	η	F	η	F	η	F	η
Perceived source ben.	39.19**	2.05	.01	0.48	.00	0.98	.00	.023	.00	1.90	.01	0.84	.00	0.29	.00	1.60	.01
Perceived participant ben.	49.43***	2.43	.01	1.82	.01	0.86	.00	4.24*	.02	0.91	.00	0.04	.00	4.01*	.02	0.24	.00
Perceived avg. student ben.	85.41***	0.89	.00	0.07	.00	4.62*	.02	2.67	.01	3.45*	.01	2.23	.01	1.81	.01	2.12	.01
Likability	67.97***	2.21	.01	0.31	.00	0.54	.00	0.04	.00	2.66	.01	0.17	.00	0.03	.00	2.03	.01
Social attraction	83.40***	1.51	.01	0.43	.00	0.88	.00	1.97	.01	0.68	.00	0.93	.00	2.27	.01	0.69	.00
Physical attraction	58.93***	0.16	.00	0.94	.00	0.01	.00	0.69	.00	0.14	.00	0.06	.00	0.55	.00	0.02	.00
Task attraction	48.87***	3.92*	.02	2.44	.01	0.51	.00	1.24	.00	0.57	.00	0.45	.00	1.70	.01	0.72	.00
Competence	34.45*	2.75	.01	1.44	.01	0.47	.00	1.76	.01	0.29	.00	0.42	.00	1.96	.01	0.24	.00
Goodwill	54.77***	9.58***	.04	2.25	.01	3.72*	.02	1.84	.01	3.04*	.01	0.84	.00	1.43	.01	1.70	.01
Trustworthiness	43.99**	3.85*	.02	2.87	.01	0.46	.00	1.72	.01	1.73	.01	0.43	.00	1.91	.01	0.82	.00
Similarity	43.14**	2.39	.01	0.52	.00	2.29	.01	0.51	.00	0.15	.00	1.44	.01	0.26	.00	0.08	.00
Source dominance	37.08**	0.66	.00	0.34	.00	0.52	.00	0.32	.00	0.54	.00	0.59	.00	0.26	.00	0.84	.00
Positive affect	28.89	4.80**	.02	2.35	.01	0.64	.00	1.08	.00	0.14	.00	0.67	.00	1.06	.00	0.61	.00
Attitude	31.88*	9.00***	.04	0.36	.00	0.38	.00	0.90	.00	1.77	.01	0.24	.00	1.11	.01	1.44	.01
Opinion about change	27.60	13.32***	.05	0.42	.00	0.31	.00	0.85	.00	1.95	.01	0.31	.00	0.90	.00	2.28	.01
Issue importance	16.91	3.43*	.01	0.58	.00	2.01	.01	0.92	.00	1.24	.01	1.54	.01	0.85	.00	1.32	.01
Message quality	40.34**	3.28*	.01	0.34	.00	0.11	.00	0.03	.00	0.72	.00	0.11	.00	0.23	.00	0.95	.00
Message realism	21.81	1.97	.01	0.19	.00	0.21	.00	1.57	.01	0.20	.00	0.05	.00	2.46	.01	0.05	.00
Grade (transformed)	38.94**	1.83	.01	0.82	.00	0.71	.00	0.96	.00	3.13*	.01	0.91	.00	1.20	.01	3.52*	.02

Note. M=Message used in repeated measures design, D=Participant Dominance, B=Benefit Frame Condition, S=Sexual Dimorphism Condition, Face

Table 4.5. *Within-Subjects Effects for Experiment 3*

Variable	Box's Test	M		M*D		M*B		M*S		M*B*S		M*B*D		M*S*D		M*B*S*D	
	F	F	η	F	η	F	η	F	η	F	η	F	η	F	η	F	η
Perceived source ben.	45.96*	1.89	.01	1.11	.01	1.55	.01	1.43	.01	3.35**	.03	0.04	.00	1.54	.01	3.61**	.03
Perceived participant ben.	46.45*	0.95	.00	0.00	.00	2.85	.01	3.47**	.03	1.50	.01	1.91	.01	3.58**	.03	1.49	.01
Perceived avg. student ben.	64.72***	0.36	.00	0.92	.00	1.50	.01	2.46*	.02	1.33	.01	0.30	.00	2.49*	.02	1.59	.01
Likability	38.51	0.70	.00	0.57	.00	2.33	.01	3.03*	.03	1.36	.01	0.82	.00	3.40*	.03	1.62	.01
Social attraction	50.38*	0.94	.00	1.22	.01	1.89	.01	2.98*	.03	3.03*	.03	1.46	.01	3.66**	.03	3.60**	.03
Physical attraction	85.77***	3.16*	.01	1.48	.01	0.84	.00	1.13	.01	2.08	.02	1.03	.01	1.03	.01	1.75	.02
Task attraction	49.61*	1.11	.01	0.71	.00	3.38*	.02	1.54	.01	1.24	.01	3.17*	.01	1.47	.01	1.14	.01
Voice depth	18.55	3.90*	.02	0.99	.00	0.89	.00	0.02	.00	0.45	.00	0.19	.00	0.42	.00	0.51	.01
Competence	68.58***	1.00	.011	0.72	.00	2.25	.01	1.01	.01	1.63	.01	1.82	.01	0.92	.01	1.90	.02
Goodwill	59.38**	1.02	.00	0.11	.00	4.42*	.02	2.23	.02	2.28	.02	1.43	.01	2.46*	.02	2.80*	.02
Trustworthiness	61.49**	0.63	.00	0.35	.00	6.68**	.03	2.06	.02	0.74	.01	4.18*	.02	2.10	.02	0.83	.01
Similarity	63.31**	2.12	.01	1.27	.01	4.23*	.02	2.60*	.02	5.45***	.05	3.66*	.02	3.57**	.03	6.07***	.05
Source dominance	40.42	0.77	.00	0.17	.00	2.45	.01	0.64	.01	2.36	.02	1.82	.01	0.53	.01	2.95*	.03
Positive affect	52.91**	0.27	.00	1.03	.01	0.13	.00	2.28	.02	3.03*	.03	0.24	.00	2.49*	.02	4.75**	.04
Attitude	33.44	26.28***	.10	1.63	.01	0.52	.00	1.48	.01	0.20	.00	1.19	.01	1.28	.01	0.24	.00
Opinion about change	33.61	1.01	.00	.018	.00	2.02	.01	1.52	.01	1.39	.01	1.05	.01	2.03	.02	1.44	.01
Issue importance	43.99	1.95	.01	1.34	.01	2.11	.01	2.60*	.02	1.06	.01	1.02	.00	2.51*	.02	1.43	.01
Message quality	52.16*	0.17	.00	0.33	.00	0.82	.00	2.57*	.02	2.92*	.03	0.10	.00	2.86*	.03	3.39*	.03
Message realism	60.19**	0.49	.00	1.71	.01	2.89	.01	2.86*	.03	0.36	.00	2.39	.01	3.05*	.03	0.52	.01
Grade (transformed)	49.08*	0.12	.00	0.24	.00	0.88	.00	1.42	.01	0.91	.01	0.24	.00	1.52	.01	1.39	.01

Note. M=Message used in repeated measures design, D=Participant Dominance, B=Benefit Frame Condition, S=Sexual Dimorphism Condition, Voice

attributions toward the source and message. For Experiment 4, non-repeated measures ANCOVA was used. Consistent with Aiken and West (1991), significant interactions resulting from this analysis were decomposed independently for all three messages using moderation analysis via Hayes's (2013) PROCESS macro.

Second, planned contrasts were conducted to test for the specific three-way interaction. The predicted interaction (see Figure 2.1) was assessed using repeated measures planned comparisons. This single degree-of-freedom test was perhaps preferable given the *a priori* predictions regarding groups' differential susceptibility to influence based on a source's phenotype, the message's communicated goodwill, and participants' dominance. Groups were assigned numerical weights according to the following procedure for each experiment. A median split was used to dichotomize two groups of participants high or low in dominance. Eight groups of roughly equivalent sizes were then created based on a 2 (source cue) x 2 (message benefit frame) x 2 (participant dominance) design.

Each group was assigned a numerical ranking based on participants' relative expected susceptibility to influence. Groups were assigned to one of four ordered levels. The group with low dominance, source cue present, and source benefit was assigned as 4. The two groups with low dominance, source cue absent or present, and target benefit were assigned as 3. The three groups consisting of low dominance, source cue absent, and source benefit as well as high dominance, source cue absent or present, and target benefit were assigned as 2. The two groups with high dominance, source cue present or absent, and source benefit were assigned as 1. This interval variable was then entered as the sole continuous predictor in the repeated measures

general linear model for Experiments 1-3 and in a non-repeated general linear model for Experiment 4. For repeated measures, this procedure was conducted by entering the contrast variable as a covariate and sole predictor of the within-subjects variable in repeated measures ANOVAs.

Similar to the previously reported repeated measures ANCOVAs for the first three studies, interactions between the within-subjects message variable and between-subjects contrast variable were either nonsignificant or significant but with minimal effect sizes (i.e., $\eta^2 < .05$). Thus, when significant repeated measures between-subjects effects were found for the contrast, the effects were interpreted as similarly functioning across message repetitions.

Model Testing

Structural equation modeling with LISREL 9.1 was used to test the model. Separate analyses were conducted for each message. Individual items served as indicators for latent variables in the measurement model. The first exogenous variable, source condition, was dummy coded to indicate the physical qualities ascribed to the photographs (i.e., for Experiment 1: 0 = *asymmetrical* and 1 = *symmetrized*; for Experiment 2: 0 = *feminine* and 1 = *masculine*; and for Experiment 4: 0 = *other-morph* and 1 = *self-morph*) and was coded ordinally to indicated the depth of voice in each audio recording (i.e., for Experiment three: 1 = *deep*, 2 = *original*, 3 = *high*). The second exogenous variable, message benefit frame, was dummy coded to indicate the presence of source selfishness (i.e., 0 = *target benefit* and 1 = *source benefit*). Finally, a third exogenous variable represented the interaction term of these two experimental variables. Because these experimental exogenous

latent variables each had a single indicator, error variances of the indicators were fixed to zero. Covariances among latent variables were fixed to zero. A single loading for each latent exogenous construct was fixed to one to provide scale. All latent variables were entered into confirmatory factor analyses.

The structural model consisted of a partial mediation model whereby all cognitive and affective responses to the manipulated source cue were entered as a panel of latent partial mediators for the effects of the exogenous variables on attitude. Within this panel of intervening variables, latent constructs were allowed to covary. The outcome variable of attitude was modeled as a higher order latent variable, which explained the latent direct and quasi-direct attitude factors. The variance of this higher-order attitude latent was fixed to one for identification purposes, as was a single path from a single first-order latent indicator. This structural model served to test the direct and indirect effects of source cue on attitude, and can be seen in Figure 4. For Experiments 2 and 3, an additional latent variable, source dominance, which was used as an induction check, was also entered in the panel of intervening variables.

To assess the interaction of experimental variables with participant dominance, multigroup comparison methods were used to compare if the model functioned differently for people high or low in dominance. Participants in each experiment were split into dichotomous groups of low and high dominance based on the study sample's median. In line with Byrne (1998), the theorized structural model was first run for both groups simultaneously with the measurement model constrained while allowing the free estimation of all structural path coefficients to assess

appropriate fit. Next, the model was run simultaneously for both groups with all structural paths constrained to be equal between groups. Finally, modification indices were consulted iteratively to see if the release of any structural paths between groups would result in a significant reduction in model χ^2. Single paths were released, models were rerun, and modification indices consulted until no significant structural modifications were suggested.

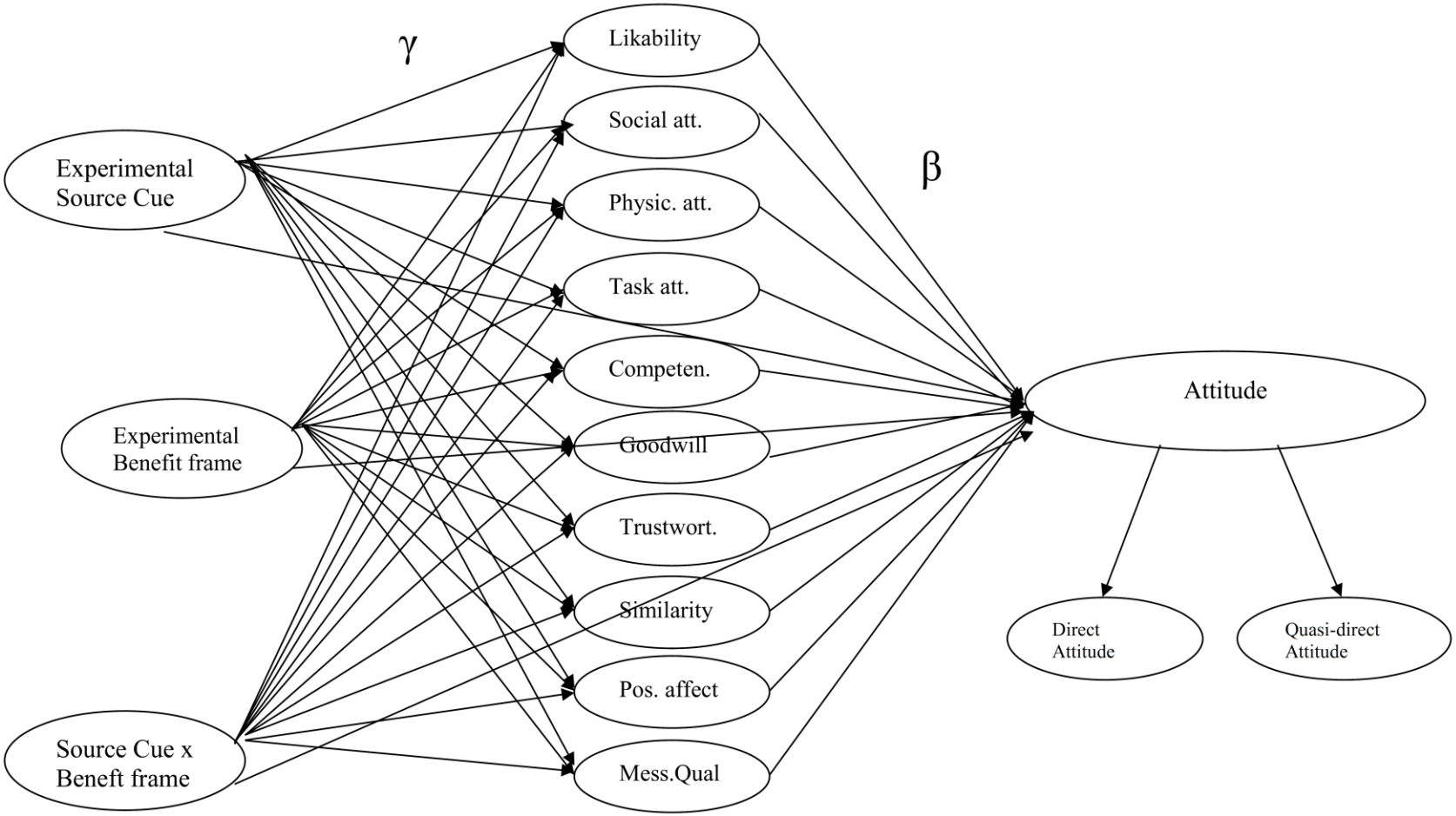


Figure 4. Theorized structural model.
Note. Perceived source dominance was also modeled as a latent mediator for experiments 2 and 3.

Chapter 5: Experiment 1

The purpose of this study was to assess whether attractiveness of a source, which was manipulated by altering the symmetry of the source's face, and the communicated benefit frame in a message affect attitude change in targets with varying degrees of dominance. It was hypothesized that a source's facial symmetry would interact with benefit frame and participants' dominance. In particular, less dominant participants in the source benefit message condition, compared to the target benefit message condition, will be more persuaded by symmetrical faces. Less dominant participants in the target benefit message condition, compared to the source benefit message condition, will be more persuaded by asymmetrical faces. Finally, participants high in dominance will experience less persuasion from source benefit messages than from target benefit messages regardless of the facial symmetry of the source.

Method

Participants

Participants were 287 students who volunteered from a variety of communication courses in exchange for a small amount of extra credit. Fifty-six percent were female and 44% were male. Participants were between 18 and 36 years old (M = 19.91, SD = 2.04). Participants self-reported their race as White (64%), Asian (14%) and African American (13%), with less than 6% in any other listed group. In a separate question, eight percent responded as being of Hispanic, Latino, or Spanish origin.

Experimental Stimuli

Three pairs of asymmetrical and symmetrized face photographs used in previously published facial symmetry studies were used as stimuli in this research (see Figure 1; Little, Jones, Burt, & Perrett, 2007; Quist, Watkins, Smith, Little, DeBruine, & Jones, 2012; Watkins, Jones, Little, DeBruine, & Feinberg, 2012). These images were previously created by utilizing a symmetrizing technique, whereby computer graphic methods are used to manipulate a photograph of a relatively asymmetric original face into a more symmetric shape while retaining original skin color, texture, and other unique facial characteristics (Perrett et al., 1999; Watkins et al., 2012). This procedure consisted of first overlaying a matrix of 224 feature points on a photograph of a face and averaging the height and lateral position of corresponding pairs of points. Then, these averages were then used to warp the face into a remapped symmetric shape.

The photograph sets were randomly paired with messages to serve as the fitness-signaling source cues for each message previously selected for inclusion in Experiment 1 (see Table 3.2). According to the labels in Figure 5.1, photograph set "a" was coupled with the message pair about the ticket distribution policy to university football games (Message 18, hereafter referred to as Message 1), set "b" was coupled with the message pair about the need for more counselors at the university's counseling center (Message 9, hereafter referred to as Message 2), and set "c" was coupled with the message pair about extending the university's Good Samaritan policy to protect those who call for help in a drug-related emergency (Message 15, hereafter referred to as Message 3).

(a)

(b)

(c)

Figure 5.1. Asymmetric original (left) and symmetrical (right) faces used in Experiment 1. (a) From Watkins, Jones, Little, DeBruine, and Feinberg (2012), p. 547. (b) From Quist, Watkins, Smith, Little, DeBruine, and Jones (2012), p. 1417. (c) From Little, Jones, Burt, and Perrett (2007), p. 213.

Unique Measures

Descriptive statistics of all measures in Experiment 1 appear in Table 5.1.

Source attractiveness manipulation check. Because the study manipulated facial symmetry to produce more and less perceived attractiveness, the attraction measures previously reported served as the manipulation check.

Quasi-direct attitude measure. Three items were initially measured after each speech to assess attitude toward the policy change via level of agreement (1 = *strongly disagree*, 7 = *strongly agree*) with policy-relevant statements: In Message 1 (e.g., "I would be willing to pay more in student fees to hire more counselors at the Counseling Center" and "Student fees should be increased to decrease the wait time before seeing a counselor"), Message 2 (e.g., "UMD should adopt the comprehensive Good Samaritan policy" and "I support the expansion of the Good Samaritan policy to include protection in drug-related emergencies"), and Message 3 (e.g., "More no-shows should be allowed before students become ineligible for football tickets" and "I am in favor of changing the current football no-show policy").

Results

The following repeated measures ANOVAs are reported in Table 5.2.

Manipulation Checks

Facial symmetry. The effect of the source's facial symmetry on perceived attractiveness was not successful. Physical attraction, $F(1, 279) = 0.00$, $p = ns$, social attraction, $F(1, 279) = 0.09$, $p = ns$, and task attraction, $F(1, 279) = 0.14$, $p = ns$, did not significantly differ for those who were exposed to a symmetrized source

Table 5.1. *Experiment 1 Means, Standard Deviations, and Reliability Statistics*

Variable	# items	Message 1			Message 2			Message 3		
		M	SD	α	M	SD	α	M	SD	α
Participant dominance[a]	4	3.94	1.17	.83						
Perceived source benefit	3	4.75	1.73	.94	3.90	2.00	.96	3.68	1.74	.91
Perceived target benefit	3	4.62	1.44	.91	4.99	1.29	.89	4.81	1.28	.90
Perceived avg. student benefit	3	5.20	1.45	.97	5.34	1.30	.95	5.43	1.20	.96
Likability	4	4.41	1.03	.93	4.72	1.03	.94	4.83	1.02	.92
Social attraction	3	4.21	0.98	.87	4.41	1.06	.87	4.46	1.01	.86
Physical attraction	2	4.07	0.91	.82	4.12	0.88	.87	3.50	1.08	.92
Task attraction	3	4.04	1.01	.93	4.49	0.98	.93	4.53	0.94	.92
Competence	4	4.77	0.99	.85	5.01	1.03	.89	5.09	0.91	.82
Goodwill	3	4.49	1.49	.94	4.91	1.35	.94	4.96	1.17	.90
Trustworthiness	4	4.72	0.92	.87	5.15	0.97	.88	5.20	1.05	.88
Similarity	3	4.00	1.36	.94	4.17	1.46	.95	4.28	1.28	.90
Positive affect	4	4.09	1.33	.91	4.33	1.36	.94	4.55	1.14	.88
Attitude	4	2.81	1.30	.95	2.63	1.53	.96	5.94	1.18	.95
Opinion about change	3	5.43	1.28	.88	4.63	1.66	.96	5.70	1.33	.96
Issue importance	3	4.26	1.66	.94	4.52	1.48	.89	4.65	1.35	.86
Message quality	3	4.47	1.41	.90	4.60	1.38	.89	4.84	1.24	.84
Message realism	3	5.07	1.19	.94	5.07	1.15	.91	5.17	1.17	.91
Grade[b]	1	83.57	9.45		84.66	9.82		95.41	9.25	

Note. [a] Participant dominance was assessed at a single time independent of the message repetitions, resulting in a single individual difference measurement.
[b]Grade means and standard deviations reflect scores prior to transformation. Data analyses were conducted on grades after transformation consistent with Chapter 4 descriptions.

compared to those who were exposed to an asymmetrical source. These results suggest that the attractiveness manipulation failed. However, given that facial symmetry may affect attitudes and source attributions independently of perceptions of attractiveness, further data analysis was warranted. That is, it was possible that participants were affected by facial symmetry in ways that altered the persuasiveness of the message other than through attribution of physical attractiveness.

Benefit frame. Repeated measures ANOVAs provided evidence to suggest benefit frame was successfully manipulated across within-participant cells. Participants who read the source benefit message perceived significantly greater source benefit compared to those who read the target benefit frame across messages, $F(1, 279) = 78.99$, $p < .001$, partial $\eta^2 = .22$. Similarly, the source benefit message elicited lower perceptions of target benefit, $F(1, 279) = 8.63$, $p < .01$, partial $\eta^2 = .03$, and average student benefit, $F(1, 279) = 5.64$, $p < .05$, partial $\eta^2 = .02$, compared to those who read the target benefit frame. Thus, the benefit frame manipulation was successful.

Hypothesis Testing

A three-way interaction was expected whereby (a) less dominant people would experience greater attitude change—and attributions associated with attitude change—from self-interested (i.e., communicated source benefit frame) sources with symmetrized faces compared to other-interested sources with symmetrized faces, (b) less dominant people would experience greater attitude change from other-interested sources with asymmetrical faces compared to self-interested sources with asymmetrical faces, and c) dominant people would be less persuaded by self-

interested sources compared to other-interested sources regardless of facial symmetry (*H1)*. Before this three-way interaction is evaluated, it is necessary to mention the main effects and two-way interactions.

Main effects. Facial symmetry independently affected only perceived benefit to the average student ($\eta^2 = .01$). Those who read messages from the symmetrized sources perceived greater benefit to the average student compared to those who read the messages from asymmetrical sources.

Benefit frame independently affected perceptions of the source and message. In addition to influencing the aforementioned manipulation check variables, people who were exposed to the source benefit message experienced less social attraction ($\eta^2 = .02$), goodwill ($\eta^2 = .04$), similarity ($\eta^2 = .02$), and assigned a lower grade ($\eta^2 = .02$) than those people who were exposed to the target benefit message.

Finally, participant dominance served as a significant independent predictor of many dependent variables within subjects (see Table 5.2). In particular, as dominance increased, so did perceived benefit to the average student ($\eta^2 = .01$), social ($\eta^2 = .02$) and physical ($\eta^2 = .01$) attraction toward the source, and attitude toward the topic of the speech ($\eta^2 = .02$).

Interaction effects. A number of between-subjects repeated-measures interactions were found (see Table 5.2). In cases in which both two-way and three-way interactions among independent variables were significant, only the three-way interaction was decomposed to explain the effect. For significant repeated-measures interactions including participant dominance, simple slopes analyses were subsequently conducted for each of the three messages. These interactions were

Table 5.2. *Experiment 1 Repeated Measures ANCOVAs Between-Subjects Effects*

	Participant Dominance		Benefit Condition (0=target benefit, 1=source benefit)		Symmetry Condition (1=asymmetrical, 2=symmetrized)		Benefit * Symmetry		Benefit * Dominance		Symmetry * Dominance		Benefit * Symmetry * Dominance	
Dependent Variable	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2
Perceived source benefit	0.14	.00	78.99***	.22	0.94	.00	0.00	.00	6.78*	.02	1.60	.01	0.26	.00
Perceived part. ben.	0.76	.00	8.63**	.03	0.86	.00	0.19	.00	1.55	.01	0.21	.00	0.23	.00
Perc. avg. student ben.	2.93*[a]	.01	5.64*	.02	2.85*[a]	.01	0.31	.00	0.14	.00	1.37	.01	0.96	.00
Likability	0.09	.00	2.15	.01	0.58	.00	0.15	.00	0.14	.00	0.34	.00	0.03	.00
Social attraction	4.21*	.02	6.63**[a]	.02	0.09	.00	0.13	.00	3.60*[a]	.01	0.10	.00	0.30	.00
Physical attraction	3.37*[a]	.01	1.30	.01	0.00	.00	0.46	.00	1.24	.00	0.09	.00	0.75	.00
Task attraction	0.75	.00	2.39	.01	0.14	.00	0.34	.00	1.05	.00	0.06	.00	1.22	.00
Competence	0.07	.00	1.20	.00	0.17	.00	1.66	.01	0.33	.00	0.04	.00	0.22	.01
Goodwill	0.01	.00	11.87***	.04	.056	.00	0.01	.00	1.61	.01	0.02	.00	0.12	.00
Trustworthiness	1.35	.01	1.40	.01	0.71	.00	0.03	.00	0.09	.00	0.18	.00	0.07	.00
Similarity	2.01	.01	4.72*	.02	1.84	.01	0.53	.00	1.68	.01	0.71	.00	1.26	.01
Positive affect	0.30	.00	0.88	.00	0.36	.00	2.75*[a]	.01	0.05	.00	0.03	.00	3.35*[a]	.01
Attitude, direct	6.49**[a]	.02	0.20	.00	0.56	.00	0.47	.00	0.40	.00	0.83	.00	1.19	.00
Attitude, quasi-direct	1.59	.01	0.20	.00	0.57	.00	0.11	.00	0.09	.00	0.70	.00	0.01	.00
Issue importance	0.40	.00	0.65	.00	0.60	.00	0.35	.00	0.56	.00	1019	.00	0.11	.00
Message quality	0.79	.00	0.41	.00	2.71	.01	1.86	.01	0.00	.00	3.03*[a]	.01	1.82	.01
Message realism	0.71	.00	0.01	.00	0.10	.00	0.01	.00	0.70	.00	0.21	.00	0.08	.00
Grade (trans)	2.02	.01	6.52**[a]	.02	0.97	.00	0.00	.00	4.29*	.02	0.43	.00	0.10	.00

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

"[a]" indicates significance at the one-tailed level.

decomposed consistent with Aiken and West (1991). Specifically, the interactions' simple slopes were analyzed for each experimental variable at low (-1 *SD*), mean, and high (+1 *SD*) levels of dominance across all three messages. Table 5.3 presents the results of the unstandardized coefficients and statistical significance tests for the simple slopes, and Figure 5.2 presents graphs of the interactions.

Decomposition of significant repeated measures interaction effects for each individual message resulted in both significant and nonsignificant effects at the message level. That is, some interactions that were significant in the repeated measures analysis were not significant at the individual message level. This is possible because some messages, but not all, convey most of the interaction effect, and this effect is strong enough to emerge in the repeated measures analyses. Another possibility is that a consistent effect across all three messages compounds at the repeated measures level, thereby creating significance, although the effect is not great enough within individual messages to be significant. Thus, some individual messages do not possess a significant interaction despite a significant repeated measures interaction (see Table 5.3). In such cases, interpretation of the repeated measures interaction is typically limited to the significant message-level interaction, but similar patterns (even when nonsignificant) across all three messages are noted. The patterns are visually represented in Figure 5.2.

Before the decomposed interactions are discussed, consider a final interpretive point about the slopes reported in Table 5.3. Some nonsignificant interactions have significant slopes among people of high and low dominance (e.g., the participant dominance by benefit frame interaction on perceived source benefit for Message 2, *p*

Table 5.3. *Simple Slope Conditional Effects Predicting Dependent Variables at Different Levels of Participant Dominance*

Interaction	Dependent Variable		*B* for interaction	*p* of interaction	R^2 for interaction	Low Dominance (-1 *SD*)		Mean Dominance		High Dominance (+1 *SD*)	
Participant Dominance X Benefit Condition (0=Target, 1=Source)						B	*t*	B	*t*	B	*t*
	Perceived source benefit										
		Message 1	-0.26	.052	.01	2.52	11.32***	2.21	14.07***	1.90	8.55***
		Message 2	-0.22	.071	.00	3.41	16.60***	3.15	21.69***	2.88	14.03***
		Message 3	-0.28	.047	.01	2.54	11.45***	2.23	14.22***	1.92	8.62***
	Social Attractiveness										
		Message 1	0.16	.089	.01	-0.57	-3.57***	-0.38	-3.34***	-0.18	-1.15
		Message 2	0.26	.014	.02	-0.71	-4.18***	-0.42	-3.45***	-0.12	-0.69
		Message 3	0.01	.88	.00	0.04	0.24	0.06	0.49	0.08	0.44
	Grade										
		Message 1	1044.71	.49	.00	-7717.10	-3.12**	-6498.10	-3.72***	-5279.09	-2.13*
		Message 2	3555.38	.027	.02	-7275.20	-2.75**	-3111.15	-1.67 *[a]	1052.90	0.39
		Message 3	28.13.82	.069	.02	-1971.16	-0.77	1324.38	0.74	4619.92	1.81*[a]
Participant Dominance X Symmetry Condition (1 = Asym, 2=Sym)											
	Message quality										
		Message 1	-0.29	.043	.01	0.47	1.97*	0.13	.45	-0.22	-0.91
		Message 2	0.04	.77	.00	-0.11	-0.48	-0.07	-0.40	-0.02	-0.08
		Message 3	-0.25	.048	.01	0.20	0.94	-0.10	-0.65	-0.39	-1.88*[a]
Participant Dominance X Benefit X Symmetry[b]											
	Positive Affect										
		Message 1	-0.82	.002	.03	1.34	3.02**	0.37	1.21	-0.59	-1.34
		Message 2	-0.15	.60	.00	-0.16	-0.35	-0.33	-1.03	-0.50	-1.10
		Message 3	-0.14	.558	.00	-0.11	-0.28	-0.27	-0.99	-0.43	-1.12

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level. [a]Indicates significant at the one-tailed level.

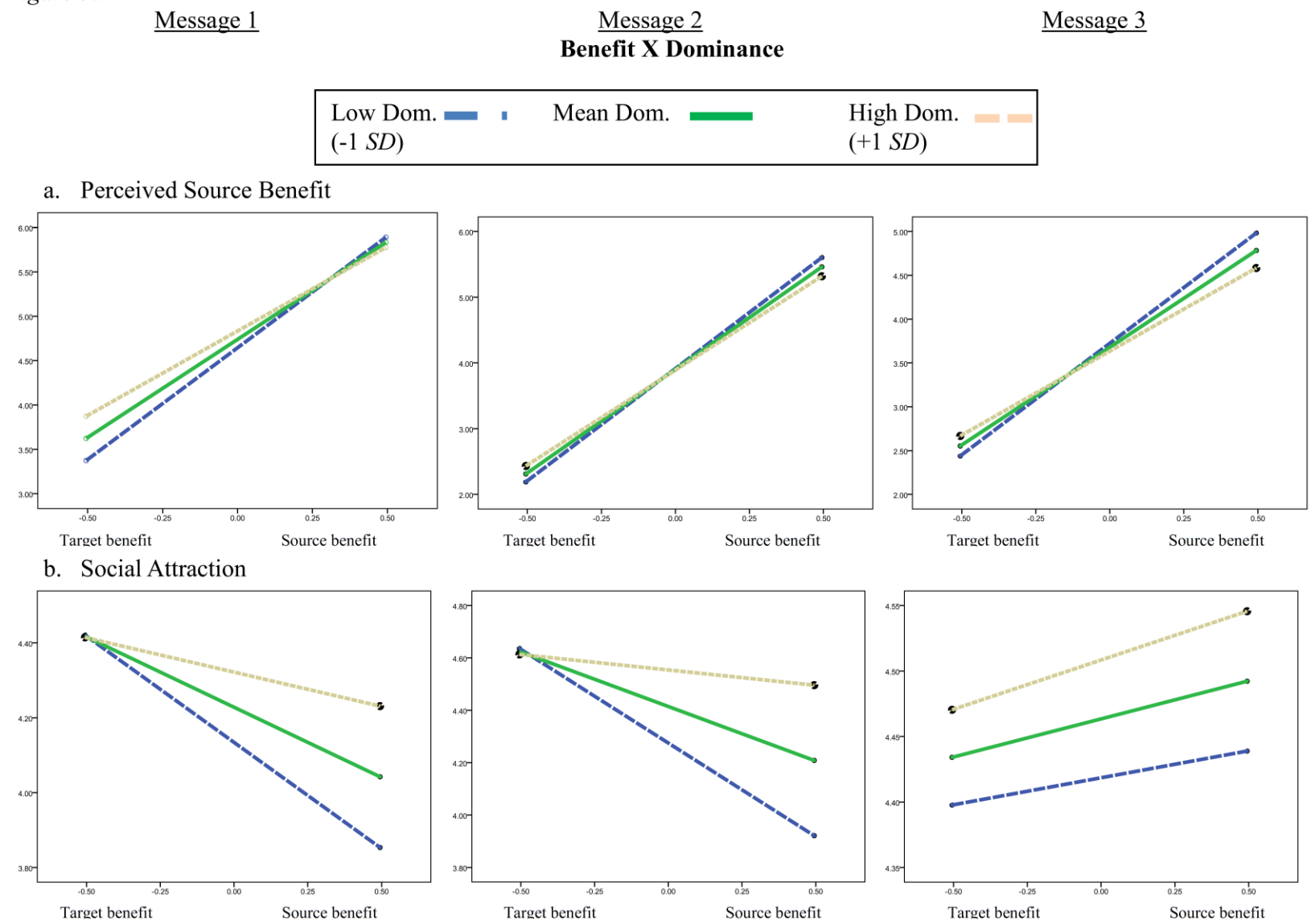
[b] Group slopes for three-way interaction are reported within the text. Slopes reported indicate effect of Benefit by Dimorphism interaction at different levels of dominance.

= .07). Significant slopes occur when participants indicate significant differences between source and target benefit messages. Unless these slopes significantly differ, a main effect for benefit frame can occur among participants with varying degrees of dominance without also interacting with dominance. Significant interactions indicate that the slopes differ for people of varying dominance, and these effects are used to interpret interaction effects between experimental variables and participant dominance.

Symmetry by dominance. One significant two-way interaction between symmetry and dominance was found for message quality (η^2 = .01; see Table 5.2 and Figure 5.2d). In particular, people with low dominance perceived messages having higher quality coming from symmetrized rather than asymmetrical faces (B_{M1} = 0.47, $p < .05$; B_{M3} = 0.20, $p = ns$), whereas people with high dominance perceived messages having lower quality coming from symmetrized rather than asymmetrical faces (B_{M1} = -0.22, $p = ns$; B_{M3} = -0.39, $p < .05$, one-tailed). This interaction was significant in Message 1 and 3 (see Table 5.3).

Benefit frame by dominance. A significant two-way interaction between benefit frame and dominance was found for perceived source benefit (η^2 = .02), social attraction (η^2 = .01), and grade (η^2 = .02; see Table 5.2). First, people with low dominance perceived the target benefit message as less beneficial to the source and the source benefit message as more beneficial to the source (B_{M1} = 2.52, $p < .001$; B_{M2} = 3.41, $p < .001$; B_{M3} = 2.54, $p < .001$) compared to those higher in dominance (B_{M1} = 1.90, $p < .001$; B_{M2} = 2.88, $p < .001$; B_{M3} = 1.92, $p < .001$; see Figure 5.2a). That is, those lower in dominance perceived greater differences between cues in the messages

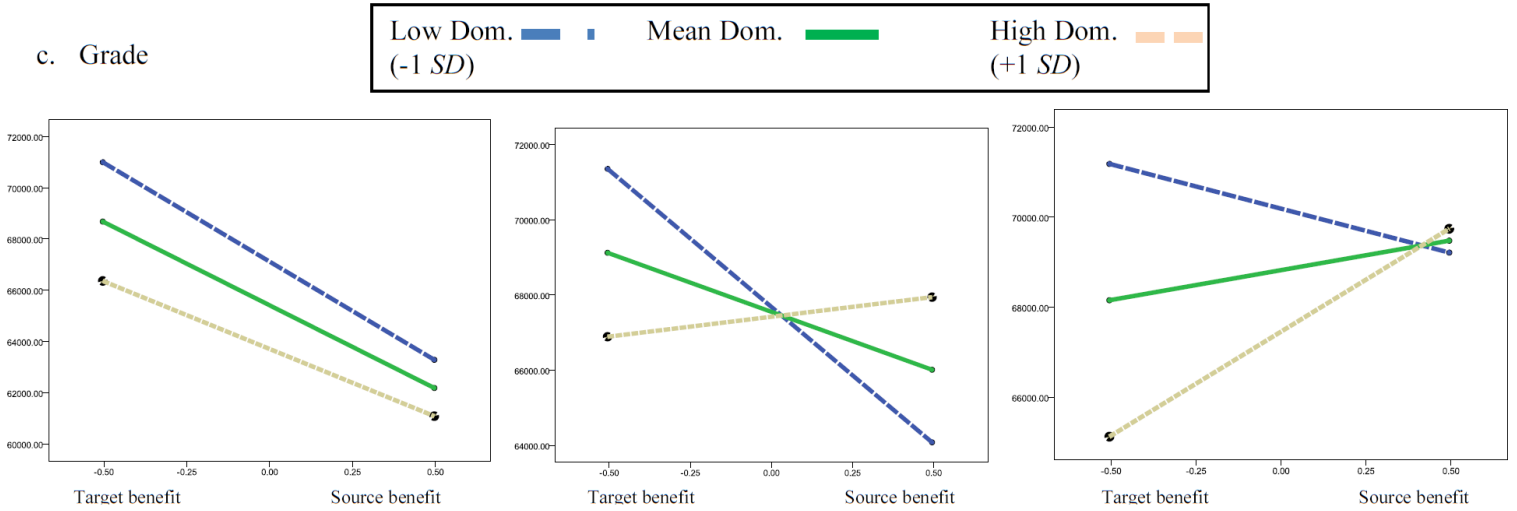
Figure 5.2


Message 1
Message 2
Message 3
Benefit X Dominance
Low Dom. (-1 SD)
Mean Dom.
High Dom. (+1 SD)
a. Perceived Source Benefit
Target benefit
Source benefit
b. Social Attraction
Target benefit
Source benefit

Message 1 Message 2 Message 3

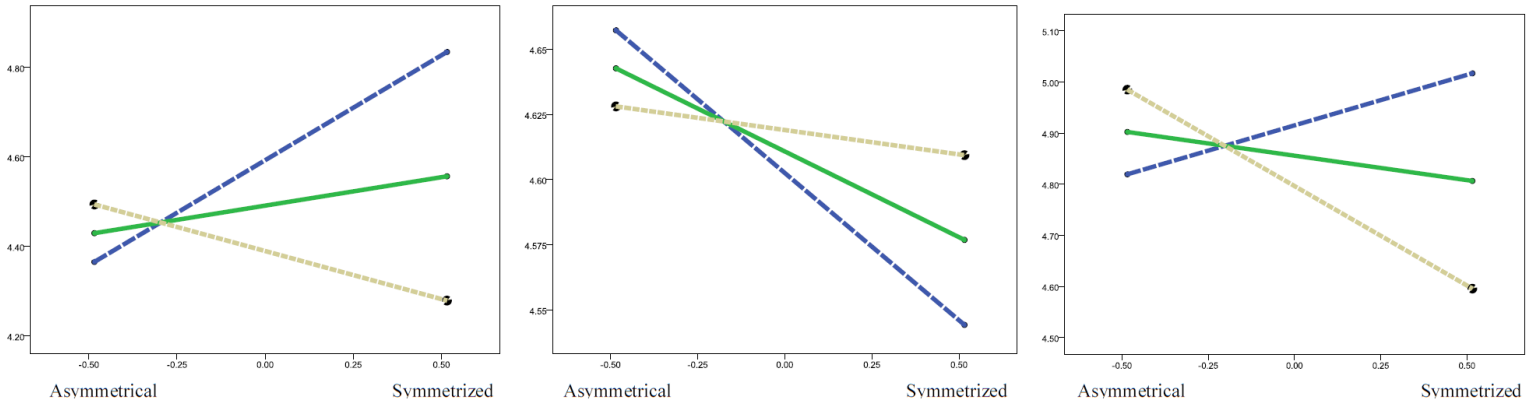
Benefit X Dominance (cont.)

c. Grade



Symmetry X Dominance

d. Message Quality



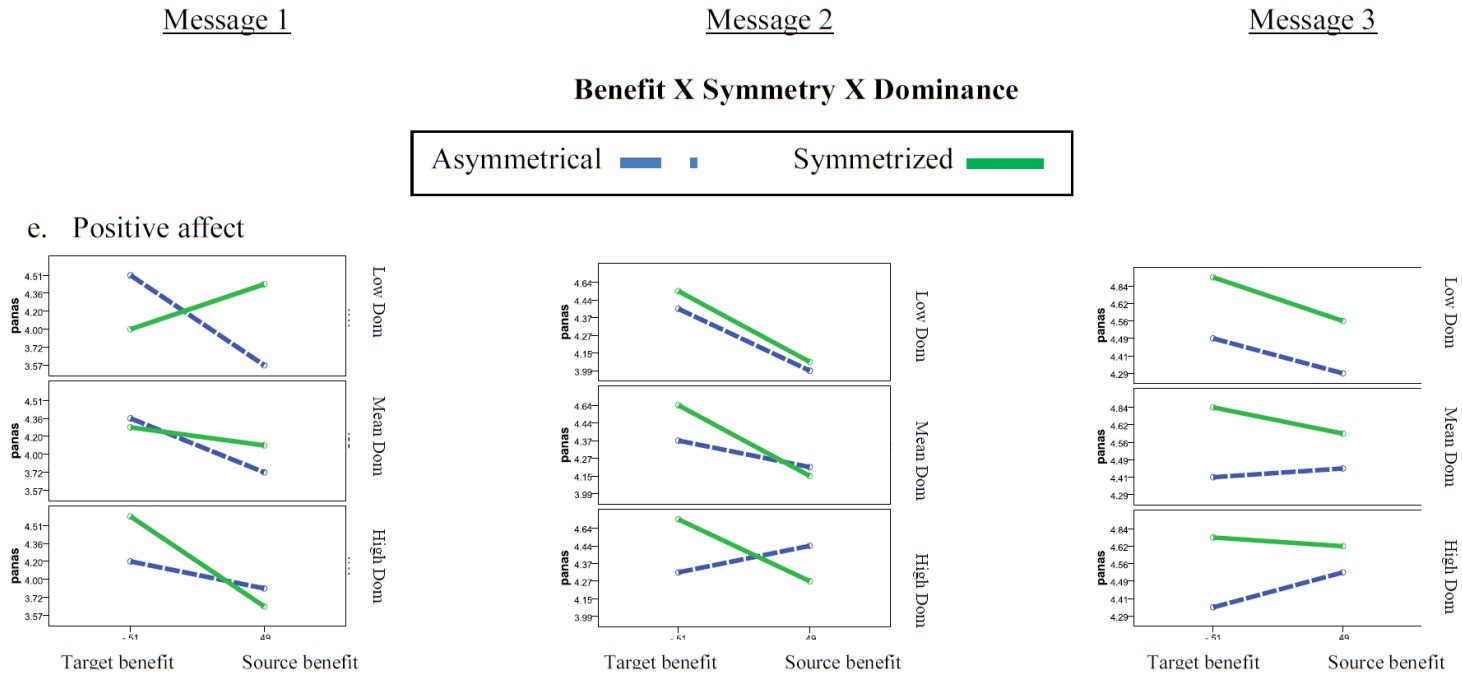


Figure 5.2. Significant repeated measures ANOVA interactions decomposed across individual messages.

that indicate the self-interest of the source. This effect was significant across all three messages (see Table 5.3). Second, people low in dominance experienced reductions in social attraction toward a selfish source compared to a selfless source (B_{M1} = -0.57, $p < .001$; B_{M2} = -0.71, $p < .001$) at a greater rate than did those high in dominance (B_{M1} = -0.18, $p = ns$; B_{M2} = -0.12, $p = ns$). That is, as people increased in dominance, the more attraction they experienced toward a self-interested source, whereas no differences existed in attraction to other-interested sources (see Figure 5.2b). Other interested sources (i.e., those whose message took a target benefit frame) were also more socially attractive than self-interested sources for participants low in dominance. This effect was significant in Messages 1 (one-tailed) and 2 (see Table 5.3). Finally, people with low dominance assigned a lower grade to the source benefit message and a higher grade to the target benefit message (B_{M2} = -7275.20, $p < .01$), whereas people with high dominance assigned a higher grade to the source benefit message and a lower grade to the target benefit message (B_{M2} = 1052.90, $p = ns$; see Figure 5.2c). That is, those with lower dominance evaluated selflessness more favorably, whereas those with higher dominance evaluated selfishness more favorably. This effect was significant in Message 2 and marginally significant for Message 3 (one-tailed) in which the same pattern was apparent (see Table 5.3).

Symmetry by benefit frame by dominance. A significant three-way interaction was found for positive affect between benefit frame, symmetry, and participant dominance ($\eta^2 = .01$; see Table 5.2 and Figure 5.2e). It appears that Message 1 primarily served as the impetus for the significant repeated measures effect (see Table 5.3). People low in dominance experienced greater positive affect

after exposure to other-interested asymmetrical sources compared to self-interested asymmetrical sources (B_{M1} = -0.94, $p < .01$). However, as dominance increased, this effect attenuated for Message 1 and even reversed for Messages 2 and 3: People high in dominance experienced greater positive affect after exposure to self-interested asymmetrical sources compared to other-interested asymmetrical sources (B_{M1} = -0.34, $p = ns$). Effects of benefit frame were different for symmetrized faces: People low in dominance experienced greater positive affect after exposure to self-interested symmetrized sources compared to other-interested symmetrized sources (B_{M1} = 0.40, $p = ns$; see Figure 5.2e, Message 1). However, people high in dominance experienced greater positive affect after exposure to other-interested symmetrized sources compared to self-interested symmetrized sources (B_{M1} = -0.93, $p < .01$).

Overall, ANCOVAs provided little evidence was found to support the hypothesized three-way interaction between benefit frame, facial symmetry of sources, and participant dominance. Simply put, the interaction did not significantly predict attitude or the intervening variables. The one exception was that positive affect was predicted by a three-way interaction. Here, less dominant people felt more positive after exposure to messages from selfish rather than from selfless symmetrized sources (*H1a*), whereas they felt more positive by selfless than from selfish asymmetrical sources (*H1b*). In addition, more dominant people felt less positive after exposure to messages from selfish than from selfless sources regardless of facial symmetry (significant for Message 1). These results closely aligned with the hypothesis. With the exception of the results pertaining to positive affect providing partial support, the interaction was not significant for other source or message

attributions. Most important, the interaction did not significantly predict attitude. Thus, *H1* received very minimal support.

Despite a rejected hypothesis, other significant results indicate how participant dominance, source symmetry, and source selfishness function to affect persuasion. Importantly, less dominant people perceived messages coming from symmetrized sources as higher quality, but more dominant people perceived messages coming from asymmetrical sources as higher quality. Less dominant people appeared to be more perceptive of communicated beneficence, because they perceived target benefited messages as less beneficial to the source and source benefited messages as more beneficial to the source than did more dominant people. The reduction in social attractiveness between a selfless and selfish source was smaller for people higher in dominance, ostensibly because they are less threatened by a selfish source. Finally, more dominant people evaluated the selfish message more positively than the selfless message, whereas less dominant people evaluated the selfless message more positively than the selfish message.

Finally, planned comparisons were conducted to test the specific hypothesized three-way interaction. Planned comparisons in repeated measures ANOVAs resulted in significant effects of the ordinal contrast predictor for a number of dependent variables (with 1 between degrees of freedom and 285 within degrees of freedom). In particular, the contrast was significant for perceived source benefit ($F = 14.41$, $p = .000$, partial $\eta^2 = .05$), perceived target benefit ($F = 8.30$, $p = .004$, partial $\eta^2 = .03$), perceived benefit to the average UMD student ($F = 15.92$, $p = .000$, partial $\eta^2 = .05$), competence ($F = 4.74$, $p = .03$ one-tailed, partial $\eta^2 = .02$), goodwill ($F = 7.90$, p

=.005, partial η^2 = .03), trustworthiness (F = 11.05, p =.001, partial η^2 = .04), direct attitude (F = 4.25, p =.04, partial η^2 = .02), quasi-direct attitude (F = 6.17, p =.01, partial η^2 = .02), issue importance (F = 2.97, p =.043 one-tailed, partial η^2 = .01), message quality (F = 6.63, p =.01, partial η^2 = .02), and message realism (F = 3.96, p =.04, partial η^2 = .01). Among these variables, the hypothesized interaction significantly represented differences in attributions between groups after exposure to persuasive messages. Of the eighteen contrasts tested, eleven (61%) were significant. The planned contrast provides further support for the interaction expressed in the three hypotheses.

Model Testing

Confirmatory factor analysis. The CFAs showed acceptable multigroup model fit with constrained measurements between groups of participants who were low and high in dominance: Message 1, χ^2 (1704) = 2820.49, p < .001, RMSEA = .067, 90% CI = (.063, .072), CFI = .97, SRMR = .07; Message 2, χ^2 (1704) = 2909.39, p < .001, RMSEA = .070, 90% CI = (.066, .074), CFI = .97, SRMR = .08; and Message 3, χ^2 (1704) = 2809.70, p < .001, RMSEA = .067, 90% CI = (.062, .071), CFI = .97, SRMR = .10.

Theoretical model testing. As detailed in Chapter 4, multigroup model testing occurred in three steps. First, the unconstrained multigroup models were run for those above and below median dominance, resulting in appropriate fit: Message 1, χ^2 (1629) = 2847.70, p < .001, RMSEA = .072, 90% CI = (.067, .076), CFI = .96, SRMR = .06; Message 2, χ^2 (1629) = 3094.42, p < .001, RMSEA = .079, 90% CI = (.075, .084), CFI = .96, SRMR = .13; and Message 3, χ^2 (1629) = 2861.62, p < .001,

RMSEA = .073, 90% CI = (.068, .077), CFI = .96, SRMR = .09. Second, the models were then run with all structural parameters constrained to be equal for both groups, resulting in appropriate fit: Message 1, χ^2 (1672) = 2917.03, $p < .001$, RMSEA = .072, 90% CI = (.068, .077), CFI = .96, SRMR = .07; Message 2, χ^2 (1672) = 3055.45, $p < .001$, RMSEA = .076, 90% CI = (.072, .080), CFI = .967, SRMR = .08; and Message 3, χ^2 (1672) = 2925.82, $p < .001$, RMSEA = .072, 90% CI = (.068, .077), CFI = .96, SRMR = .09. Finally, modification indices were iteratively consulted and significantly different parameters between groups freed. This procedure resulted in Message 1 differences between people low and high in dominance for the path from source symmetry to message quality and the path from message benefit frame to social attraction. The final model reflected these freed parameters, and resulted in appropriate fit, χ^2 (1670) = 2896.15, $p < .001$, RMSEA = .070, 90% CI = (.067, .076), CFI = .96, SRMR = .07. Messages 2 and 3 did not exhibit significant differences in parameters between those low and high in dominance.

Fit statistics resulted in appropriately fitting models. The incremental fit indices of CFI demonstrated good fit (i.e., $\geq .95$; Hu & Bentler, 1999). The parsimony-adjusted measure, RMSEA, resulted in good (i.e., .05 - .08) to mediocre (i.e., .08 - .10) fit (MacCallum, Browne, & Sugawara, 1996). The absolute fit indices of SRMR also resulted in good fit (i.e., $\leq .09$). Overall, the models fit the data acceptably well. The standardized structural parameters are reported in Table 5.4. Significant parameters are flagged within the table, and significant differences between groups of low and high dominant individuals are indicated. In addition,

graphs of the models' significant parameters are found in Figures 5.3 (for Message 1), 5.4 (for Message 2), and 5.5 (for Message 3).

The model for each message exhibited significant effects of exogenous and intervening variables. Overall, the proportion of variance explained in attitude was .46 for Message 1, .54 for Message 2, and .30 for Message 3. Despite the significant parameters detailed below, the models provide little evidence for a consistent effect of source symmetry on attitude according to *H1*. That is, the models primarily resulted in different significant paths across message repetitions.

The exogenous variable of source symmetry exhibited some significant effects (i.e., significant gamma paths) across messages. For Message 1, facial symmetry significantly increased attributions of goodwill (unstandardized $\gamma = 0.43$), positive affect ($\gamma = 0.25$, one-tailed), and, for those low in dominance, message quality ($\gamma = 0.72$). Symmetry did not have a direct effect on attitude, but for those low in dominance, it did have a significant unstandardized indirect effect of 0.45. For Message 2, facial symmetry significantly increased attributions of goodwill ($\gamma = 0.35$), trustworthiness ($\gamma = 0.18$, one-tailed) and similarity ($\gamma = 0.28$, one-tailed), but did not directly or indirectly affect attitude. For Message 3, facial symmetry significantly increased attributions of goodwill ($\gamma = 0.23$, one-tailed), trustworthiness ($\gamma = 0.21$, one-tailed), similarity ($\gamma = 0.38$), and positive affect ($\gamma = 0.34$), but did not directly or indirectly affect attitude. Symmetry increased attributions of goodwill in all three messages.

Table 5.4. *Experiment 1 Structural Equation Unstandardized Parameter Estimates*

	Message 1				Message 2				Message 3			
	γ Benefit	γ Symmetry	γ Inter.	β	γ Benefit	γ Symmetry	γ Inter.	β	γ Benefit	γ Symmetry	γ Int.	β
Likability	-0.44***	0.13	-0.14	-0.18	-0.46***	0.10	-0.27*	0.11	0.06	0.12	-0.04	-0.10
R^2	.05				.07				.00			
Social attraction	-0.59***/ -0.02	-0.08	-0.00	0.19	-0.37**	0.15	-0.33*	0.23	0.11	0.04	-0.01	-0.13
R^2	.09/.00				.05				.00			
Physical attraction	-0.18*[a]	-0.04	0.15	-0.43***	0.03	0.03	0.02	0.22	0.11	0.05	0.06	-0.06
R^2	.02				.00				.00			
Task attraction	-0.28**	-0.03	-0.25*	-0.14	-0.07	0.03	-0.22*	-0.04	0.11	0.03	-0.10	-0.15
R^2	.04				.01				.01			
Competence	-0.34**	0.15	-0.13	-0.44	-0.07	0.05	-0.02	-1.43**	-0.03	0.09	0.02	-0.37
R^2	.05				.00				.00			
Goodwill	-1.13***	0.43**	-0.39*	0.02	-0.81***	0.35*	-0.19	-0.14	-0.48***	0.23*[a]	-0.09	-0.13
R^2	.20				.11				.06			
Trustworthiness	-0.43***	0.13	-0.18*[a]	0.72*	-0.32***	0.18*[a]	-0.03	1.30**	-0.06	0.21*[a]	0.04	0.80*[a]
R^2	.08				.05				.01			
Similarity	-0.36*	0.24	-0.22	-0.13	-0.53***	0.28*[a]	-0.23	0.04	-0.13	0.38*	-0.08	0.08
R^2	.03				.05				.03			
Positive affect	-0.42**	0.25 *[a]	-0.09	-0.19	-0.29*[a]	0.17	-0.25	0.11	-0.15	0.34*	-0.04	0.08
R^2	.04				.02				.03			
Message quality	-0.48**	0.72*** / -0.10	-0.32*[a]	0.76***	-0.02	-0.05	-0.12	0.71***	-0.06	0.00	-0.07	0.42***
R^2	.10 / .04				.00				.00			
Attitude	-0.11	0.00	-0.10		-0.46*	0.16	0.03		0.14	-0.18	-0.07	
R^2	.46				.54				.30			
Attitude (indirect effect)	-0.34*/ -0.23	0.45** /-0.17	-0.29*		-0.39*	0.16	-0.19		-0.07	0.14	0.02	

Note. γ indicates path emerging exogenous variable. β indicates path emerging from intervening variable and ending in the endogenous variable (i.e., attitude). Significant differences resulted from multigroup analyses are separated by a slash (low dominance / high dominance). Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

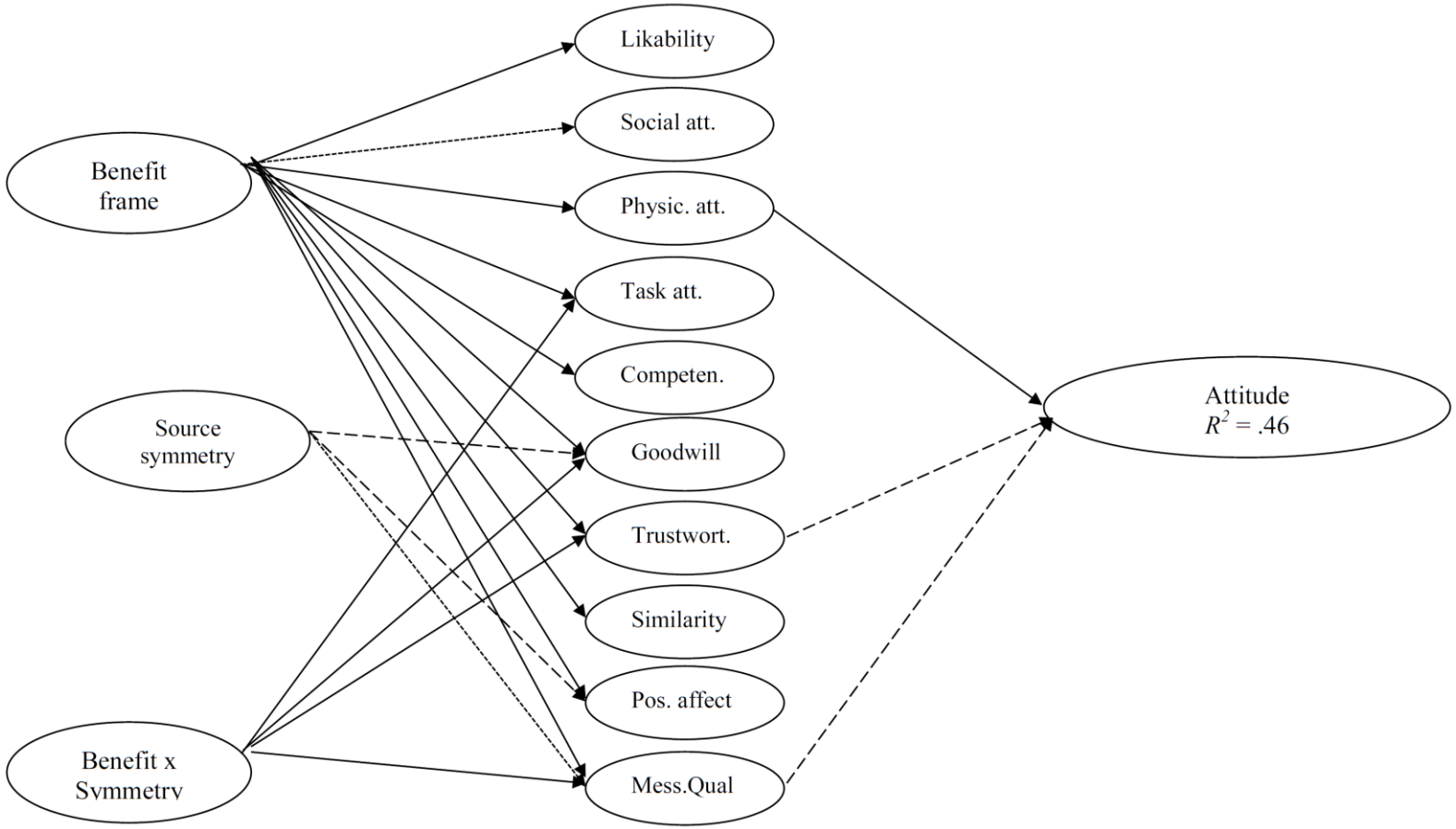


Figure 5.3. Experiment 1 structural model for Message 1.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters. Dotted lines indicate parameters that differed for participants who were high and low in dominance.

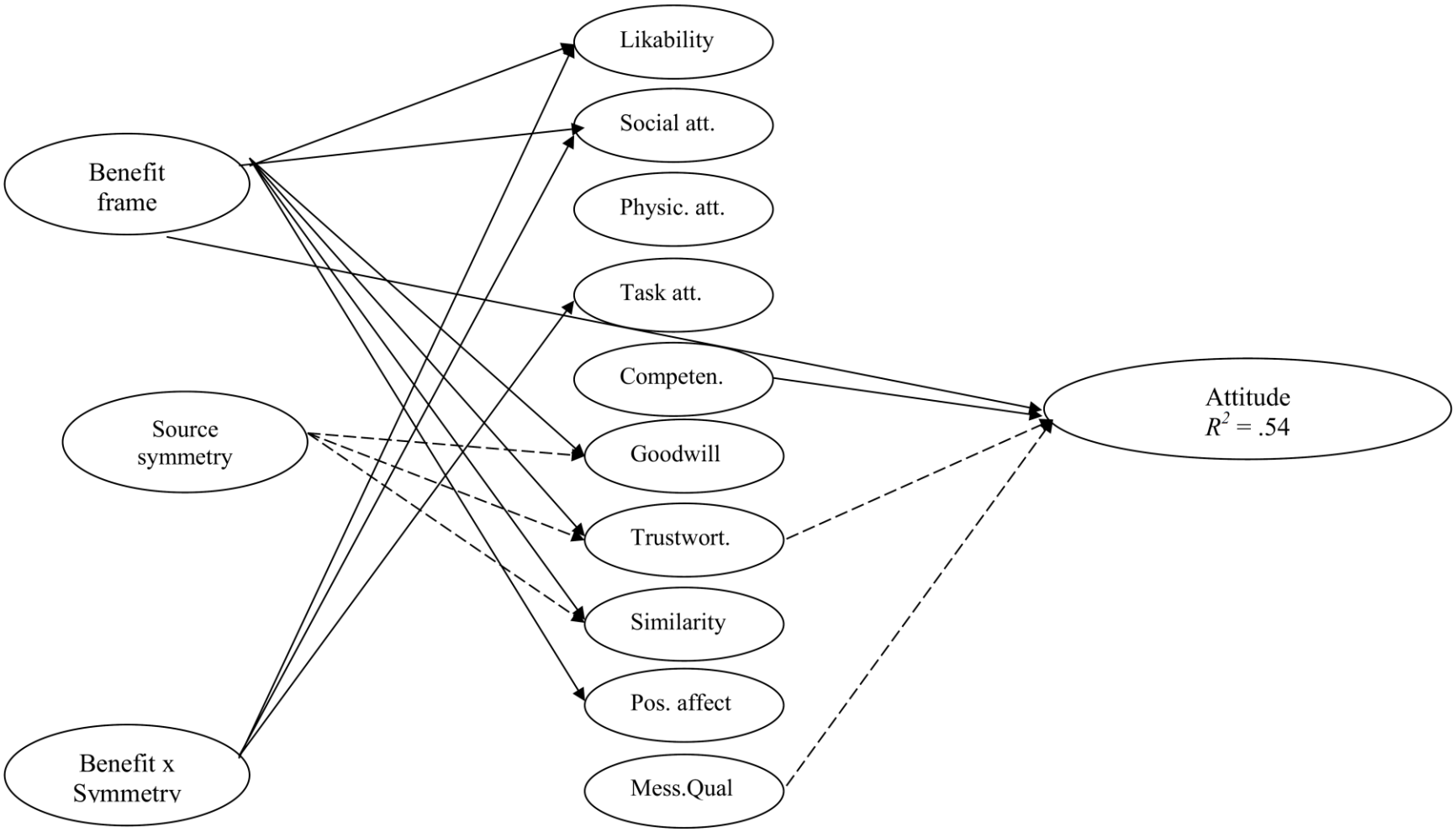


Figure 5.4. Experiment 1 structural model for Message 2.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters.

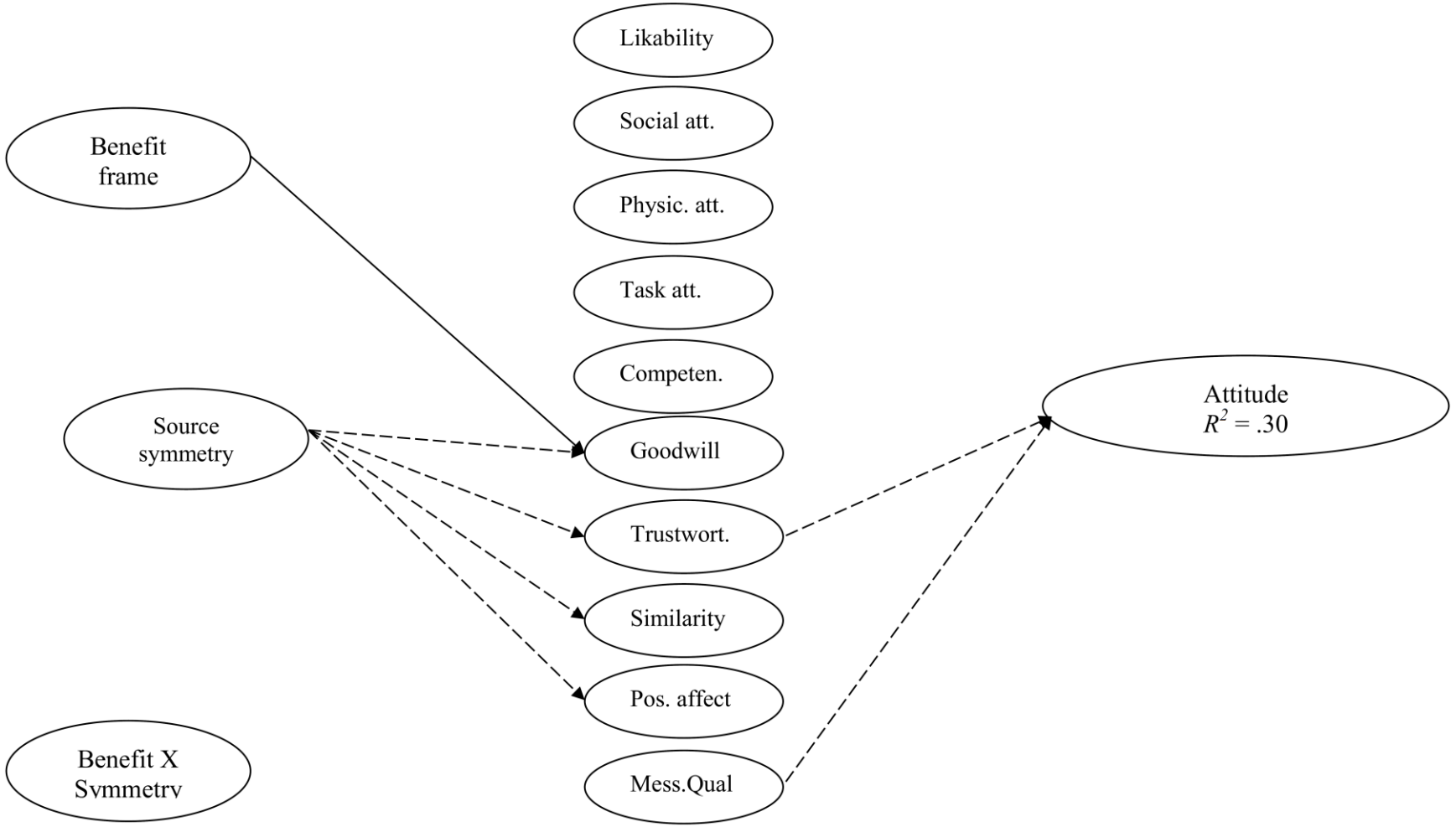


Figure 5.5. Experiment 1 structural model for Message 3.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters.

The exogenous variable of message benefit frame had some significant effects (i.e., significant paths) across messages. Source selfishness significantly decreased attributions of likability (γ_{M1} = -0.44, γ_{M2} = -0.46), social attraction (γ_{M1} = -0.59 for those low in dominance, γ_{M2} = -0.37), physical attraction (γ_{M1} = -0.18), task attraction (γ_{M1} = -0.28), competence (γ_{M1} = -0.34), goodwill (γ_{M1} = -1.13, γ_{M2} = -0.81, γ_{M3} = -0.48), trustworthiness (γ_{M1} = -0.43, γ_{M2} = -0.32), similarity (γ_{M1} = -0.36, γ_{M2} = -0.53), positive affect (γ_{M1} = -0.48), and message quality (γ_{M1} = -0.48). Source selfishness significantly decreased attitude directly (γ_{M2} = -0.46) and indirectly (γ_{M2} = -0.39) for Message 2, and indirectly for Message 1 for those low in dominance (γ_{M1} = -0.34). Selfishness decreased attributions of goodwill in all three messages.

The interaction between symmetry and benefit frame also had some significant effects. The interaction was calculated by multiplying the dummy coded experimental variables, symmetry (0 = *asymmetrical face*, 1 = *symmetrized face*) and benefit frame (0 = *target benefit*, 1 = *source benefit*). The interaction significantly affected intervening variables in Messages 1 and 2, including likability (γ_{M2} = -0.27), social attraction (γ_{M2} = -0.33), task attraction (γ_{M1} = -0.25, γ_{M2} = -0.22), goodwill (γ_{M1} = -0.39), trustworthiness (γ_{M1} = -0.18, one-tailed), and message quality (γ_{M1} = -0.32, one-tailed). The interaction in Message 1 exhibited a significant indirect effect on attitude (γ_{M1} = -0.29). Overall, the interaction inconsistently predicted source and message attributions as well as attitude. Also important, the interaction did not significantly differ for groups with different levels of dominance, providing no support for the hypothesized three-way interaction. These results give further reason to reject *H1*.

A few intervening variables significantly predicted attitude. Sources that were higher in perceived trustworthiness (unstandardized $\beta_{M1} = 0.72$, $\beta_{M2} = 1.30$, $\beta_{M3} = 0.80$, one-tailed) and messages that were higher in perceived quality ($\beta_{M1} = 0.76$, $\beta_{M2} = 0.71$, $\beta_{M3} = 0.42$) increased attitude change. Somewhat surprisingly, attitude change was hindered when sources were perceived as physically attractive ($\beta_{M1} = -0.43$) or competent ($\beta_{M2} = -1.43$). Overall, significant effects of intervening variables provided little consistent evidence that attributions mediate the effect of source cue on attitude. The one exception was that, in Messages 2 and 3, facial symmetry significantly affected trustworthiness, and perceptions of trustworthiness significantly predicted attitude. However, indirect effects of symmetry on attitude were not significant for these messages.

On the whole, the structural equation models are generally consistent with the conclusions made from the ANCOVAs: Exogenous variables, both in isolation and in varying interactive combinations, exhibited limited significant effects on attitude and intervening variables, but the effects between messages showed little consistency. Further, the hypothesized three-way interaction on attitude was not significant. Taken as a whole, these results provide little evidence to suggest that facial similarity affected persuasion according to the evolutionary predictions.

Discussion

The evidence suggests that a source's facial symmetry does not function to affect persuasion in accordance with the predictions previously put forward. The expected relationships were not found for attitude or for the vast majority of measured variables. Although symmetry had a significant indirect effect on attitude

among people low in dominance for Message 1, this effect did not replicate for the other messages. To be clear, with the exception of positive affect about the message, facial symmetry did not appear to affect persuasion or its cognitive and affective corollaries as expected. Still, a number of variables were significantly predicted by some combination of experimental manipulations even if they did not fully support the hypothesized three-way interaction. Even in cases in which effects were significant, explained variance attributable to the independent variables was small and should be interpreted with caution. These significant effects are presently discussed.

The significant results give some reason to believe that facial similarity serves as a cue to affect cognitions relevant to persuasive situations and assessments of persuasive sources and messages. The repeated measures three-way interaction of symmetry, benefit, and participant dominance on positive affect closely aligned with the hypothesis. Here it appeared that less dominant people felt more positive toward selfish symmetrical sources than toward selfless ones (*H1a*) and felt more positive toward selfless asymmetrical sources than toward selfish ones (*H1b*), whereas highly dominant people felt more positive toward selfless, rather than selfish, symmetrical (and to a lesser extent, asymmetrical) sources (*H1c*). That only positive affect, and not attitude or additional appraisals of the source or message, was influenced in this way may suggest that the theorized evolutionary nature of persuasive source effects influences emotional, rather than cognitive, responses to interpersonal communications. Indeed, persuasive cues processed heuristically are thought to "trigger relatively primitive affective states" (Petty & Cacioppo, 1981, pp. 34-35), leading toward persuasion via means other than effortful processing.

Further, source symmetry and participant dominance had a significant interactive effect on perceived message quality, a variable that has been shown to be closely related to attitude change (Dillard, Shen, & Grillova Vail, 2007). Less dominant people assessed messages from symmetrical sources as providing higher quality persuasive messages than from asymmetrical sources (partially supportive of *H1a* because of the same effect across both benefit frames instead of with only selfish messages), whereas more dominant people assessed messages from asymmetrical sources as providing higher quality messages than from symmetrical sources (although no difference was hypothesized). Here we see how a seemingly imperceptible cue—after all, assessments of attraction did not differ based on facial symmetry—influenced message-relevant cognitions. On the one hand, given the nonsignificant manipulation check of symmetry on physical attractiveness, this effect may be an artifact that capitalized on Type 1 error (although a single significant finding still surpasses what would be expected by chance for the eighteen measured variables). On the other hand, the fitness-signaling cue of symmetry appeared to lead toward differential assessments of message quality based on the dominance of the target. Less dominant people perceive arguments as better quality when they come from symmetrical sources, whereas more dominant people may feel threatened by such sources and judge the arguments to be worse. That message quality significantly predicted attitude in the structural models suggests that this link warrants further investigation.

Finally, although the finding does not bear on the efficacy of facial symmetry, dominance and message benefit frame significantly interacted to affect perceptions of

the source and message. It seems that less dominant people are more perceptive of verbal message cues that could signal potential source threats. First, they more accurately assessed the benefit to source in the benefit frame condition compared to more dominant people. Second, they experienced a greater drop in social attraction from a selfless to a selfish source compared to dominant people. Less dominant people are more likely to perceive communicated cues to selfishness and are more affected by such cues in perceptions of attraction. Although this interaction was expected among nonverbal facial stimuli, it appears that verbal differences in source message can elicit similar effects.

Although limited support was found in ANCOVAs that tested the factorial design, planned comparisons provided more support for the predicted relationships. The planned comparison used to test the specific hypothesized three-way interaction resulted in a number of significant contrasts. These results provide reason to believe that the relationships between source symmetry, communicated goodwill, and participant dominance functioned according to predictions. Of note, apparent cognitive responses to the source and message, rather than affective ones, were significantly predicted by the contrast. In particular, the contrast predicted perceptions of source credibility dimensions, message quality, and attitudes, but did not predict liking for or attraction toward the source or message. Thus, cognitive appraisals were in line with the hypotheses, but affective ones were not.

Structural equation modeling provided little consistent evidence that facial symmetry influenced attitude either directly or indirectly. Although the symmetrized condition, compared to the asymmetrical condition, indirectly increased attitude

change in Message 1 for those low in dominance, it did not in Messages 2 or 3. Significant mediation effects also appear absent for the most part. These results suggest that even when facial symmetry significantly affected attributions regarding a source, these attributions did not translate into changes in attitude. Facial symmetry influences some cognitive variables related to persuasion without seemingly affecting persuasion. This result does not support an evolutionary explanation to social influence whereby attitudes are directly dependent on a source's facial similarity.

Chapter 6: Experiment 2

The purpose of this study was to assess whether sexual dimorphism of a source's face and the communicated benefit frame in a message affect attitude change in targets with varying degrees of dominance. It was hypothesized that a source's facial masculinity would interact with benefit frame and participants' dominance. In particular, less dominant participants in the source benefit message condition, compared to the target benefit message condition, will be better persuaded by masculine faces. Less dominant participants in the target benefit message condition, compared to the source benefit message condition, will be better persuaded by feminine faces. Finally, participants high in dominance will be less persuaded by source benefit messages than from target benefit messages regardless of the facial masculinity of the source.

Method

Participants

Participants (independent of those who participated in other experiments) were 278 students from a variety of communication courses who volunteered to participate in exchange for a small amount of extra credit. Thirty-nine percent were male and 61% were female. Participants were between 18 and 27 years old (M = 19.86, SD = 1.68). Participants self-reported their race as White (57%), Asian (18%) and African American (13%), with less than 6% in any other listed group. In a separate question, eight percent responded as being of Hispanic, Latino, or Spanish origin.

Experimental Stimuli

Three pairs of masculinized and feminized versions of photographed faces used in previously published sexually dimorphic face studies were used as stimuli in this research (see Figure 6.1; Jones, Little, Watkins, Welling, & DeBruine, 2011; Watkins, Jones, & DeBruine, 2010; Welling, Singh, Puts, Jones, & Burriss, in press). These image manipulations were previously created by morphing the face to be more or less prototypical of male or female faces. Prototypical face shapes for each sex were calculated by averaging a group of male or female feature points to identify the typical male or female face shape. These prototypical shapes were then used to modify an original photograph by taking the linear difference between feature points of the face with the prototype and warping the face with a greater or lesser percentage of the prototype. In all stimulus photographs, 50% of the linear difference in shape were added or subtracted to the faces to create remapped masculinized and feminized versions of the individual while retaining original skin color, texture, and other unique facial characteristics (Tiddeman, Burt, & Perrett, 2001; Welling et al., 2013).

The photograph sets were randomly paired with messages to serve as source cues to the within-subjects messages previously selected for inclusion in Experiment 2 (see Table 3.3). According to the labels in Figure 6.1, photograph set (a) was paired with a message about eliminating the distributive studies general education requirement (Message 6, hereafter referred to as Message 1), set (b) was paired with a message about the need for excused absences while traveling for religious observances (Message 5, hereafter referred to as Message 2), and set (c) was paired

(a)

(b)

(c)

Figure 6.1. Masculinized (left) and feminized (right) faces used in Experiment 2. (a) From Welling, Singh, Puts, Jones, and Burriss (in press), p. 3. (b) From Jones, Little, Watkins, Welling, and DeBruine (2011), p. 1282. (c) From Watkins, Jones, and DeBruine (2010), p. 969.

with a message about eliminating a rent-cap law for housing in the surrounding university area (Message 11, hereafter referred to as Message 3). Consistent with the repeated measures design for Experiment 1, each respondent read all three messages manipulated according to the same between-subject experimental condition, either framed as source benefit or target benefit and paired with a masculine or feminine source.

Unique Measures

Descriptive statistics of all measures in Experiment 2 appear in Table 6.1.

Source dominance manipulation check. Three semantic differential items assessed the perceived dominance of the source on a seven-point scale ("The person who gave this speech seems: *weak* vs. *strong*, *unassertive* vs. *assertive*, and *not to have a commanding presence* vs. *to have a commanding presence*").

Quasi-direct attitude measure. Three items were used after each speech to assess attitude toward the policy change: In Message 1 (e.g., "The university should extend the religious observance policy to allow students who live far from College Park to have excused travel days" and "Students who must travel long distances for religious observances should have excused travel days"), Message 2 (e.g., "Students should not be required to take courses to fulfill distribute studies credits" and "Distributive Studies requirements should be eliminated from the general education curriculum"), and Message 3 (e.g., "The 'rent-cap' law in College Park should be overturned" and "There should not be a law that puts a maximum rental amount on homes in College Park").

Table 6.1. *Experiment 2 Means, Standard Deviations, and Reliability Statistics*

Variable	# items	Message 1 M	Message 1 SD	Message 1 α	Message 2 M	Message 2 SD	Message 2 α	Message 3 M	Message 3 SD	Message 3 α
Dominance[a]	4	3.99	1.18	.82						
Perceived source benefit	3	3.78	1.92	.96	4.36	2.08	.98	4.38	1.97	.96
Perceived target benefit	3	4.97	1.39	.91	4.51	1.57	.94	4.67	1.93	.94
Perceived avg. student benefit	3	5.31	1.30	.96	4.84	1.51	.97	4.92	1.93	.96
Likability	4	4.94	1.01	.94	4.34	1.01	.94	4.39	1.05	.94
Social attraction	3	4.58	0.98	.88	4.17	1.06	.89	4.28	1.02	.88
Physical attraction	2	4.09	0.96	.87	3.93	0.94	.86	4.09	0.85	.87
Task attraction	3	4.55	0.93	.94	4.36	1.02	.92	4.28	1.01	.91
Competence	4	5.19	0.94	.88	5.01	1.08	.88	4.66	1.14	.89
Goodwill	3	5.14	1.25	.91	4.44	1.58	.95	4.47	1.40	.93
Trustworthiness	4	5.22	1.00	.90	4.80	1.02	.89	4.73	1.02	.91
Similarity	3	4.65	1.25	.93	4.02	1.28	.92	4.11	1.43	.94
Source dominance	3	5.05	0.97	.87	4.80	1.13	.86	4.74	1.09	.84
Positive affect	4	4.57	1.28	.92	4.07	1.28	.91	4.12	1.36	.92
Attitude, direct	4	2.98	1.71	.97	3.86	1.42	.95	4.41	1.43	.92
Attitude, quasi-direct	3	5.72	1.20	.96	4.38	1.30	.87	3.94	1.73	.97
Issue importance	3	4.53	1.62	.93	4.22	1.48	.92	5.00	1.39	.91
Message quality	3	4.90	1.22	.89	4.27	1.21	.86	4.17	1.37	.90
Message realism	3	5.29	1.00	.90	4.89	1.16	.92	5.13	1.06	.89
Grade[b]	1	87.03	8.45		83.74	10.94		82.61	10.93	

Note. [a] Participant dominance was assessed at a single time independent of the message repetitions, resulting in a single individual difference measurement. [b]Grade means and standard deviations reflect scores prior to transformation. Data analyses were conducted on grades after transformation consistent with Chapter 4 descriptions.

Results

The following repeated measures ANOVAs are reported in Table 6.2.

Manipulation Checks

Facial sexual dimorphism. The effect of the source's facial sexual dimorphism on perceived dominance was not successful, $F(1, 239) = 1.95$, $p = ns.$ That is, across messages, participants did not perceive the masculine sources to be more dominant than the feminine sources. This result suggests that the sexual dimorphism manipulation failed. However, given that facial sexual dimorphism may affect attitudes and source attributions independent of perceptions of dominance, further data analysis was warranted. That is, it was possible that participants were affected by sexual dimorphism in ways that altered the persuasiveness of the message besides through attribution of dominance.

Benefit frame. Repeated measures ANOVAs provided evidence to suggest benefit frame was successfully manipulated across within-participant cells. Participants who read the source benefit message perceived significantly greater source benefit compared to those who read the target benefit frame across messages, $F(1, 239) = 50.64$, $p < .001$, partial $\eta^2 = .18$. Similarly, the source benefit message elicited lower perceptions of target benefit, $F(1, 239) = 8.26$, $p < .01$, partial $\eta^2 = .03$, and average student benefit, $F(1, 239) = 6.02$, $p < .05$, partial $\eta^2 = .03$, compared to those who read the target benefit frame. Thus, the benefit frame manipulation was successful.

Table 6.2. *Experiment 2 Repeated Measures ANOVAs Between-Subjects Effects*

	Participant Dominance		Benefit Condition (0=target benefit, 1=source benefit)		Sex. Dimorph. Cond. (1=feminine, 2=masculine)		Benefit * Dimorph.		Benefit * Dominance		Dimorph. * Dominance		Benefit * Dimorph. * Dominance	
Dependent Variable	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2
Perceived source ben.	2.42	.01	50.64***	.18	1.73	.01	0.00	.00	3.35*[a]	.01	2.17	.01	.09	.00
Perceived participant ben.	3.58*[a]	.02	8.26**	.03	0.08	.00	0.64	.00	0.01	.00	0.36	.00	0.45	.00
Perceived avg. student ben.	2.02	.01	6.02**[a]	.03	1.78	.01	0.91	.00	0.08	.00	1.09	.01	0.32	.00
Likability	0.22	.00	0.60	.00	0.10	.00	3.76**[a]	.02	4.23*	.02	1.30	.01	5.33*	.02
Social attraction	0.07	.00	1.57	.01	0.42	.00	2.42	.01	4.81*	.02	2.11	.01	3.51*[a]	.01
Physical attraction	4.81*	.02	0.65	.00	0.46	.00	3.57*[a]	.02	1.25	.01	1.39	.01	3.32*[a]	.01
Task attraction	3.84*[a]	.02	0.00	.00	0.06	.00	.054	.00	1.03	.00	0.03	.00	1.09	.01
Competence	0.06	.00	0.07	.00	0.16	.00	0.70	.00	0.47	.00	0.49	.00	0.77	.00
Goodwill	0.06	.00	11.76***[a]	.05	0.10	.00	1.64	.01	0.18	.00	0.01	.00	1.12	.01
Trustworthiness	0.25	.00	0.09	.00	0.06	.00	1.28	.01	1.24	.01	0.12	.00	1.33	.01
Similarity	0.43	.00	0.11	.00	0.29	.00	2.01	.01	0.38	.00	0.00	.00	1.32	.01
Source dominance	0.26	.00	1.89	.01	1.95	.01	0.47	.00	3.98*	.02	2.06	.01	0.53	.00
Positive affect	0.45	.00	0.02	.00	0.07	.00	0.04	.00	0.19	.00	0.04	.00	0.17	.00
Attitude, direct	0.54	.00	0.58	.00	5.87**[a]	.02	0.00	.00	0.06	.00	5.45*	.02	0.07	.00
Attitude, quasi-direct	0.09	.00	0.02	.00	0.71	.00	0.06	.00	0.10	.00	0.44	.00	0.11	.00
Issue importance	0.05	.00	0.67	.00	1.18	.01	2.02	.01	0.22	.00	0.95	.00	1.30	.01
Message quality	0.19	.00	0.16	.00	0.10	.00	0.09	.00	0.29	.00	0.82	.00	0.01	.00
Message realism	1.25	.01	0.52	.00	3.62*[a]	.02	0.34	.00	2.02	.01	3.51*[a]	.01	0.77	.00
Grade (trans)	1.54	.01	0.43	.00	0.67	.00	2.05	.01	0.11	.00	0.01	.00	2.78*[a]	.01

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

Hypothesis Testing

A three-way interaction was expected whereby (a) less dominant people would be more persuaded—and have attributions associated with attitude change—from self-interested (i.e., communicated source benefit frame) sources with masculine faces compared to other-interested sources with masculine faces, (b) less dominant people would be more persuaded by other-interested sources with feminine faces compared to self-interested sources with feminine faces, and (c) dominant people would be less persuaded by self-interested sources compared to other-interested sources regardless of facial sexual dimorphism (*H2)*. Before this three-way interaction is evaluated, it is necessary to mention the main effects and two-way interactions.

Main effects. Facial dimorphism independently influenced two dependent variables. People exposed to masculine faces experienced less attitude change (η^2 = .02) compared to those exposed to feminine faces.

Benefit condition independently affected perceptions of the source and message (see Table 6.2). In addition to the aforementioned manipulation checks, those exposed to the source benefit message perceived the source to have less goodwill compared to those exposed to the target benefit message (η^2 = .05).

Finally, participant dominance served as a significant independent predictor for two dependent variables (see Table 6.2). In particular, participants who were more dominant experienced less physical (η^2 = .02) and task (η^2 = .02) attraction toward the source and perceived less target benefit in the message (η^2 = .01).

Interaction effects. A number of between-subjects repeated measures interaction effects were found (see Table 6.2). In cases in which both two-way and three-way interactions among independent variables were significant, only the three-way interaction was decomposed to explain the effect. For significant interactions including participant dominance, simple slopes analyses were subsequently conducted for the models with significant interactions. These interactions were decomposed consistent with Aiken and West (1991). Specifically, the interactions' simple slopes were analyzed for each experimental variable at low (-1 *SD*), mean, and high (+1 *SD*) levels of dominance across all three messages. Table 6.3 presents the results of the unstandardized coefficients and statistical significance tests for the simple slopes, and Figure 6.2 presents graphs of the interactions.

Sexual dimorphism by dominance. Two significant two-way interactions between sexual dimorphism and participant dominance were found for attitude (η^2 = .02) and message realism (η^2 = .01; see Table 6.2). First, people with low dominance were slightly better persuaded by feminine sources compared to masculine sources (B_{M2} = -0.39, p = *ns*), whereas people with high dominance were better persuaded by masculine sources compared to feminine sources (B_{M2} = 0.64, see Figure 6.2c). This disordinal interaction was apparent in Messages 2 and 3 (see Table 6.3). Message 1 replicated only the effect for people with low dominance. This interaction in Message 2 was statistically significant.

Second, people with low dominance perceived more realism in target benefit messages compared to source benefit messages (B_{M3} = -0.33, $p < .05$, one-tailed), whereas people with high dominance perceived more realism in source benefit

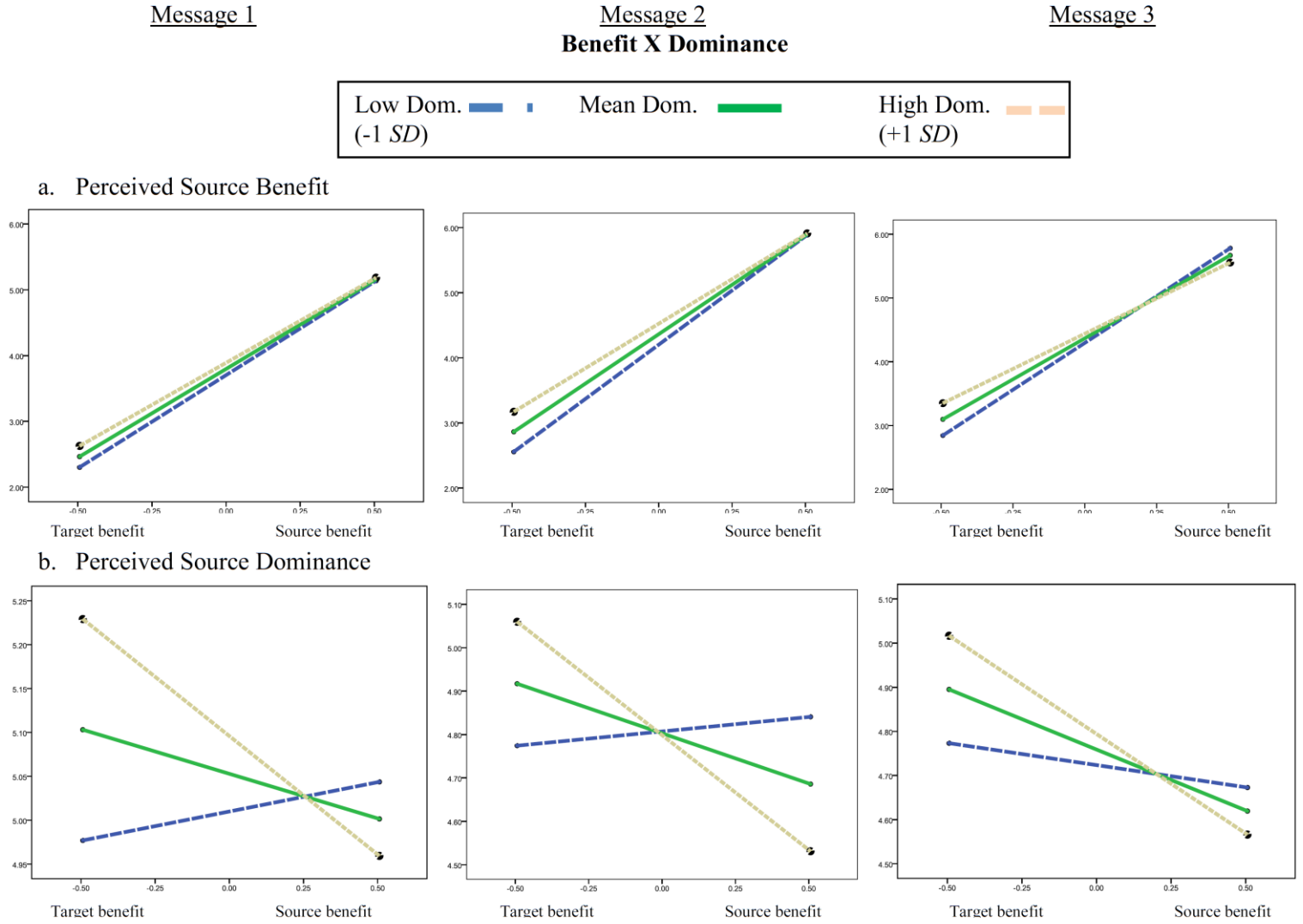
Table 6.3. *Simple Slope Conditional Effects Predicting Dependent Variables at Different Levels of Participant Dominance*

Interaction	Dependent Variable		*B* for interaction	*p* of interaction	R^2 for interaction	Low Dominance (-1 *SD*)		Mean Dominance		High Dominance (+1 *SD*)	
						B	*t*	B	*t*	B	*t*
Participant Dominance X Benefit Condition (0=Target, 1=Source)											
	Perceived source ben.										
		Message 1	-0.12	.43	.00	2.83	11.50***	2.70	15.49***	2.56	10.37***
		Message 2	-0.25	.10	.01	3.33	13.10***	3.03	16.89***	2.74	10.76***
		Message 3	-0.31	.05	.01	2.94	11.02***	2.57	13.66***	2.21	8.28***
	Source dominance										
		Message 1	-0.14	.18	.00	0.07	0.38	-0.10	-0.82	-0.27	-1.53
		Message 2	-0.25	.04	.01	0.07	0.33	-0.23	-1.62	-0.53	-2.62**
		Message 3	-.15	.20	.00	-0.10	-0.52	-0.28	-2.02*	-0.45	-2.33*
Participant Dominance X Sex. Dimorphism Condition (1 =Feminine, 2 = Masculine)											
	Attitude										
		Message 1	-0.20	.27	.00	-0.69	-2.27*	-0.45	-2.10*	-0.21	-0.70
		Message 2	-0.43	.00	.03	-0.39	-1.53	0.12	0.69	0.64	2.50**a
		Message 3	-0.14	.38	.00	-0.10	-0.38	0.07	0.36	0.23	0.88
	Message realism										
		Message 1	0.12	.29	.00	-0.20	-1.12	-0.07	-0.51	0.07	0.40
		Message 2	0.08	.54	.00	-0.21	-1.02	-0.12	-0.84	-0.03	-0.16
		Message 3	0.32	.01	.03	-0.33	-1.71*a	0.05	0.36	0.42	2.22*
Participant Dominance X Benefit X Dimorphism[b]											
	Likability										
		Message 1	0.42	.05	.01	-0.21	-0.58	.28	1.10	0.77	2.13*
		Message 2	0.59	.00	.03	-0.78	-2.24*	-0.08	-0.31	0.62	1.79*a
		Message 3	0.08	.71	.00	0.24	0.65	0.34	1.30	0.44	1.18
	Social attraction										
		Message 1	0.27	.19	.01	-0.07	-0.20	0.25	1.04	0.57	1.67*a
		Message 2	0.47	.04	.02	-0.43	-1.12	0.13	0.49	0.69	1.81*a
		Message 3	0.20	.36	.00	-0.11	-0.31	0.12	0.48	0.36	0.98
	Physical attraction										
		Message 1	0.25	.23	.01	-0.50	-1.47 (.07a)	-0.21	-0.86	0.08	0.24
		Message 2	0.26	.20	.01	-0.14	-0.41	0.17	0.71	0.48	1.41 (<.08a)
		Message 3	0.29	.11	.01	-0.56	-1.86*a	-0.22	-1.03	0.12	0.40
	Grade										
		Message 1	85.54	.98	.00	1080.27	0.22	1181.60	0.34	1282.94	0.26
		Message 2	-4378.21	.21	.01	-1007.89	-0.18	-6185.82	-1.52 (.07a)	-11363.74	-1.97*a
		Message 3	-9329.15	.01	.03	9935.61	1.74*a	-1115.67	-0.28	-12166.95	-2.12*

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "a" indicates significance at the one-tailed level.

[b] Group slopes for three-way interaction are reported within the text. Slopes reported indicate effect of Benefit by Dimorphism interaction at different levels of dominance.

Figure 6.2

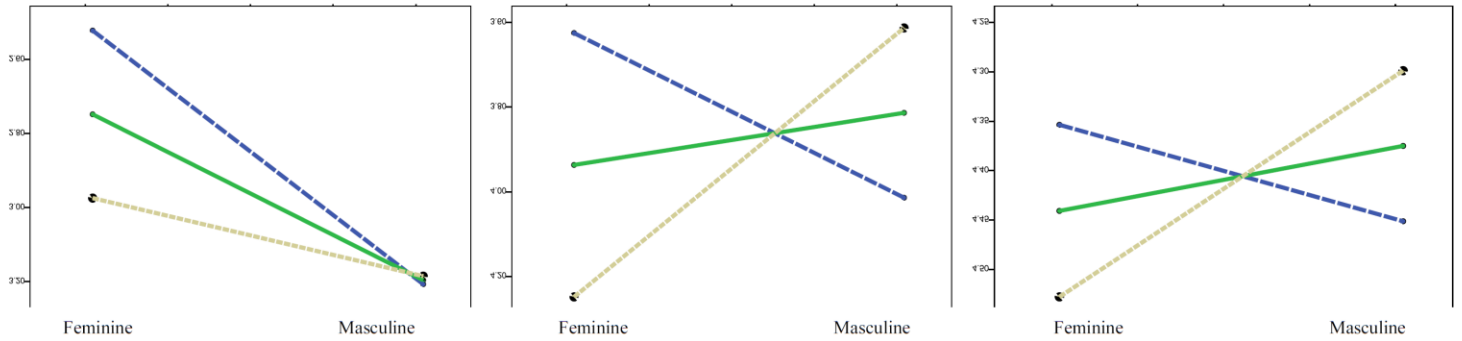

Message 1
Message 2
Message 3
Benefit X Dominance
Low Dom. (-1 SD)
Mean Dom.
High Dom. (+1 SD)
a. Perceived Source Benefit
Target benefit
Source benefit
b. Perceived Source Dominance
Target benefit
Source benefit

Message 1 Message 2 Message 3

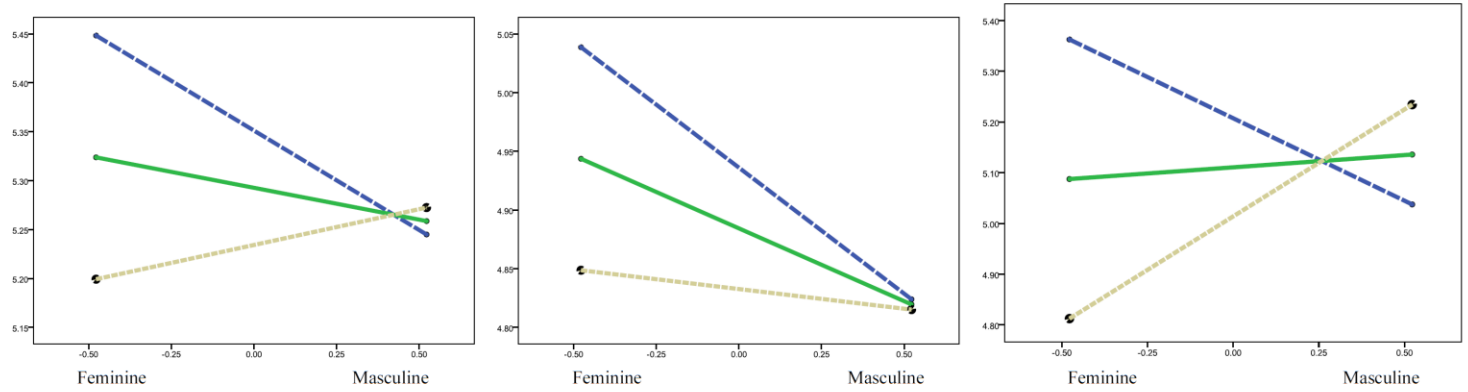
Sexual Dimorphism X Dominance

Low Dom. (-1 *SD*) Mean Dom. High Dom. (+1 *SD*)

c. Attitude, direct



d. Message realism

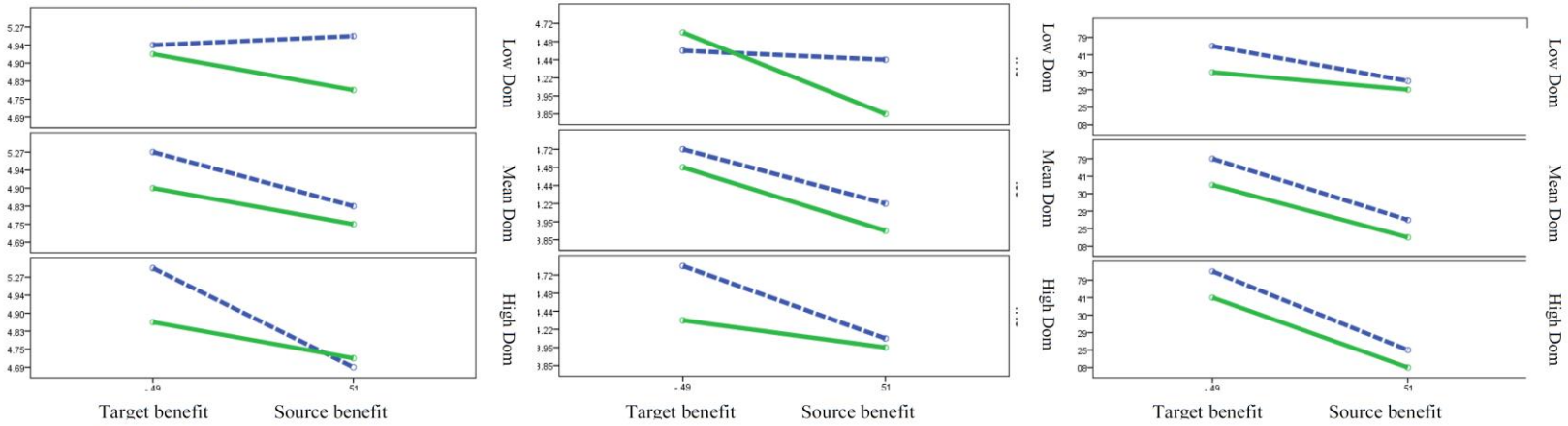


Message 1 Message 2 Message 3

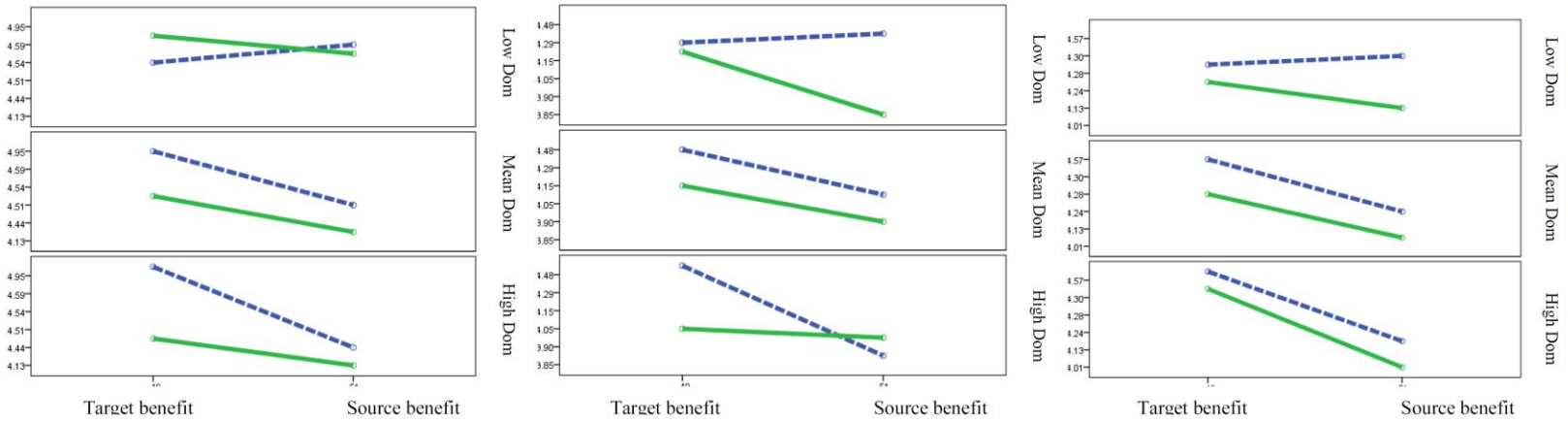
Benefit X Sexual Dimorphism X Dominance

Feminine Masculine

e. Likability



f. Social attraction



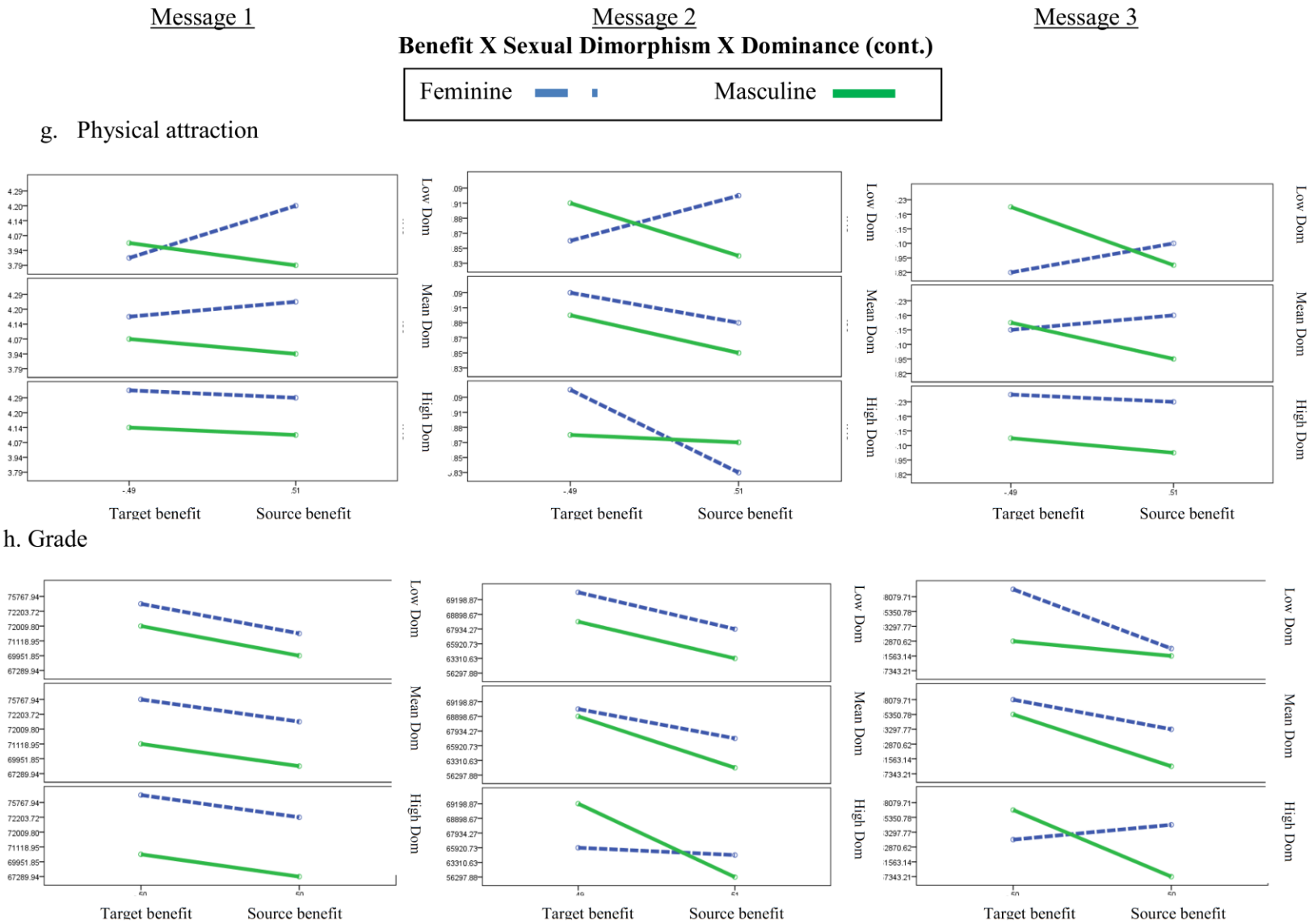


Figure 6.2. Significant repeated measures ANOVA interactions decomposed across individual messages.

messages compared to target benefit message (B_{M3} = 0.42, see Figure 6.2d). This disordinal pattern was apparent in Messages 1 and 3 (see Table 6.3). Message 2 replicated the effect only for people with low dominance. The interaction in Message 3 was statistically significant.

Benefit frame by dominance. A significant two-way interaction between benefit frame and dominance was found for perceived source benefit (η^2 = .01) and perceived source dominance (η^2 = .02). First, people with low dominance perceived the target benefit message as less beneficial to the source and the source benefit message as more beneficial to the source compared (B_{M2} = 3.33, B_{M3} = 2.94) to those higher in dominance (B_{M2} = 2.74, B_{M3} = 2.21, see Table 6.2 and Figure 6.2a). That is, those with lower dominance perceived greater differences between phenotypic cues in the messages that indicate the self-interest of the source. This effect was apparent across all three messages, and it was significantly different in the latter two (see Table 6.3). This result replicates the finding from Experiment 1.

Second, perceived dominance of the source differed as a function of participant dominance and benefit frame (see Table 6.2). As people increased in dominance, the more dominance they attributed to target benefit source and the less dominance they attributed to the source benefit sources. That is, people low in dominance perceived the source of the target benefit message as similarly dominant to the source benefit message (B_{M2} = 0.07, p = *ns*). However, people high in dominance thought the target benefit message as more dominant than the source benefit message (B_{M2} = -0.53, see Figure 6.2b). Highly dominant people viewed other-interested sources as significantly more dominant than self-interested sources,

whereas people low in dominance viewed self-interested sources as marginally more dominant than other-interested sources. This effect was apparent in all messages, but it was only significant for Message 2 (see Table 6.3).

Sexual dimorphism by benefit frame by dominance. Similar significant three-way interactions were found for likability ($\eta^2 = .02$), social attraction ($\eta^2 = .01$), physical attraction ($\eta^2 = .01$), and assigned grade ($\eta^2 = .01$) between the sexual dimorphism condition, benefit frame condition, and participant dominance (see Table 6.2). First, an effect for likability was similar in all three messages, and was statistically significant in the first two (see Table 6.3, see Figure 6.2e). People low in dominance reported similar liking for other-interested feminine sources compared to self-interested feminine sources ($B_{M1} = 0.04$, $p = ns$; $B_{M2} = -0.01$, $p = ns$), whereas people low in dominance reported greater liking for other-interested masculine sources compared to self-interested masculine sources ($B_{M1} = -0.18$, $p = ns$; $B_{M2} = -0.79$). People high in dominance reported greater liking for other-interested feminine sources compared to self-interested feminine sources ($B_{M1} = -0.91$, $B_{M2} = -0.99$), whereas people high in dominance experienced slightly less liking for other-interested masculine sources compared to self-interested masculine sources ($B_{M1} = -0.14$, $p = ns$; $B_{M2} = -0.37$, $p = .055$, one-tailed). Put another way, people low in dominance liked the selfless feminine and masculine sources equal, but liked the selfish feminine source more than the selfish masculine source. However, people high in dominance liked the selfless feminine source more than the selfless masculine source, but exhibited no difference in the liking between the selfish masculine and feminine

sources. Decreases in likability between the selfless and selfish masculine source were similar regardless of participant dominance.

Second, attraction to the source was influenced by a three-way interaction (see Table 6.2). Significant for Message 2 (see Table 6.3), but showing a similar pattern in all messages, the results indicated that people low in dominance had similar social attraction after exposure to other-interested feminine sources compared to self-interested feminine sources (B_{M2} = 0.02, p = *ns*), whereas people low in dominance had greater social attraction after exposure to other-interested masculine sources compared to self-interested masculine sources (B_{M2} = -0.41, p = .07, one-tailed). People high in dominance had more social attraction after exposure to other-interested feminine sources compared to self-interested feminine sources (B_{M2} = -0.78), whereas people high in dominance experienced similar social attraction after exposure to other-interested masculine sources compared to self-interested masculine sources (B_{M2} = -0.09, p = *ns*). For less dominant people, selfishness was less attractive, but only among masculine sources, but for more dominant people, selfishness was less attractive, but only among feminine sources. The interaction also indicates that less dominant people had greater social attraction toward the selfish feminine source than toward the selfish masculine source but exhibited no difference in social attraction between the selfless masculine and feminine sources, whereas more dominant people had greater social attraction toward the selfless feminine source than toward the selfless masculine source but exhibited no difference in social attraction between the selfish masculine and feminine sources (see Figure 6.2f).

Third, physical attraction was predicted by the interaction of source dimorphism, benefit frame, and participant dominance (see Table 6.2 and Figure 6.2). This effect was found in all three messages, which is why it exhibited significant in the repeated measures ANCOVA but was only marginally significant with a one-tailed test in Message 3 (see Table 6.3). Means of this message will be reported to demonstrate the effect. People low in dominance were less physically attracted to masculine sources who were self-interested rather than other-interested (B_{M3} = -0.29, p = .09, one-tailed), but were more physically attracted to feminine sources who were self-interested rather than other-interested (B_{M3} = 0.28, p = . 09, one-tailed). People high in dominance were generally more physically attracted to feminine sources, with little differences stemming from the beneficence of the sources (B_{M3} = -0.26 for feminine source, p = *ns;* B_{M3} = -0.14 for masculine source, p = *ns*).

Finally, assigned grade differed by participant dominance (see Table 6.2). This effect is similar in Messages 2 and 3, but it was significant only for Message 3 (see Table 6.3) and will be interpreted according to those slopes. People low in dominance assigned a higher grade to feminine target benefit sources compared to feminine self-benefit sources (B_{M3} = -11243.09), but assigned essentially the same grade to masculine sources in both benefit conditions (B_{M3} = -1307.48, p = *ns*; see Figure 6.2h). People high in dominance assigned a higher grade to masculine target benefit sources compared to feminine target benefit sources, but assigned essentially the same grade to feminine sources in both benefit conditions. Highly dominant people assigned higher grades to target benefit sources when they were masculine

(B_{M3} = -10487.74), but assigned similar grades to self- and target- benefit sources when they were feminine (B_{M3} = 1679.21, p = *ns*).

Finally, planned comparisons were conducted to test the specific hypothesized three-way interaction. Planned comparisons in repeated measures ANOVAs resulted in significant effects of the ordinal contrast predictor for a number of dependent variables (with 1 between degrees of freedom and 245 within degrees of freedom). In particular, the contrast was significant for perceived source benefit (F = 25.42, p =.000, partial η^2 = .09), perceived target benefit (F = 12.37, p =.001, partial η^2 = .05), perceived benefit to the average UMD student (F = 9.24, p =.003, partial η^2 = .04), task attraction (F = 4.62, p =.03 one-tailed, partial η^2 = .02), goodwill (F = 7.710, p =.006, partial η^2 = .03), and assigned grade (F = 7.25, p =.008, partial η^2 = .03). Among these variables, the hypothesized interaction significantly represented differences in attributions between groups after exposure to persuasive messages. Of the nineteen contrasts tested, six (32%) were significant. The planned contrast provides further support for the interaction expressed in the three hypotheses.

Model Testing

The same model was tested here as in Experiment 1, with the addition of perceived source dominance as an added intervening latent construct.

Confirmatory factor analysis. The CFAs showed acceptable multigroup model fit with constrained measurements between groups of participants who were low and high in dominance: Message 1, χ^2 (1953) = 3445.82, p < .001, RMSEA = .078, 90% CI = (.074, .083), CFI = .97, SRMR = .08; Message 2, χ^2 (1953) = 3586.42.56, p < .001, RMSEA = .082, 90% CI = (.078, .086), CFI = .95, SRMR =

.12; and Message 3, χ^2 (1953) = 3139.79, $p < .001$, RMSEA = .070, 90% CI = (.065, .074), CFI = .97, SRMR = .09.

Theoretical model testing. As detailed in Chapter 4, multigroup model testing occurred in three steps. First, the unconstrained multigroup models were run for those above and below median dominance, resulting in appropriate fit: Message 1, χ^2 (1865) = 3409.01, $p < .001$, RMSEA = .082, 90% CI = (.077, .086), CFI = .96, SRMR = .07; Message 2, χ^2 (1865) = 3838.64, $p < .001$, RMSEA = .092, 90% CI = (.088, .096), CFI = .94, SRMR = .13; and Message 3, χ^2 (1865) = 3521.07, $p < .001$, RMSEA = .085, 90% CI = (.081, .089), CFI = .96, SRMR = .10. Second, the models were then run with all structural parameters constrained to be equal for both groups, resulting in appropriate fit: Message 1, χ^2 (1912) = 3468.19, $p < .001$, RMSEA = .081, 90% CI = (.077, .085), CFI = .96, SRMR = .09; Message 2, χ^2 (1912) = 3883.62, $p < .001$, RMSEA = .091, 90% CI = (.087, .095), CFI = .94, SRMR = .13; and Message 3, χ^2 (1912) = 3565.45, $p < .001$, RMSEA = .083, 90% CI = (.079, .088), CFI = .96, SRMR = .12. Finally, modification indices were iteratively consulted and significantly different parameters between groups freed. This procedure resulted in Message 1 differences between people low and high in dominance for the path from message benefit frame to social attraction and the path from message benefit frame to similarity. The final Message 1 model reflected these freed parameters, and resulted in appropriate fit, χ^2 (1910) = 3509.96, $p < .001$, RMSEA = .083, 90% CI = (.078, .087), CFI = .96, SRMR = .09. This procedure resulted in Message 2 differences between people low and high in dominance for the path from message benefit frame to trustworthiness and the path from sexual dimorphism to

attitude. The final Message 2 model reflected these freed parameters, and resulted in appropriate fit, χ^2 (1910) = 3872.40, $p < .001$, RMSEA = .091, 90% CI = (.087, .095), CFI = .94, SRMR = .13. Message 3 did not exhibit significant differences in parameters between those low and high in dominance.

Fit statistics resulted in appropriately fitting models. The incremental fit indices of CFI demonstrated good fit (i.e., ≥ .95) for messages 1 and 3, and nearly good fit for Message 2 (Hu & Bentler, 1999). The parsimony-adjusted measures of RMSEA resulted in good (i.e., .05 - .08) to mediocre (i.e., .08 - .10) fit (MacCallum, Browne, & Sugawara, 1996). The absolute fit indices of SRMR also resulted in good fit (i.e., ≤ .09). Overall, the models fit the data acceptably well. The model fit the data less well for Message 2, but even these fit indices arguably qualify as mediocre and appropriately allow for the interpretation of the model. The standardized structural parameters are reported in Table 6.4. Significant parameters are flagged within the table, and significant differences between groups of low and high dominant individuals are indicated. In addition, graphs of the models' significant parameters are found in Figures 6.3 (for Message 1), 6.4 (for Message 2), and 6.5 (for Message 3).

The model for each message had significant effects of exogenous and intervening variables. Overall, the proportion of variance explained in attitude was .32 for Message 1, .20 for Message 2, and .65 for Message 3. Despite the significant parameters detailed below, the models provide little evidence for a consistent effect of the source's sexually dimorphic facial characteristics on attitude according to *H2*. That is, the models primarily resulted in different significant paths across message repetitions.

Table 6.4. *Experiment 2 Structural Equation Unstandardized Parameter Estimates*

		Message 1				Message 2				Message 3			
		γ Benefit	γ Dimorp	γ Int.	β	γ Benefit	γ Dimorp	γ Int.	β	γ Benefit	γ Dimorp	γ Int.	β
Likability		-0.25* [a]	-0.16	-0.08	0.25	-0.45***	-0.18	-0.39**	0.18	-0.30*	-0.18	-0.14	-0.36
	R^2	.02				.09				.03			
Social attraction		-0.00 / .47**	-0.19	-0.23	-0.07	-0.30*	-0.22	-0.25	-0.13	-0.25* [a]	-0.22	-0.22	0.19
	R^2	.02 / .07				.04				.03			
Physical attraction		.00	-0.30*	-0.25* [a]	-0.18*	-0.16	-0.13	-0.10	-0.05	-0.13	-0.02	-0.24 * [a]	-0.14
	R^2	.03				.01				.01			
Task attraction		-0.18	-0.14	-0.09	-0.13	-0.30*	0.07	-0.23* [a]	-0.05	-0.21* [a]	-0.13	-0.16	0.38 * [a]
	R^2	.02				.04				.03			
Competence		-0.26*	-0.04	-0.09	0.44	-0.39**	0.01	-0.28*	0.27	-0.25* [a]	-0.05	-0.15	-0.86* [a]
	R^2	.03				.06				.02			
Goodwill		-0.81***	0.17	-0.27	0.12	-1.57***	0.09	-1.11***	0.11	-1.05***	-0.00	-0.76 ***	-0.06
	R^2	.11				.37				.21			
Trustworthiness		-0.29*	0.02	-0.07	-0.63	-0.32*/ -0.67***	0.08	-0.48***	-0.19	-0.44***	0.05	-0.17	0.43
	R^2	.02				.08				.06			
Similarity		.19 / -0.43*	-0.23	-0.44*	0.11	-0.56***	-0.21	-0.57***	-0.04	-0.27	-0.09	-0.26	0.26*
	R^2	.04 / .06				.10				.02			
Source dominance		-0.13	-0.10	0.05	0.13	-0.18	0.11	-0.02	0.10	-0.24	0.02	-0.17	-0.31* [a]
	R^2	.00				.01				.02			
Positive affect		-0.07	-0.24	0.10	0.03	-0.15	-0.06	-0.20	-0.02	-0.07	-0.30* [a]	-0.24	0.19
	R^2	.01				.01				.02			
Message quality		-0.23	-0.24	-0.21	0.39*	-0.27* [a]	0.02	-0.28* [a]	0.31*	-0.24	-0.08	-0.33* [a]	1.25***
	R^2	.03				.03				.03			
Attitude		.03	-0.06	-0.24		-0.24	-0.35* [a]/ 0.38*	0.29		-0.04	0.21	0.28	
	R^2	.32				.20				.65			
Attitude (indirect effect)		-0.16 / -0.19	-0.09	-0.10		-0.30 / - .23	-0.03 / 0.01	-0.18		-0.22	-0.15	-0.39	

Note. γ indicates path emerging exogenous variable. β indicates path emerging from intervening variable and ending in the endogenous variable (i.e., attitude). Significant differences resulted from multigroup analyses are separated by a slash (low dominance / high dominance). Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

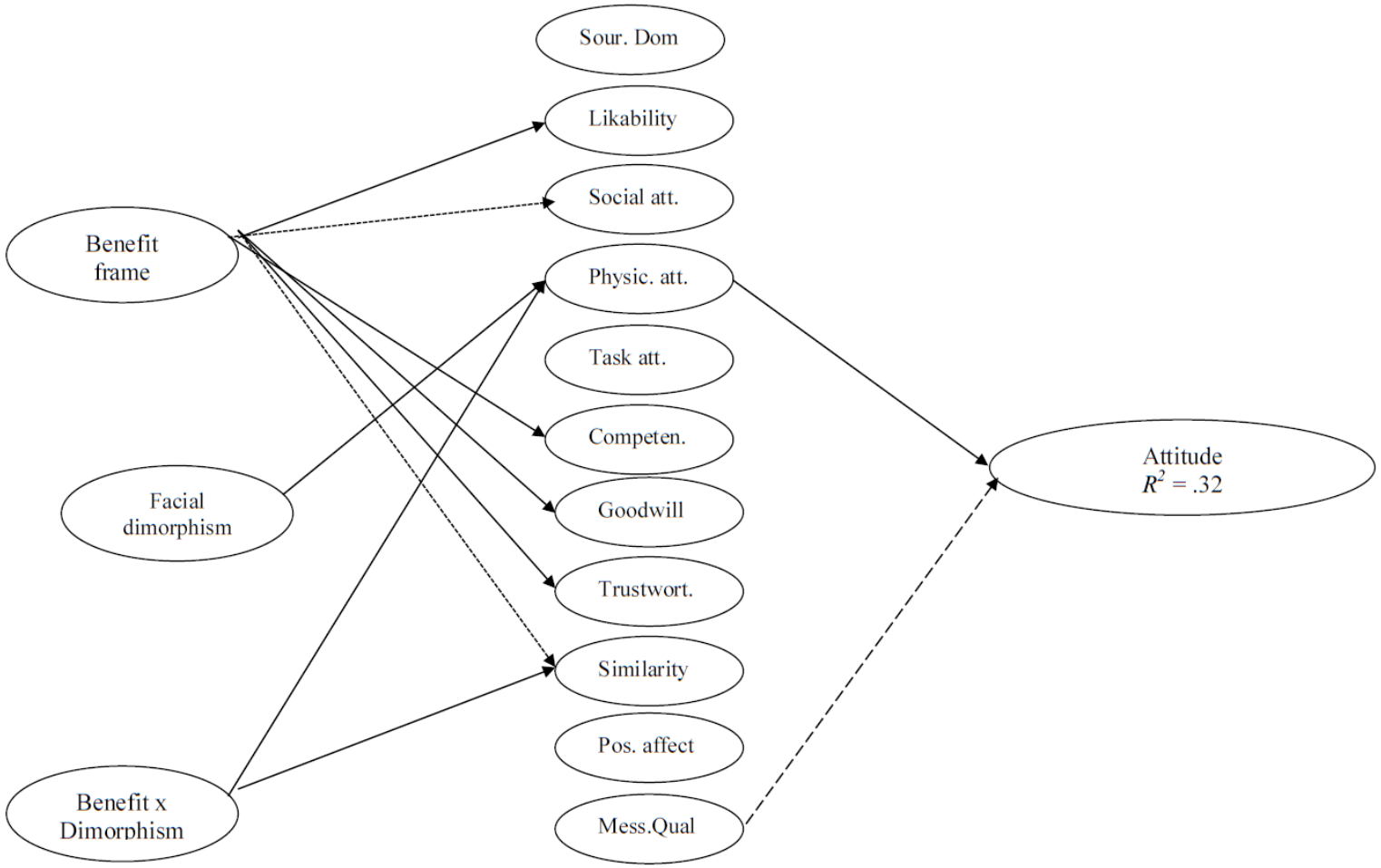


Figure 6.3. Experiment 2 structural model for Message 1.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters. Dotted lines indicate parameters that differed for participants who were high and low in dominance.

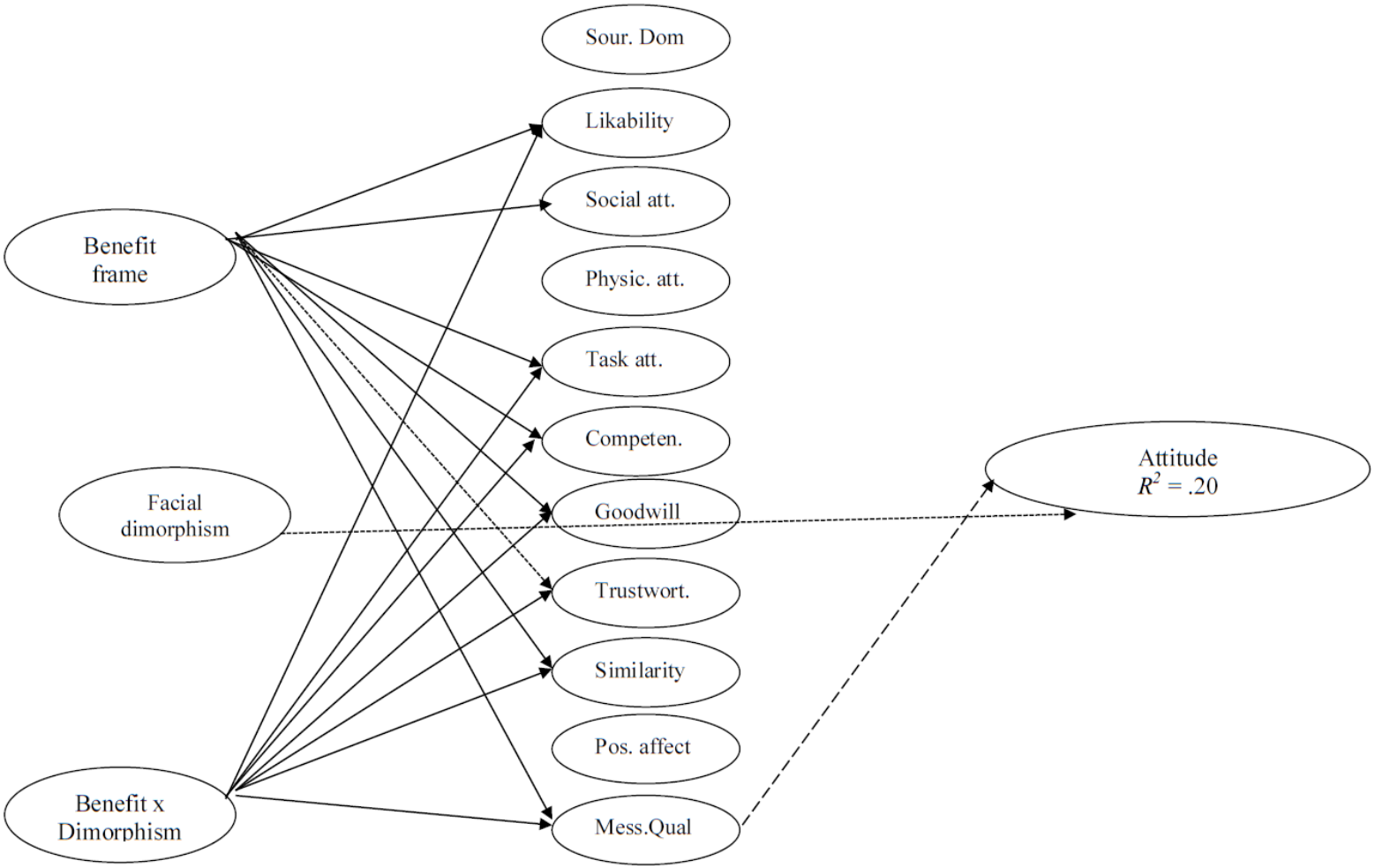


Figure 6.4. Experiment 2 structural model for Message 2.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters. Dotted lines indicate parameters that differed for participants who were high and low in dominance.

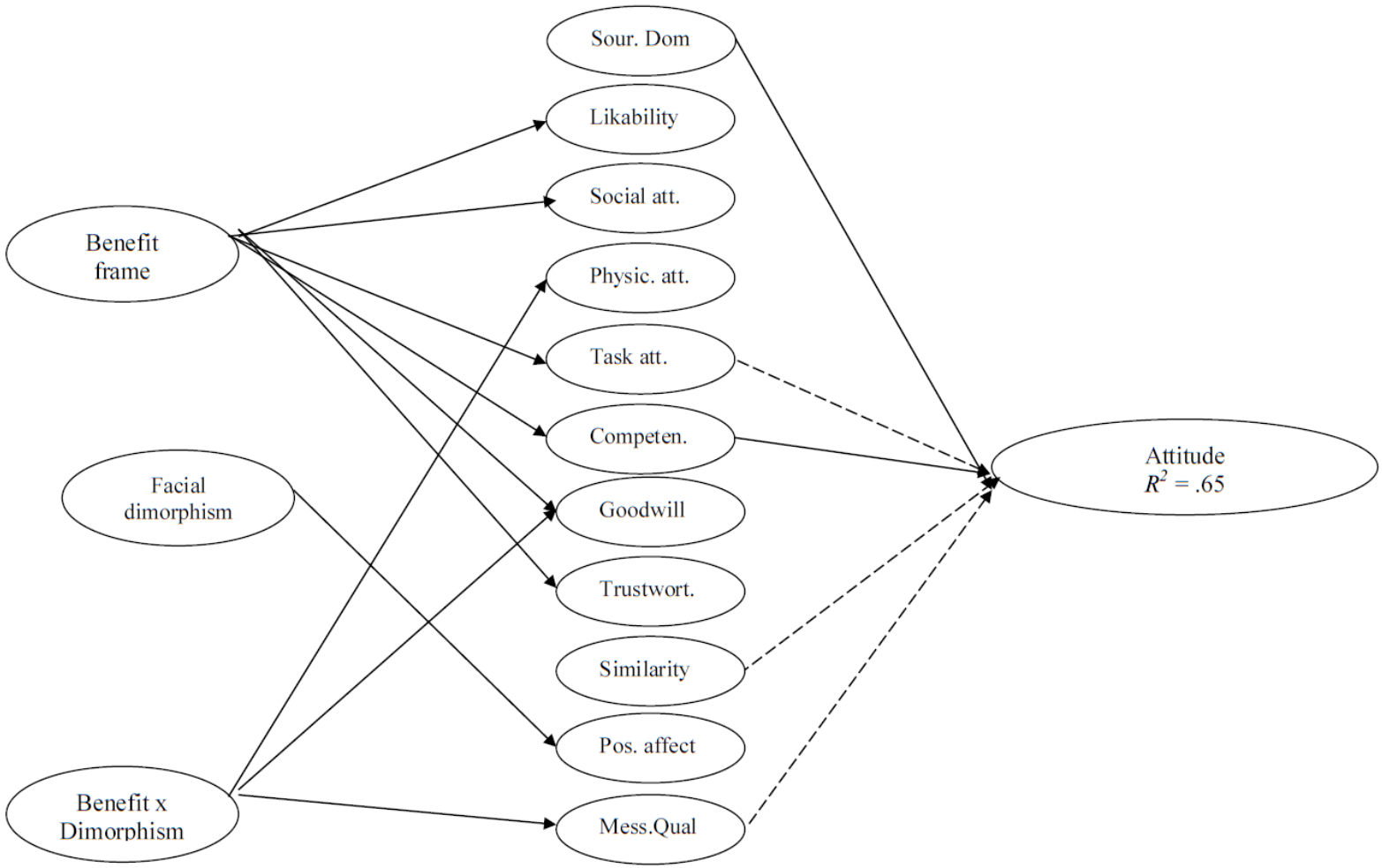


Figure 6.3. Experiment 2 structural model for Message 3.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters.

The exogenous variable of source masculinity exhibited some significant effects (i.e., significant gamma paths) across messages. For Message 1, facial sexual dimorphism significantly decreased perceptions of physical attractiveness (unstandardized $\gamma = 0.43$). Dimorphism did not have a direct or indirect effect on attitude for this message. For Message 2, facial sexual dimorphism did not significantly affect source or message attributions, but significantly and directly predicted attitude such that masculine sources, compared to feminine sources, elicited less persuasion for people low in dominance ($\gamma = -0.35$, but $p = .08$), but elicited more persuasion for people high in dominance ($\gamma = 0.38$). Dimorphism did not exhibit an indirect effect on attitude for this message. For Message 3, facial sexual dimorphism significantly decreased positive affect ($\gamma = -0.30$). Dimorphism did not exhibit a direct or indirect effect on attitude for this message. On the whole, sexual dimorphism affected attitude (Message 2), physical attraction (Message 1), and positive affect (Message 3), but these effects were inconsistent between messages.

The exogenous variable of message benefit frame had some significant effects (i.e., significant gamma paths) across messages. Source selfishness significantly decreased attributions of likability ($\gamma_{M1} = -0.25$, $\gamma_{M2} = -0.45$, $\gamma_{M3} = -0.30$), task attraction ($\gamma_{M2} = -0.30$), competence ($\gamma_{M1} = -0.26$, $\gamma_{M2} = -0.39$, $\gamma_{M3} = -0.25$), goodwill ($\gamma_{M1} = -0.81$, $\gamma_{M2} = -1.57$, $\gamma_{M3} = -1.05$), trustworthiness ($\gamma_{M1} = -0.29$, $\gamma_{M2} = -0.32$ for low dominance and -0.67 for high dominance, $\gamma_{M3} = -0.44$), similarity ($\gamma_{M1} = -0.43$ for low dominance, $\gamma_{M2} = -0.56$), and message quality ($\gamma_{M2} = -0.27$). Source selfishness decreased perceived social attractiveness in Messages 2 and 3 ($\gamma_{M2} = -0.45$, $\gamma_{M3} =$

-0.25), but operated differently for Message 1 based on participant dominance, with those high in dominance perceiving more social attraction for more selfish sources (γ_{M1} = 0.47) and those low in dominance not discriminating between selfish and selfless sources (γ_{M1} = -0.00, *p* = *ns*). Communicated selfishness decreased attributions of likability, competence, and goodwill (as in Experiment 1) similarly in all three messages.

The interaction between dimorphism and benefit frame also had some significant effects. The interaction was calculated by multiplying the dummy coded experimental variables, facial sexual dimorphism (0 = *feminine*, 1 = *masculine*) and benefit frame (0 = *target benefit*, 1 = *source benefit*). The interaction significantly affected intervening variables, including competence (γ_{M2} = -0.28), goodwill (γ_{M2} = -1.11, γ_{M3} = -0.76), trustworthiness (γ_{M2} = -0.48), and similarity (γ_{M1} = -0.44, γ_{M2} = -0.57). Attitude was not predicted by the interaction. Overall, the interaction inconsistently predicted source and message attributions as well as attitude. Also important, the interaction did not significantly differ for groups with different levels of dominance, providing no support for the hypothesized three-way interaction. These results give further reason to reject *H2*.

A few intervening variables significantly predicted attitude. Messages that were perceived higher in quality (unstandardized β_{M1} = 0.39, β_{M2} = 0.31, β_{M3} = 1.25) and sources that had higher task attraction (β_{M3} = 0.38) lead to greater attitude change. Like in Experiment 1, attitude change was actually hindered when sources were perceived as physically attractive (β_{M1} = -0.18) or competent (β_{M3} = -0.86, but *p* = .077). Sources perceived as more dominant (γ_{M3} = -0.31, but *p* = .07) also elicited

less positive attitude. Overall, significant effects of intervening variables provided little consistent evidence that attributions mediate the effect of source cue on attitude. No intervening variables that were significantly affected by facial sexual dimorphism, or dimorphism's interaction with benefit frame, significantly predicted attitude. Further, indirect effects of dimorphism on attitude were not significant for these models.

On the whole, the structural equation models were generally consistent with the conclusions made from the ANCOVA findings: Exogenous variables, both in isolation and in varying interactive combinations, had some significant effects on attitude and intervening variables, but the effects between messages showed little similarity. Further, the hypothesized three-way interaction on attitude was not significant. Taken as a whole, these results provide little clear evidence to suggest that facial sexual dimorphism affected persuasion according to the predictions.

Discussion

Overall, little consistent evidence was found to support the hypothesized evolutionary explanation for facial sexual dimorphism as a determinant of source persuasiveness. Although a number of effects were significant, many of them resulted in relationships opposite to those hypothesized. That is, more dominant people evaluated masculine sources more positively, and less dominant people evaluated feminine sources more positively. However, differential reactions to persuasive messages based on phenotypic masculinity cues, message benefit frame, and individual differences in dominance suggest that phenotypic characteristics of sources are at play in how people are persuaded.

It was expected that people low in dominance would be more persuaded by selfish masculine sources than selfless ones (*H2a*) and by selfless feminine sources than selfish ones (*H2b*), whereas people high in dominance would be less persuaded by selfish sources regardless of facial features (*H2c*). However, less dominant targets were more persuaded by feminine sources than by masculine sources regardless of message benefit frame, and this effect was reversed for more dominant participants. It is possible that less dominant targets perceive facial masculinity as a threatening cue that primes avoidance of potential future conflict. More dominant people are more persuaded by masculine sources, but less dominant people are more persuaded by feminine sources who lack the capacity to threaten message recipients.

Perhaps participants who vary in dominance make more positive attributions toward masculine or feminine sources because such sources are more indicative of messages they are likely to give themselves. Perceptions of message realism differed as a function of participant dominance and sexual dimorphic condition. People low in dominance thought messages coming from feminine sources were more realistic than those coming from masculine sources, whereas people high in dominance thought messages coming from masculine sources were more realistic than those coming from feminine sources. On the one hand, this effect may stem from participants assessing realism by imagining themselves giving the speeches and thinking it more realistic for thems to give speeches from the types of sources with whom they identify. On the other hand, perceived similarity to the source did not differ as a function of dominance and source cue, so message realism may function as a cue that matches participants to sources.

Significant three-way interactions did not support the hypotheses—indeed, the relationships were categorically opposite from those predicted—but still provide valuable feedback regarding the role of source masculinity in persuasion. For example, likability was significantly predicted by a three-way interaction, but not as expected. Simply, less dominant people did not differ in liking toward masculine sources who were selfish rather than selfless. Instead, less dominant people showed no difference in liking toward target benefited sources, but they liked feminine source benefit sources more than masculine source benefit sources. The opposite effect was found for more dominant people: They showed no difference in liking for source benefit sources, but they liked feminine target benefit sources more than masculine target benefit sources. Similar effects were found for social and physical attraction. Here, less dominant people preferred selfless masculine sources (opposite to *H2a*) and selfish feminine sources (opposite to *H2b*), but more dominant people preferred selfish masculine sources and selfless feminine sources (whereas *H2c* stated that they would be more persuaded by selfless sources regardless of facial dimorphism). These results align with those of attitude previously reported. On the one hand, perhaps less dominant individuals do not feel threatened by feminine sources but appreciate their communicated authority—a quality they themselves might not have—and therefore prefer these people. On the other hand, perhaps more dominant individuals also do not feel threatened by feminine sources, but do not admire the quality of authority that they themselves possess and therefore prefer benevolent sources. These data do not support the proposed evolutionary explanation of social influence. However, the

consistency of the effect suggest that masculinity, selfishness, and participant dominance operate in concert on persuasion-related attributions.

More dominant people also surprisingly attributed source dominance to the persuasive sources. Not surprisingly, those low in dominance thought selfish, compared to selfless, sources were more dominant. However, those high in dominance rated selfless sources (i.e., those presenting target benefit messages) as significantly more dominant than selfish sources (i.e., those presenting source benefit messages). This reaction may potentially serve an ego-defensive function (Katz, 1960), as judging a selfless source as more dominant could alleviate their own concerns about how they, as dominant individuals, presumably communicate selfishness and dominance.

Finally, this experiment replicated results from Experiment 1. A similar effect to that found in Experiment 1 was found between participant dominance and benefit frame condition on perceived source benefit. These results further support the idea that less dominant people are more sensitive to verbal cues of goodwill in messages, as they reported target benefit messages as less beneficial to the source and source benefit messages as more beneficial to the source compared to more dominant people. In addition, message quality served as a consistent predictor of attitude, although in neither study was it significantly predicted by source cues.

Although limited support was found in ANCOVAs that tested the factorial design, planned comparisons provided more support for the predicted relationships. The planned comparison used to test the specific hypothesized three-way interaction resulted in a number of significant contrasts. These results provide reason to believe

that the relationships between source dimorphism, communicated goodwill, and participant dominance functioned to affect some attributions according to predictions. Of note, with the exception of assigned grade, the variables that were significantly predicted by the contrast were not the ones that were predicted by significant three-way factorial interaction in the previously reported ANCOVAs. The planned comparison significantly predicted differences in perceived benefit as well as task attraction, goodwill, and assigned grade. These results suggest that some, but not all, cognitive appraisals were in line with the hypothesis. Conversely, affective appraisals were not predicted by the contrast, which is in line with Experiment 1's findings.

Structural equation modeling also provided little consistent evidence that facial dimorphism influenced persuasion. A significant dimorphism by participant dominance interaction directly affected attitude in Message 2, but these results did not replicate across messages. Further, this interaction did not support the predicted relationships. Instead, less dominant people were more persuaded by feminine sources regardless of communicated selfishness. No indirect effects of exogenous variables on attitude were evident.

Overall, these results clearly allow for the rejection of *H2*. Some significant evidence suggests that people low in dominance were actually better persuaded by feminine sources compared to masculine sources. Further, people low in dominance made positive attributions about feminine selfish sources and masculine selfless sources, and this effect was opposite for those high in dominance. These results are essentially opposite from those predicted. It seems that sexually dimorphic facial cues affect attributions related to persuasion but not according to the supposed

evolutionary explanation. Further, the bulk of the evidence from the structural models suggests that the effects of dimorphism on source attributions do not translate into changes in attitude.

Chapter 7: Experiment 3

The purpose of this study was to assess whether sexual dimorphism of a source's voice and the communicated benefit frame in a message affect attitude change in targets with varying degrees of dominance. It was hypothesized that a source's voice pitch interacts with benefit frame and participants' dominance. In particular, less dominant participants in the source benefit message condition, compared to the target benefit message condition, will be more persuaded by deeper voices. Less dominant participants in the target benefit message condition, compared to the source benefit message condition, will be more persuaded by higher voices. Finally, participants high in dominance will be less persuaded from source benefit messages than from target benefit messages regardless of the depth of the source's voice.

Method

Participants

Participants were 286 students, who did not participate in the previous two studies, who volunteered from a variety of communication courses in exchange for a small amount of extra credit. Fifty-seven percent were female and 43% were male. Participants were between 18 and 38 years old (M = 19.91, SD = 1.96). Participants self-reported their race as White (64%), Asian (16%) and African American (14%), with 6% in any other listed group. In a separate question, nine percent responded as being of Hispanic, Latino, or Spanish origin.

Experimental Stimuli

Three messages pairs were digitally recorded by different amateur male voice actors who majored in Communication. Actors were instructed to read the speech as if it were being presented in an undergraduate oral communication course. All actors had previously taken an undergraduate oral communication course requiring the presentation of public speeches. Actors recorded both source and target benefit versions separately, but were told to perform speeches as similarly as possible (e.g., if emphasizing "I" in the source benefit version, emphasize the analogous "you" in the target benefit version).

Each resulting pair of recordings were similar, but varied in many respects that would serve as confounds to the benefit frame manipulation (e.g., length of pauses, speed of talking, placement of vocal inflections, volume, and total speech length). To accommodate this issue, Audacity 2.0.0 digital audio editing software was used to substitute the audio clips from the source benefit version into the target benefit version. Audio selections of the speeches that differed based on experimental condition were removed from the target benefit version and replaced by the analogous audio clip from the source benefit version. If the manipulated portions of text were spoken in such ways as to run together with the surrounding text, thereby creating an artificial break before or after the audio substitution, the most proximate natural break in speech was used as the splice point between audio files. In most cases, only one or two surrounding syllables besides the experimentally manipulated words differed between versions in the final recordings. Due to differences in the number of words between the source benefit and target benefit versions, the speeches had marginally

different lengths (see Table 7.1). This procedure resulted in two levels of benefit frame (*source* vs. *target*) that were nearly identical other than the experimentally manipulated portions of speech.

After benefit frame was manipulated within the recordings, voice pitch was digitally manipulated using Praat phonetics software (Boersma & Weenink, 2013). Consistent with previous voice pitch studies (Apicella & Feinberg, 2009; Feinberg et al., 2008; Jones, Feinberg, DeBruine, Little, & Vukovic, 2008; Jones et al., 2010; Tigue et al., 2012; Vukovic et al., 2008), pitch was raised or lowered by adding or subtracting 0.05 equivalent rectangular bandwidths (ERBs) of the baseline frequency, which is the perceptual equivalent of raising or lowering the average male voice (120 Hz) by 20 Hz. This manipulation altered pitch by correcting for the difference between actual and perceived fundamental frequencies (Tigue et al., 2012; Traunmuller, 1990) without affecting length or other vocal features of the recording. Average hertz of vocal manipulations are found in Table 7.1. This procedure resulted in three levels of pitch (*low*, *original*, and *high*). For copies of these audio files, contact the author.

Table 7.1.
Mean Hertz and Total Time for Speech Recordings Utilized in Experiment 3

	Message 1		Message 2		Message 3	
Pitch Manipulation	Source-Benefit	Target-Benefit	Source-Benefit	Target-Benefit	Source-Benefit	Target-Benefit
-0.5 ERB (deep)	141.91	138.87	106.47	106.35	113.47	116.94
Original	153.3	152.75	135.42	133.99	121.57	121.48
+0.5 ERB (high)	194.12	193.11	177.84	176.46	162.72	162.97
Time (in minutes)	1:32	1:33	1:44	1:44	2:37	2:39

The six final audio recordings were then edited in Microsoft Movie Maker 2012 to create a file type that could be uploaded to the online Web hosting provider, YouTube.com, which was embedded within the online survey Web site where participants filled out the questionnaire. YouTube is a media hosting Web site with compatible linking abilities to Qualitrics survey software. Because YouTube.com requires visual, in addition to audio, information, the title of each speech (white text on black background) appeared in the frame during the entirety of the video recording. This file was then uploaded to YouTube, and a link to the clip was placed within the questionnaire for participants to watch within the survey system.

While taking the survey, participants were prompted to play the speech and listen to it in its entirety. Questions about the speech and speaker appeared on the page of the questionnaire following the one on which the YouTube frame appeared.

Unique Measures

Descriptive statistics of all measures in Experiment 3 appear in Table 7.2.

Source dominance manipulation check. Three semantic differential items assessed the perceived masculinity of the source on a seven-point scale ("The person who gave this speech seems: *weak* vs. *strong*, *unassertive* vs. *assertive*, and *not to have a commanding presence* vs. *to have a commanding presence*).

Quasi-direct attitude measure. Four items were used after each speech to assess attitude toward the policy change: In Message 1 (e.g., "If I had a meal plan, I would participate in the program offering reusable to-go containers" and "If I ate carry-out meals in dining halls, I would use the reusable to-go containers"), Message 2 (e.g., "Legacy status should not be a requirement to qualify as an Alumni

Table 7.2. *Experiment 3 Means, Standard Deviations, and Reliability Statistics*

Variable	# items	Message 1			Message 2			Message 3		
		M	SD	α	M	SD	α	M	SD	α
Participant dominance[a]	4	4.14	1.30	.88						
Perceived source benefit	3	3.78	1.68	.92	4.16	1.97	.98	4.26	1.77	.94
Perceived target benefit	3	5.10	1.14	.86	4.77	1.41	.92	5.26	1.23	.90
Perceived avg. student benefit	3	5.39	1.18	.94	5.04	1.43	.96	5.60	1.19	.95
Likability	4	5.11	1.08	.94	4.52	1.18	.95	4.74	1.16	.95
Social attraction	3	4.62	1.12	.91	4.20	1.23	.94	4.43	1.22	.94
Physical attraction	2	4.07	0.96	.91	3.91	1.02	.89	4.17	1.00	.90
Task attraction	3	4.80	1.09	.92	4.67	1.13	.95	4.71	1.10	.96
Competence	4	5.37	0.98	.89	5.29	1.03	.91	5.36	1.03	.89
Goodwill	3	5.06	1.26	.94	4.69	1.56	.96	5.20	1.28	.94
Trustworthiness	4	5.32	0.99	.90	5.20	1.12	.93	2.27	1.09	.92
Similarity	3	4.52	1.21	.94	4.30	1.44	.94	4.52	1.38	.95
Source dominance	3	4.67	1.14	.89	4.87	1.17	.90	4.86	1.15	.90
Positive affect	4	4.46	1.31	.93	4.28	1.45	.94	4.44	1.35	.94
Attitude, direct	4	5.71	1.19	.94	3.39	1.74	.97	3.32	1.87	.97
Attitude, quasi-direct	3	5.42	1.22	.88	5.19	1.53	.94	5.69	1.28	.96
Issue importance	3	4.36	1.48	.89	4.59	1.46	.94	4.90	1.36	.92
Message quality	3	4.62	1.19	.84	4.42	1.40	.89	4.80	1.26	.88
Message realism	3	5.32	1.10	.95	5.10	1.14	.94	5.19	1.19	.97
Grade[b]	1	86.34	8.18		85.07	8.82		87.18	8.07	

Note. [a] Participant dominance was assessed at a single time independent of the message repetitions, resulting in a single individual difference measurement. [b]Grade means and standard deviations reflect scores prior to transformation. Data analyses were conducted on grades after transformation consistent with Chapter 4 descriptions.

Association scholarship applicant" and "The rule that allows only legacy students to qualify for some Alumni Association scholarships should be changed"), and Message 3 (e.g., "The Health Center should offer free year-round sexually transmitted infection testing for students" and "The current policy that only offers free STI testing a few times during the semester should be extended to the entire semester").

Results

The following repeated measures ANOVAs are reported in Table 7.3.

Manipulation Checks

Vocal sexual dimorphism. The repeated measures effect of voice pitch condition entered into a model as a single independent variable was successfully manipulated within subjects, $F(2, 236) = 5.28$, $p < .01$, partial $\eta^2 = .04$, with low (*marginal M* = 4.97, *SE* = 0.10), original (*M* = 4.87, *SE* = 0.10), and high (*M* =4.54, *SE* = 0.10) voices eliciting decreasing perceptions of source dominance, as would have been expected with a successful manipulation. Thus, voice pitch was manipulated successfully.

Benefit frame. Repeated measures ANOVAs provided mixed evidence to suggest benefit frame was successfully manipulated across within-participant cells. Participants who read the source benefit message perceived significantly greater source benefit compared to those who read the target benefit frame, $F(1, 227) = 18.60$, $p < .001$, partial $\eta^2 = .08$. However, there was no main effect for benefit frame on perceived target benefit, $F(1, 227) = 0.44$, $p = ns$, or perceived benefit to the average student, $F(1, 227) = 0.01$, $p = ns$. Although there was no main effect, benefit

frame interacted with other independent variables to influence perceived target benefit, as reported below. Thus, some, but not all, evidence suggests that the manipulation was successful.

Hypothesis Testing

A three-way interaction was expected whereby (a) less dominant people would have greater attitude change—and attributions associated with attitude change—from self-interested (i.e., communicated source benefit frame) sources with deep voices compared to other-interested sources with deep voices, (b) less dominant people would have greater attitude change from other-interested sources with high voices compared to self-interested sources with high voices, and c() dominant people would be less persuaded by self-interested sources compared to other-interested sources regardless of vocal sexual dimorphism (*H3*). Before this three-way interaction is evaluated, it is necessary to mention the main effects and two-way interactions.

Main effects. Voice pitch condition independently influenced a number of dependent variables (see Table 7.3). Deeper voices elicited greater perceptions of target benefit ($\eta^2 = .03$), likability ($\eta^2 = .02$), physical attraction ($\eta^2 = .03$), goodwill ($\eta^2 = .02$), similarity ($\eta^2 = .05$), positive quasi-direct attitudes ($\eta^2 = .02$), issue importance ($\eta^2 = .07$), message quality ($\eta^2 = .05$), and assigned grade ($\eta^2 = .02$).

The messages' benefit frame condition did not significantly influence any dependent variables besides perceived source benefit ($\eta^2 = .08$). The apparent strength

Table 7.3. *Experiment 3 Repeated Measures ANOVAs Between-Subjects Effects*

	Dominance		Benefit Condition (0=target benefit, 1=source benefit)		Voice Pitch Condition (1=deep, 2=original, 3=high)		Benefit * Voice Pitch		Benefit * Dominance		Voice Pitch * Dominance		Benefit * Voice Pitch * Dominance	
Dependent Variable	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2
Perceived source ben.	1.02	.00	18.60***	.08	1.80	.02	1.44	.01	0.39	.00	2.06	.02	0.22	.01
Perceived participant ben.	0.06	.00	0.44	.00	3.08*	.03	2.66*a	.02	4.06*	.02	3.01*a	.03	2.61*a	.02
Perceived avg. student ben.	3.16*a	.01	0.01	.00	1.47	.01	1.18	.01	1.68	.01	1.21	.01	1.12	.01
Likability	0.31	.00	0.01	.00	2.63*a	.02	1.72	.02	0.21	.00	2.20	.02	1.25	.01
Social attraction	0.47	.00	0.17	.00	0.68	.01	1.74	.02	1.65	.01	0.29	.00	1.66	.01
Physical attraction	0.22	.00	0.22	.00	3.15*	.03	0.92	.01	0.57	.00	1.38	.01	1.16	.01
Task attraction	1.63	.01	0.19	.00	0.58	.01	0.83	.01	0.00	.00	0.35	.00	0.69	.01
Competence	0.16	.00	0.02	.00	0.31	.00	1.35	.01	0.02	.00	0.19	.00	1.44	.01
Goodwill	0.04	.00	1.98	.01	2.64*a	.02	2.36*a	.02	0.00	.00	2.69*a	.02	2.60*a	.02
Trustworthiness	1.37	.01	0.01	.00	1.22	.01	0.63	.01	0.50	.00	1.04	.01	0.40	.00
Similarity	0.04	.00	0.03	.00	6.41**	.05	0.51	.00	0.06	.00	4.54**a	.04	0.76	.01
Source dominance	0.96	.00	0.05	.00	1.31	.01	1.40	.01	0.11	.00	0.29	.00	1.18	.01
Positive affect	0.55	.00	0.07	.00	1.29	.01	3.21*	.03	0.28	.00	0.95	.01	3.15*	.03
Attitude, direct	4.33*	.02	0.66	.00	1.75	.02	0.18	.0	1.02	.00	0.96	.01	0.45	.00
Attitude, quasi-direct	1.54	.01	1.15	.01	2.47*a	.02	0.25	.00	1.43	.01	1.73	.02	0.38	.00
Issue importance	0.21	.00	1.01	.00	8.55***	.07	3.14*	.03	0.95	.00	8.29***	.07	2.94*a	.03
Message quality	0.34	.00	0.61	.00	5.88**	.05	2.76*a	.02	1.09	.01	4.72**a	.04	2.61*a	.02
Message realism	1.43	.01	1.99	.01	0.57	.01	3.14*	.03	1.70	.01	0.34	.00	2.29	.02
Grade (trans)	4.46*	.02	0.49	.00	2.65*a	.02	0.97	.01	0.17	.00	1.92	.02	0.67	.01

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "a" indicates significance at the one-tailed level.

of the effect of this manipulation deviated from the previously reported experiments. Unlike this study, the benefit frame condition in those studies also significantly influenced perceptions of benefit to message targets and average students.

Participant dominance served as a significant independent predictor of three dependent variables across repeated messages. In particular, as dominance increased, perceived benefit to the average student decreased ($\eta^2 = .01$). Dominance also had a negative relationship with attitude ($\eta^2 = .02$): More dominant people had less positive attitudes in line with the messages' advocated positions. Finally, more-dominant people assigned lower grades to the speeches ($\eta^2 = .02$).

Interaction effects. A number of between-subjects repeated measures interaction effects were found (see Table 7.3). In cases in which both two-way and three-way interactions among independent variables were significant, only the three-way interaction was decomposed to explain the effect. For significant interactions including participant dominance, simple slopes analyses were subsequently conducted for the models with significant interactions. These interactions were decomposed consistent with Aiken and West (1991). Specifically, the interactions' simple slopes were analyzed for each experimental variable at low (-1 *SD*), mean, and high (+1 *SD*) levels of dominance across all three messages. Table 7.4 presents the results of the unstandardized coefficients and statistical significance tests for the simple slopes, and Figure 7.1 presents graphs of the interactions.

Voice pitch by dominance. One significant two-way interaction between the voice pitch and dominance was found for perceived similarity ($\eta^2 = .03$; see Table 7.3). People with low dominance perceived themselves more similar to sources as

sources' voice pitches deepened (B_{M2} = -0.41, B_{M3} = -0.51, see Figure 7.1a). However, people with high dominance perceived themselves less similar to sources as sources' voice pitches deepened (B_{M2} = 0.03, p = *ns*; B_{M3} = 0.40). This effect was statistically significant in Messages 2 and 3 (see Table 7.4).

Voice pitch by benefit frame. One significant two-way interaction between the voice pitch and benefit frame was found for message realism (η^2 = .03; see Table 7.3 and Figure 7.1b). Overall, participants perceived messages given from deep voiced sources to be more realistic in the source benefit frame than in the target benefit frame. High voiced sources were perceived as more realistic when they were giving target benefit frames rather than source benefit frames. Perceived message realism did not appear to vary based on benefit frame condition for messages presented in original voice pitches. Effects for originally voiced sources are difficult to interpret given the variation of effects across messages. Although the interaction was significant when accounting for the three within subjects messages simultaneously, the interaction was only significant for Message 2. However, the pattern for deep and original voices was consistent across messages.

Benefit frame by dominance. No significant two-way interactions between benefit frame and dominance were found with the exception of a significant effect on perceived target benefit (see Table 7.3). Because this variable also was affected by a three-way interaction with voice pitch, the decompositions are reported below.

Benefit frame by voice pitch by dominance. A number of significant between-subjects repeated measures three-way interactions were found (see

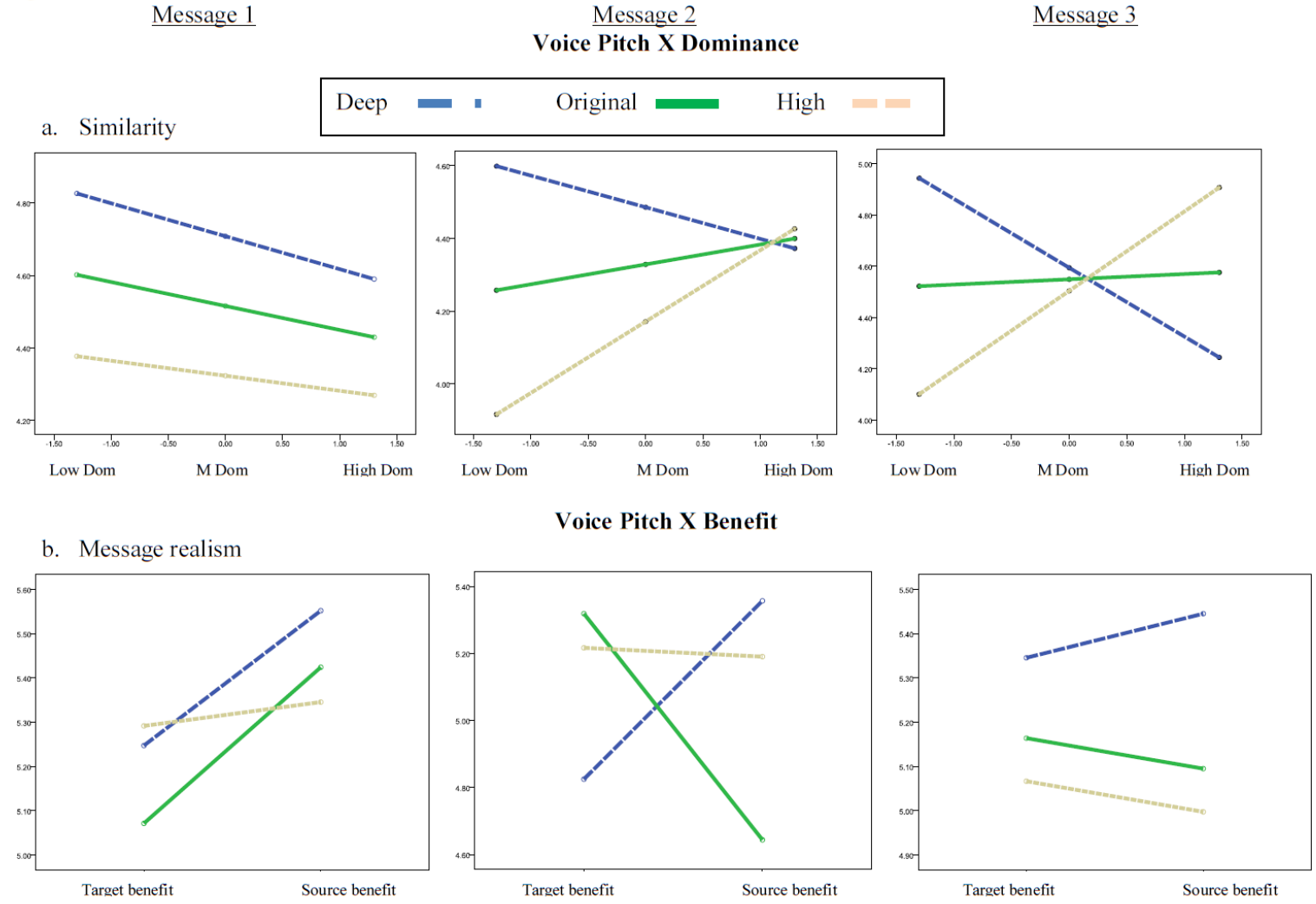
Table 7.4. *Simple Slope Conditional Effects Predicting Dependent Variables at Different Levels of Dominance*

Interaction	Dependent Variable		*B* for interaction	*p* of interaction	R^2 for interaction	Low Dominance (-1 *SD*)		Mean Dominance		High Dominance (+1 *SD*)	
Participant Dominance X Voice Pitch Condition (1=Low, 2=Original, 3=High)						B	*t*	B	*t*	B	*t*
	Similarity										
		Message 1	0.03	.69	.00	-.27	-2.06*	-0.23	-2.44 *	-0.19	-1.41
		Message 2	0.17	.047	.02	-0.41	-2.68**	-0.19	-1.71*[a]	0.03	0.20
		Message 3	0.35	.000	.07	-0.51	-3.50***	-0.05	-0.52	0.40	2.63**
Participant Dominance X Benefit X Voice Pitch[b]											
	Perceived target benefit										
		Message 1	0.15	.30	.00	-0.31	-1.24	-0.12	-0.68	0.07	0.26
		Message 2	0.11	.51	.00	-0.10	-0.36	0.03	0.17	0.17	0.57
		Message 3	0.48	.000	.04	-0.65	-2.50*	-0.02	-0.11	0.61	2.25*
	Goodwill										
		Message 1	0.09	.56	.00	-0.25	-0.92	-0.14	-0.69	-0.02	-0.07
		Message 2	0.08	.65	.00	-0.03	-0.10	0.07	0.33	0.18	0.55
		Message 3	0.61	.000	.06	-0.66	-2.50*	0.13	0.71	0.93	3.37***
	Positive Affect										
		Message 1	0.23	.16	.01	-0.33	-1.11	-0.03	-0.13	0.27	0.89
		Message 2	0.05	.79	.00	-0.37	-1.17	-0.31	-1.34	-0.25	-0.74
		Message 3	0.66	.000	.07	-0.78	-2.72**	0.08	0.37	0.94	3.12**
	Issue Importance										
		Message 1	0.17	.35	.00	-0.18	-0.57	0.03	0.15	0.25	0.75
		Message 2	0.15	.40	.00	-0.37	-1.17	-0.18	-0.78	0.02	0.05
		Message 3	0.55	.000	.05	-0.66	-2.31*	0.06	0.28	0.77	2.61**
	Message Quality										
		Message 1	0.05	.75	.00	-0.12	-0.47	-0.06	-0.33	-0.00	-0.01
		Message 2	0.06	.73	.00	-0.17	-0.56	-0.09	-0.43	-0.02	-0.05
		Message 3	0.60	.000	.06	-0.83	-3.13**	-0.05	-0.25	0.74	2.66**

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

[b] Group slopes for three-way interaction are reported within the text. Slopes reported indicate effect of Benefit by Dimorphism interaction at different levels of dominance.

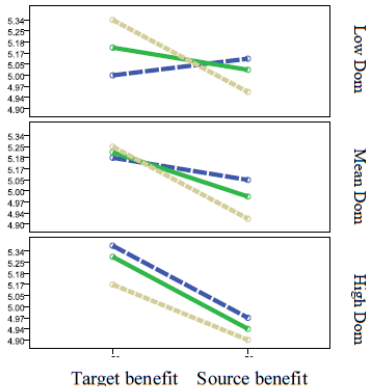
Figure 7.1

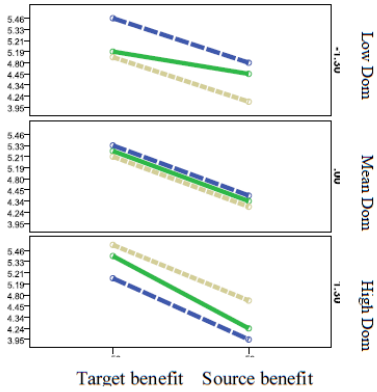

Message 1
Message 2
Message 3
Voice Pitch X Dominance
Deep
Original
High
a. Similarity
Low Dom
M Dom
High Dom
Voice Pitch X Benefit
b. Message realism
Target benefit
Source benefit

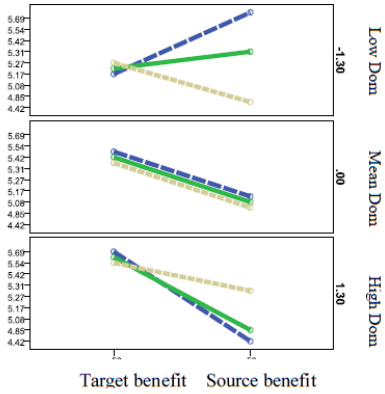
Message 1 Message 2 Message 3

Benefit X Voice Pitch X Dominance

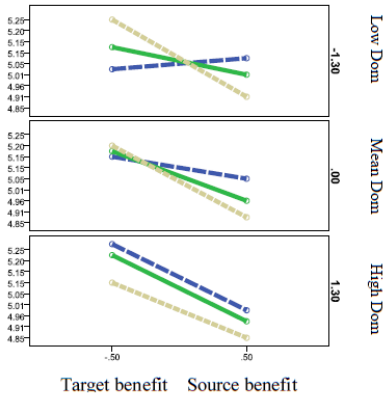
c. Perceived target benefit

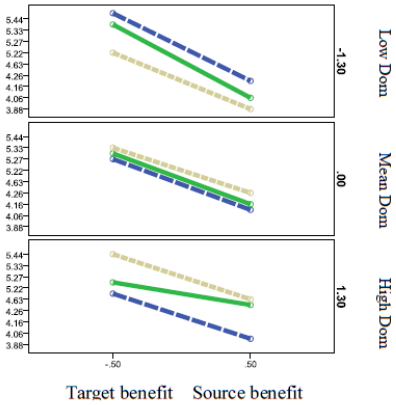


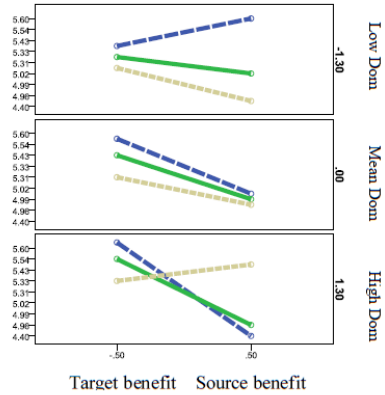




d. Goodwill



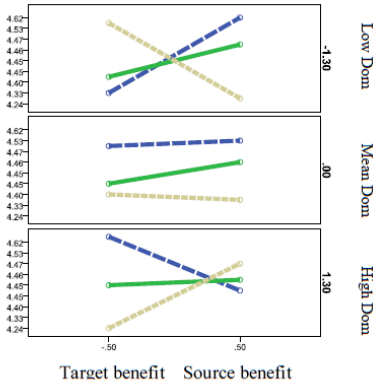


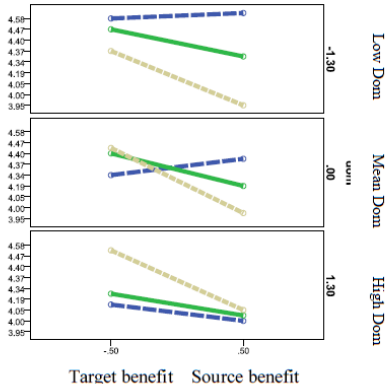


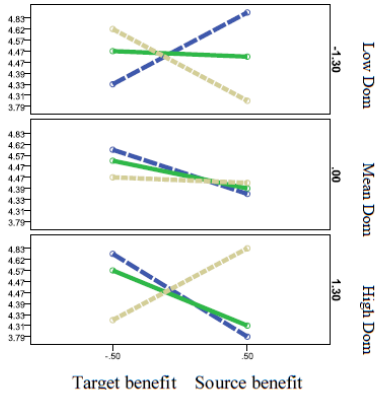
Message 1 Message 2 Message 3

Benefit X Voice Pitch X Dominance (cont.)

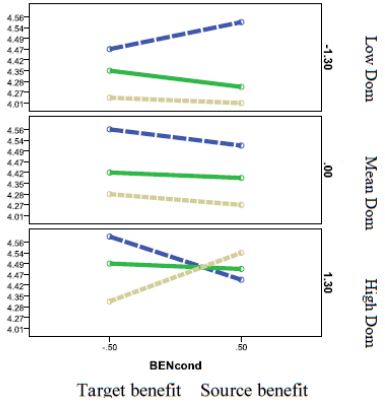
e. Positive affect

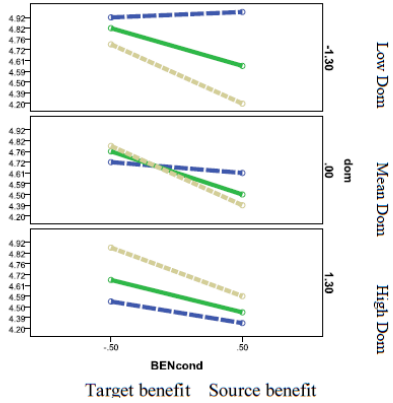


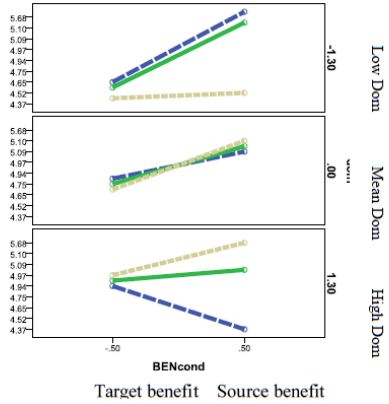




f. Issue importance







Message 1 Message 2 Message 3

Benefit X Voice Pitch X Dominance (cont.)

g. Message Quality

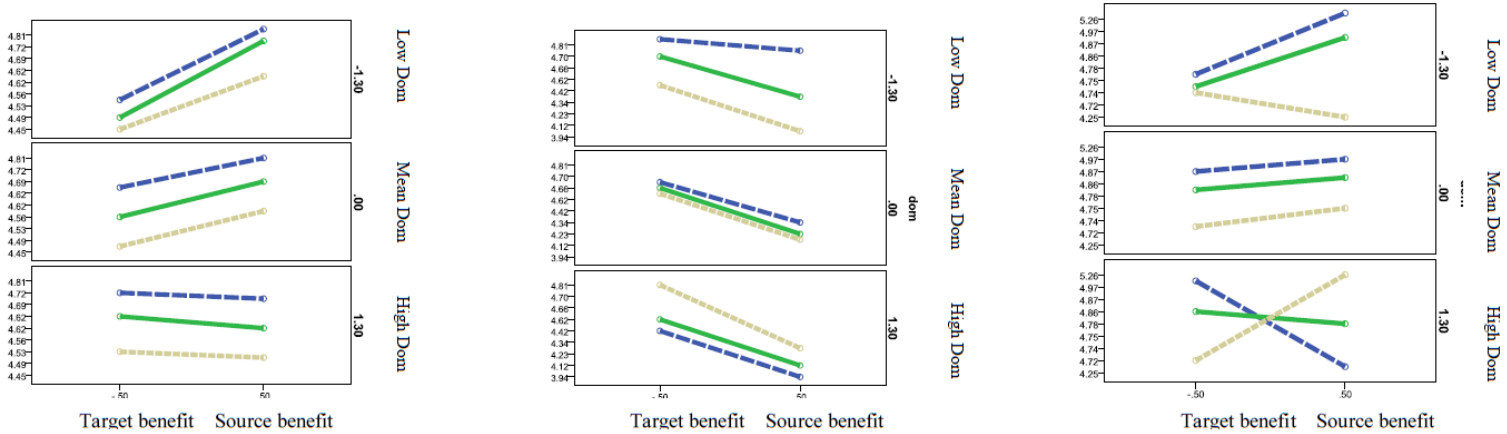


Figure 7.1. Significant repeated measures ANOVA interactions decomposed across individual messages.

Table 7.3). As seen in Table 7.4, these interactions are largely attributable to Message 3 and will be interpreted according to these slopes (although similar patterns emerged among all messages). First, perceived target benefit differed as a function of benefit frame, voice depth, and participant dominance ($\eta^2 = .02$; see Figure 7.1c). Although source benefit messages were typically viewed as less beneficial to the targets of the messages, participants with low dominance deviated from this pattern. In particular, those with low dominance perceived sources with the deepest voices as having higher target benefit when giving source benefit messages compared to target benefit messages ($B_{M3} = 0.62$), whereas those with low dominance perceived sources with the highest voices as having lower target benefit when given source benefit messages compared to target benefit messages ($B_{M3} = -0.44$). Those with high dominance perceived sources with the deepest voices as having lower target benefit when giving source benefit messages compared to target benefit messages ($B_{M3} = -1.26$), whereas those with high dominance perceived sources with the highest voices as having no significant difference in target benefit when given source benefit messages compared to target benefit messages ($B_{M3} = -0.26$, $p = ns$). This effect was present in Messages 1 and 3, and it is statistically significant for Message 3 (see Table 7.4).

Second, perceived goodwill varied as a function of the three independent variables ($\eta^2 = .02$; see Figure 7.1d). Participants low in dominance did not differ in their judgments of goodwill toward sources with deep voices for target- or source benefit messages ($B_{M3} = 0.24$, $p = ns$). However, participants low in dominance perceived source benefit messages, compared to target benefit messages, as having greater goodwill when they were given from sources with high voices ($B_{M3} = -0.84$).

Those high in dominance perceived low (B_{M3} = -1.35) and originally (B_{M3} = -0.58) voiced sources as having more goodwill in the target benefit condition than in the source benefit condition. However, those with high dominance did not differ in attributions of goodwill to sources with high pitched voices regardless of benefit frame (B_{M3} = 0.18, *p = ns*). This effect was significant for Message 3, although a similar pattern was apparent for participants low in dominance for Message 1 (see Table 7.4).

Third, positive affect differed by experimental condition and reported dominance (η^2 = .03; see Figure 7.1e). People low in dominance had greater positive affect for sources with deep voices who gave source benefit messages than for sources with deep voices who gave target benefit messages (B_{M3} = 0.64). However, this effect was reversed when sources had high voices: People low in dominance experienced greater positive affect for sources with high voices who gave target benefit messages than for sources with high voices who gave source benefit messages (B_{M3} = -0.65). Further, the opposite pattern was found for participants who were high in dominance. People high in dominance had greater positive affect for sources with deep voices who gave target benefit messages than for sources with deep voices who gave source benefit messages (B_{M3} = -1.04), whereas people high in dominance had greater positive affect for sources with high voices who gave source benefit messages than for sources with high voices who gave target benefit messages (B_{M3} = 0.51). This effect was apparent across all three messages and was statistically significant for Message 3 (see Table 7.4).

Fourth, issue importance differed by experimental condition and reported dominance ($\eta^2 = .03$; see Figure 7.1f). People low in dominance perceived the issue to be more important when source benefit, rather than target benefit, messages were given by sources with deeper voices ($B_{M3} = 1.15$), but this effect was weaker for higher voices ($B_{M3} = 0.07$). People high in dominance perceived the issue to be more important when target benefit, rather than source benefit, messages were given by sources with deeper voices ($B_{M3} = -0.57$, $p < .05$ one-tailed), but perceived the issue to be more important when source benefit, rather than target benefit, messages were given by sources with higher voices ($B_{M3} = 0.70$).

Finally, message quality differed by experimental condition and reported dominance ($\eta^2 = .02$; see Figure 7.1g). Participants low in dominance attributed greater quality to messages given from deep-voiced sources who were selfish rather than selfless ($B_{M3} = 0.88$). However, participants attributed less quality to messages given from high-voiced sources who were selfish rather than selfless ($B_{M3} = -0.50$). An opposite effect was found for people high in dominance. Those high in dominance perceived deep voiced messages as having greater quality in the target benefit condition than in the source benefit condition ($B_{M3} = -0.68$). However, those with high dominance perceived high voiced messages as having greater quality in the source benefit condition than in the target benefit condition ($B_{M3} = 0.53$). This effect was statistically significant for Message 3 (see Table 7.4, $p < .05$ one-tailed), although similar patterns were found for the other messages as well.

The significant three-way interactions on the dependent variables of perceived target benefit, goodwill, positive affect, issue importance, and message quality paint a

similar picture regarding how message recipients make attributions toward a persuasive source and message. At low dominance, people perceived high-voiced sources more positively when they communicated selflessness rather than selfishness, but perceived deep-voiced sources more positively when they communicated selfishness rather than selflessness. This effect was reversed for those high in dominance: People perceived low-voiced sources more positively when they communicated selflessness rather than selfishness, but perceived high-voiced sources more positively when they communicated selfishness rather than selflessness. These results provide support for *H3*.

Finally, planned comparisons were conducted to test the specific hypothesized three-way interaction. The contrast term only included those participants who were exposed to sources with high or low voice pitches to enhance the possible effect of the source cue manipulation. Planned comparisons in repeated measures ANOVAs resulted in significant effects of the ordinal contrast predictor for a number of dependent variables (with 1 between degrees of freedom and 160 within degrees of freedom). In particular, the contrast was significant for perceived source benefit (F = 14.75, p =.000, partial η^2 = .08), perceived target benefit (F = 10.97, p =.001, partial η^2 = .06), perceived benefit to the average UMD student (F = 13.65, p =.000, partial η^2 = .08), likability (F = 6.32, p =.013, partial η^2 = .04), social attraction (F = 4.14, p =.043, partial η^2 = .03), goodwill (F = 4.95, p =.027, partial η^2 = .03), trustworthiness (F = 3.11, p =.04 one-tailed, partial η^2 = .02), similarity (F = 2.89, p =.045 one-tailed, partial η^2 = .02), positive affect (F = 7.99, p =.005, partial η^2 = .05), direct attitude (F = 16.80, p =.000, partial η^2 = .10), quasi-direct attitude (F = 10.02, p =.002, partial η^2

= .06), issue importance (F = 7.94, p =.005, partial η^2 = .05), message quality (F = 8.63, p =.004, partial η^2 = .05), message realism (F = 8.56, p =.004, partial η^2 = .05), and assigned grade (F = 11.52, p =.001, partial η^2 = .07). Among these variables, the hypothesized interaction significantly represented differences in attributions between groups after exposure to persuasive messages. Of the nineteen contrasts tested, fifteen (79%) were significant. The planned contrast provides strong support for the interaction expressed in the three hypotheses.

Model Testing

The same model was tested here as in Experiment 1, with the addition of perceived source dominance as an added intervening latent construct.

Confirmatory factor analysis. The CFAs showed acceptable multigroup model fit with constrained measurements between groups of participants who were low and high in dominance: Message 1, $\chi^2(1953) = 3300.45$, $p < .001$, RMSEA = .076, 90% CI = (.071, .080), CFI = .97, SRMR = .10; Message 2, $\chi^2(1953) = 3239.55$, $p < .001$, RMSEA = .074, 90% CI = (.069, .078), CFI = .97, SRMR = .09; and Message 3, $\chi^2(1953) = 3264.18.85$, $p < .001$, RMSEA = .075, 90% CI = (.070, .079), CFI = .97, SRMR = .08.

Theoretical model testing. As detailed in Chapter 4, multigroup model testing occurred in three steps. First, the unconstrained multigroup models were run for those above and below median dominance, resulting in appropriate fit: Message 1, $\chi^2(1865) = 3501.69$, $p < .001$, RMSEA = .085, 90% CI = (.082, .090), CFI = .96, SRMR = .09; Message 2, $\chi^2(1865) = 3403.78$, $p < .001$, RMSEA = .083, 90% CI = (.078, .087), CFI = .97, SRMR = .08; and Message 3, $\chi^2(1865) = 3382.29$, $p < .001$,

RMSEA = .083, 90% CI = (.078, .087), CFI = .96, SRMR = .07. Second, the models were then run with all structural parameters constrained to be equal for both groups, resulting in appropriate fit: Message 1, $\chi^2(1912) = 3609.19$, $p < .001$, RMSEA = .086, 90% CI = (.082, .090), CFI = .96, SRMR = .10; Message 2, $\chi^2(1912) = 3470.49$, $p < .001$, RMSEA = .082, 90% CI = (.078, .087), CFI = .97, SRMR = .09; and Message 3, $\chi^2(1912) = 3429.84$, $p < .001$, RMSEA = .082, 90% CI = (.077, .086), CFI = .96, SRMR = .08. Finally, modification indices were iteratively consulted and significantly different parameters between groups freed. This procedure resulted in Message 3 differences between people low and high in dominance for the path from vocal sexual dimorphism to perceived similarity. The final Message 3 model reflected this freed parameter, and resulted in appropriate fit, $\chi^2(1911) = 3424.58.96$, $p < .001$, RMSEA = .082, 90% CI = (.077, .086), CFI = .96, SRMR = .08. Messages 2 and 3 did not exhibit significant differences in parameters between those low and high in dominance.

Fit statistics resulted in appropriately fitting models. The incremental fit index of CFI demonstrated good fit (i.e., ≥ .95; Hu & Bentler, 1999). The parsimony-adjusted measures of RMSEA resulted in mediocre (i.e., .08 - .10) fit (MacCallum, Browne, & Sugawara, 1996). The absolute fit indices of SRMR also resulted in good fit (i.e., ≤ .09). Overall, the models fit the data acceptably well. The standardized structural parameters are reported in Table 7.5. Significant parameters are flagged within the table, and significant differences between groups of low and high dominant individuals are indicated. In addition, grapjs of the models' significant parameters are found in Figures 7.2 (for Message 1), 7.3 (for Message 2), and 7.4 (for Message 3).

Table 7.5. *Experiment 3 Structural Equation Unstandardized Parameter Estimates*

	Message 1				Message 2				Message 3			
	γ Benefit	γ Dimorphism	γ Interaction	β	γ Benefit	γ Dimorphism	γ Interaction	β	γ Benefit	γ Dimorphism	γ Interaction	β
Likability	0.16	-0.09	0.01	0.10	-0.31*	-0.11	-0.13*	0.07	-0.31**	0.10	-0.08	0.13
R^2	.01				.04				.03			
Social attraction	0.05	-0.06	-0.03	-0.01	-0.29*	-0.09	-0.11	0.17	-0.37**	0.12	-0.06	0.03
R^2	.00				.03				.03			
Physical attraction	0.13	-0.21**	-0.06	0.04	-0.10	-0.12	-0.06	-0.31*	-0.10	-0.04	-0.07	-0.11
R^2	.04				.01				.01			
Task attraction	0.01	-0.07	-0.01	0.07	-0.20*[a]	0.02	-0.10*	-0.08	-0.22*[a]	-0.02	-0.08	-0.07
R^2	.00				.02				.02			
Competence	0.02	0.01	0.03	0.74	-0.12	-0.02	-0.06	0.05	-0.13	-0.08	-0.01	0.59
R^2	.00				.01				.01			
Goodwill	-0.09	-0.01	-0.06	0.07	-0.82***	0.20	-0.24***	0.06	-0.44**	-0.05	-0.08	-0.04
R^2	.00				.13				.04			
Trustworthiness	0.02	0.04	-0.00	0.08	-0.29**	0.06	-0.10	0.32	-0.29*	-0.01	-0.08	-0.02
R^2	.00				.04				.03			
Similarity	0.07	-0.21*	-0.03	-0.16	-0.19	-0.15	-0.10	0.04	-0.34*	-0.22*[a] / 0.13	-0.02	0.02
R^2	.02				.02				.03			
Source dominance	0.14	-0.26**	-0.02	-0.28*[a]	-0.06	-0.15*[a]	-0.09	-0.22	-0.08	-0.11	-0.03	-0.37**
R^2	.06				.02				.01			
Positive affect	-0.05	-0.07	-0.02	-0.05	-0.25*a	-0.07	-0.14*	0.03	-0.24*[a]	-0.04	-0.02	-0.08
R^2	.00				.02				.01			
Message quality	0.02	-0.10	-0.01	0.31**	-0.34*	-0.05	-0.14*	0.45***	-0.09	-0.13	-0.02	0.33**
R^2	.00				.03				.01			
Attitude	0.16	-0.11	0.00		0.10	-0.14	-0.00		0.11	-0.13	0.02	
R^2	.40				.48				.29			
Attitude (indirect effect)	-0.01	0.07	0.03		-0.32*	0.05	-0.10*		-0.07	-0.03 / -0.02	0.01	

Note. γ indicates path emerging exogenous variable. β indicates path emerging from intervening variable and ending in the endogenous variable (i.e., attitude). Significant differences resulted from multigroup analyses are separated by a slash (low dominance / high dominance). Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

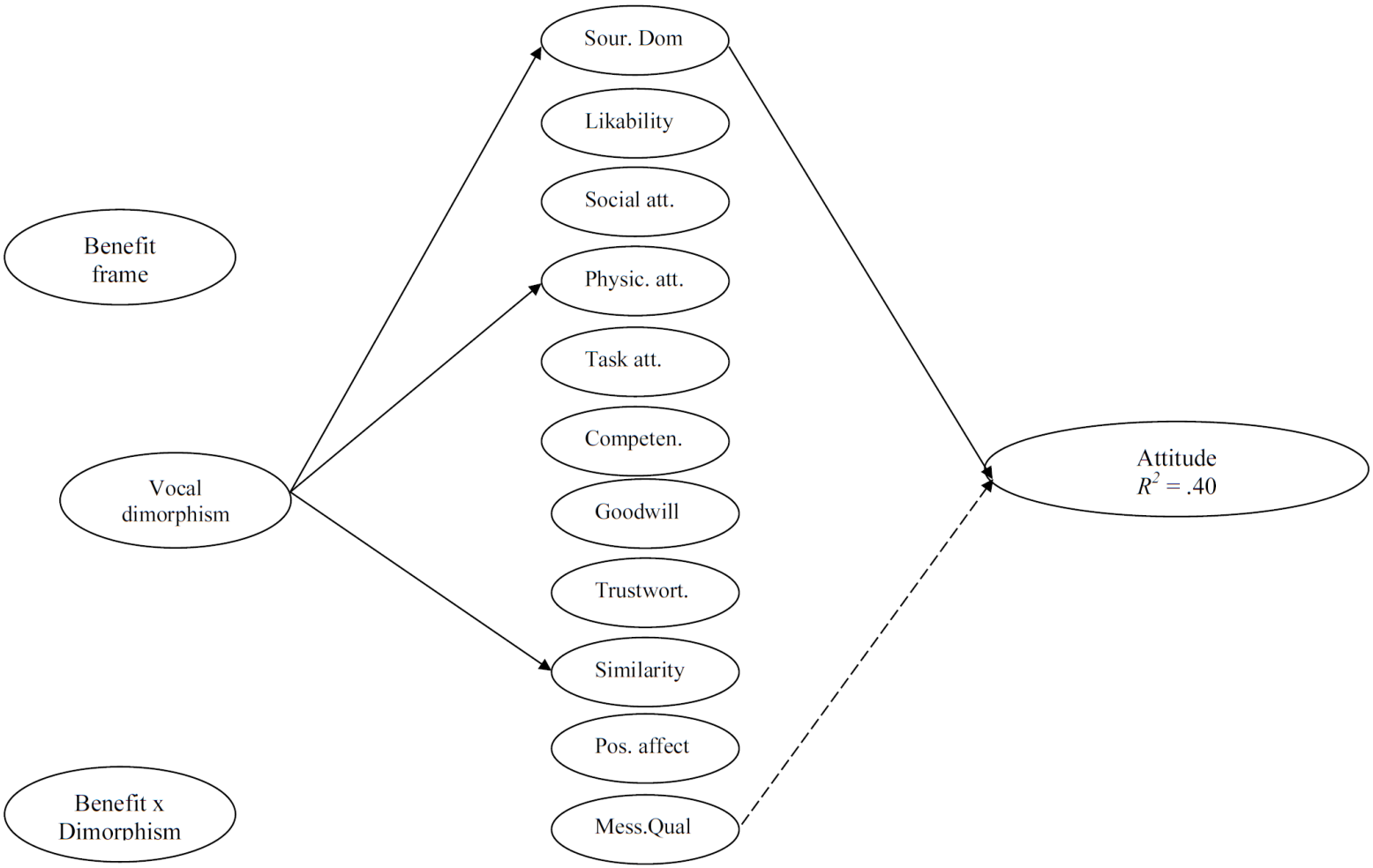


Figure 7.2. Experiment 3 structural model for Message 1.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters.

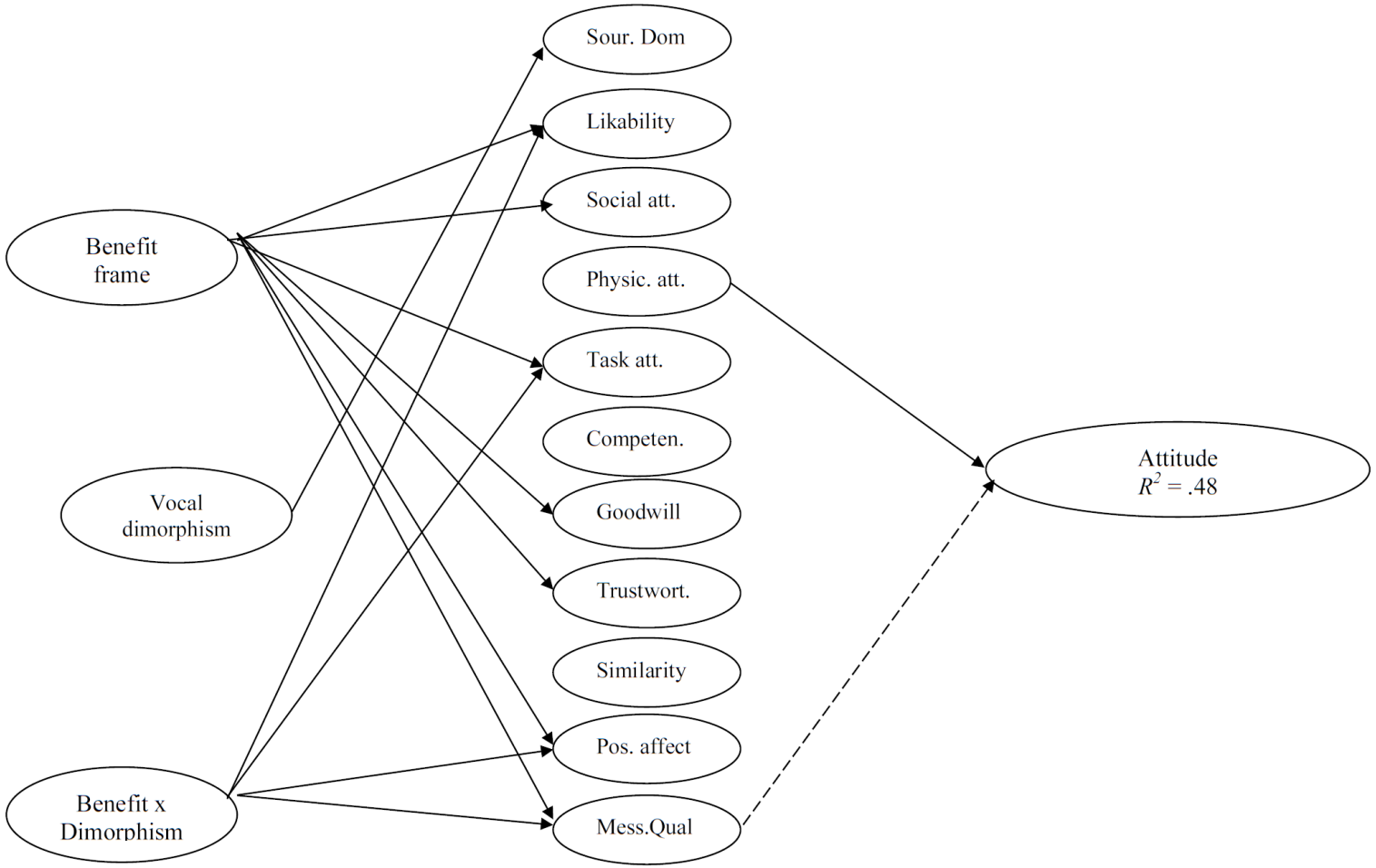


Figure 7.3. Experiment 3 structural model for Message 2.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters.

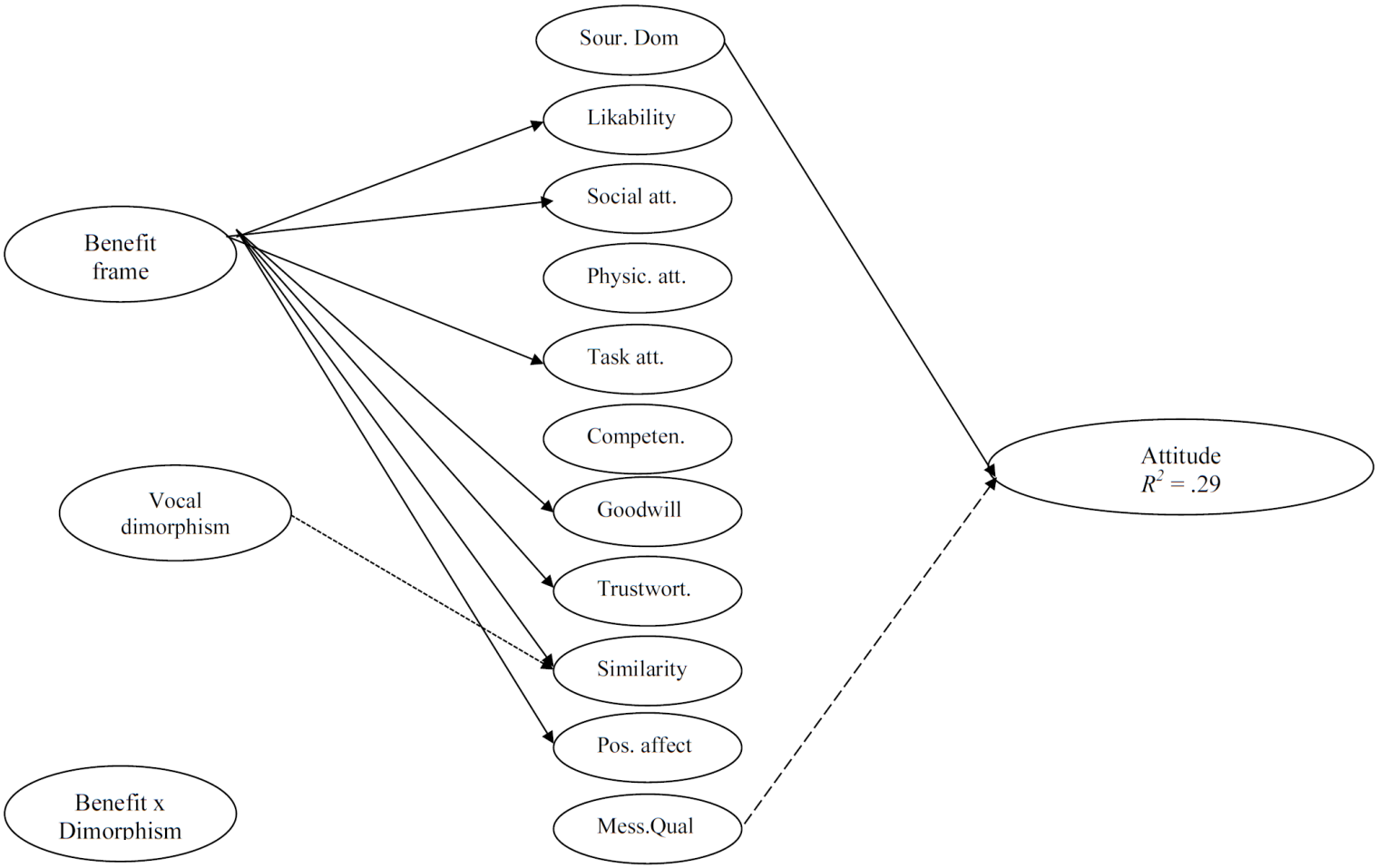


Figure 7.4. Experiment 3 structural model for Message 3.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters. Dotted lines indicate parameters that differed for participants who were high and low in dominance.

The model for each message had significant effects of exogenous and intervening variables on attitude. Overall, the proportion of variance explained in attitude was .40 for Message 1, .48 for Message 2, and .29 for Message 3. Despite the significant parameters detailed below, the models provided little consistent evidence for an effect of the source's sexually dimorphic vocal characteristics on attitude according to the three-way interaction predicted in *H3*. Not only did the models result in different significant paths across message repetitions, but the interaction did not differ based on participant dominance.

The exogenous variable of sources' vocal pitch had some significant effects (i.e., significant paths) across messages. For Message 1, increasing voice pitch significantly decreased perceptions of similarity (unstandardized $\gamma = -0.21$) and source dominance ($\gamma = -0.26$). Voice pitch did not have a direct or indirect effect on attitude for this message. For Message 2, increasing voice pitch significantly decreased perceptions of source dominance ($\gamma = -0.15$, $p < .05$, one-tailed). Voice pitch did not exhibit a direct or indirect effect on attitude for this message. For Message 3, increasing voice pitch significantly decreased perceptions of similarity ($\gamma = -0.22$, $p < .05$, one-tailed) for people low in dominance, but not for people high in dominance ($\gamma = 0.13$, $p = ns$). Voice pitch did not exhibit a direct or indirect effect on attitude for this message. On the whole, voice pitch affected similarity (Messages 1 and 3), and perceived source dominance (Messages 1 and 2), but these effects were inconsistent between messages. Different messages did not have similar results across models.

The exogenous variable of message benefit frame had some significant effects (i.e., significant paths) across Messages 2 and 3, but not for Message 1. Source selfishness significantly decreased attributions of likability (γ_{M2} = -0.31, γ_{M3} = -0.31), social attraction (γ_{M2} = -0.29, γ_{M3} = -0.37), task attraction (γ_{M2} = -0.20, $p < .05$, one-tailed; γ_{M3} = -0.22, $p < .05$, one-tailed), goodwill (γ_{M2} = -0.82, γ_{M3} = -0.44), trustworthiness (γ_{M2} = -0.29, γ_{M3} = -0.29), similarity (γ_{M3} = -0.34), positive affect (γ_{M2} = -0.25, $p < .05$, one-tailed; γ_{M3} = -0.24, $p < .05$, one-tailed), and message quality (γ_{M2} = -0.34). Selfishness decreased attributions of likability and goodwill (similar to Experiments 1 and 2) similarly in Messages 2 and 3.

The interaction between voice pitch and benefit frame also resulted in some significant effects for Message 2. The interaction was calculated by multiplying the coded experimental variables, vocal pitch (1 = *deep*, 2 = *original*, 3 = *high*) and benefit frame (0 = *target benefit*, 1 = *source benefit*). The interaction significantly affected intervening variables , including goodwill (γ_{M2} = -0.24), trustworthiness (γ_{M2} = -0.10), and message quality (γ_{M2} = -0.14). Attitude was not directly affected by the interaction, but it was indirectly affected, with an unstandardized coefficient of -.10. Overall, the interaction inconsistently predicted source and message attributions as well as attitude. Only in Message 2 did an intervening variable significantly caused by the interaction (i.e., message quality) subsequently predict attitude. Also important, the interaction did not significantly differ for groups with different levels of dominance, providing no support for the hypothesized three-way interaction. These results give reason to reject *H3*.

A few intervening variables significantly predicted attitude. As in Experiments 2 and 3, messages that were perceived higher in quality (unstandardized $\beta_{M1} = 0.31$, $\beta_{M2} = 0.45$, $\beta_{M3} = 0.33$) led to more attitude change. Also similar to some messages in the previous studies, attitude change was actually hindered when sources were perceived as physically attractive ($\beta_{M1} = -0.31$). Similar to Experiment 2, sources perceived as more dominant ($\gamma_{M1} = -0.28$, $\gamma_{M3} = -0.37$) also associated with less attitude change. Overall, significant effects of intervening variables provided little consistent evidence that attributions mediate the effect of source cue on attitude. With the exception of the interaction found in Message 2, no intervening variables that were significantly affected by vocal pitch, or pitch's interaction with benefit frame, also significantly predicted attitude. Further, indirect effects of dimorphism on attitude were not significant for the models, although the interaction in Message 2 had a small indirect effect.

On the whole, the structural equation models do not provide a great deal of evidence to support an effect of voice pitch on attitude. Voice pitch neither directly nor indirectly predicted attitude in any message. The interaction between voice pitch and benefit-frame indirectly predicted attitude for Message 2, but this effect did not replicate in the other messages. Further, no three-way interactions were significant, as dominance made no real difference in the function of the exogenous interaction parameters.

One puzzling interpretive issue is the apparent difference between the ANCOVA and SEM results in regard to Message 3. Whereas the ANOCVAs resulted in significant three-way interactions for some source and message attributions, the

SEM did not. Key differences between these tests could account for the contrasting findings. Perhaps the median split in dominance used in the structural models resulted in substantively different interaction terms than those that treated dominance as continuous. The SEM also analyzed the effect of the exogenous variables on the multiple intervening variables simultaneously, whereas the ANCOVAs assessed them separately. The SEM did not control for a main effect for participant dominance, unlike the ANCOVAs. Finally, SEM procedures allowed for the controlling of measurement error by testing relationships among latent factors, unlike the ANCOVA tests on composite variables. These differences could account for the contrast between Message 3 results obtained via different statistical analyses.

In the end, exogenous variables, both in isolation and in varying interactive combinations, had some significant effects on attitude and on the intervening variables, but the effects between messages had little consistency. Taken together, these results provide little evidence to suggest that vocal sexual dimorphism affected persuasion according to the predictions generated by an evolutionary explanation.

Discussion

A number of significant results support an evolutionary explanation for the effect of voice pitch on source persuasiveness. However, many variables were not predicted by the experimental variables or their interaction with participant dominance. Of the significant findings, perhaps most notable are the three-way interactions that supported the hypotheses. First, consider how positive affect was disordinally affected by communicated benefit, source voice pitch, and participant dominance (see Figure 7.2c). As predicted, people low in dominance felt more

positive after hearing a deep voiced source giving a source benefit message rather than a target benefit message (*H4a*), and they felt more positive after hearing a high voiced source giving a target benefit message rather than a source benefit message (*H4b*). Further, it was predicted that those high in dominance would react more negatively to selfish sources than selfless sources (*H4c*). Indeed, people high in dominance felt more positive after a deep voiced source giving a target benefit message rather than a source benefit message. However, surprisingly, people high in dominance felt less positive after hearing a high voiced source giving a target benefit message rather than a source benefit message. Essentially, the interaction between source voice pitch and communicated benefit frame was reversed for people with high and low dominance. Similar three-way effects were also found for perceived target benefit (see Figure 7.2c), goodwill (see Figure 7.2d), issue importance (see Figure 7.2f), and message quality (see Figure 7.2g). These results partially support *H4c*, as highly dominant people reacted more positively to selfless messages for deep pitched sources, but reacted more negatively to high pitched ones.

These results support the idea that people low in dominance react to persuasive messages differently based on the phenotypic cue of voice pitch: They respond more favorably to persuasive messages given by a source who possesses a deeper voice and emphasizes his own success over theirs, but respond more favorably to persuasive messages given by a source who possesses a higher voice and emphasizes their own success over his. The results also show that people high in dominance distinguish between dimorphic vocal cues to dominance in another person, as they preferred selfish high voices to deep voices, and selfless deep voices

to high voices. Contrary to previous research (Watkins, Fraccaro, Smith, Vukovic, Feinberg, & DeBruine, 2010; Watkins, Jones, & Debruine, 2010), this study supports that idea that people high in dominance are indeed attuned to dominance cues in others, but react differently to the cues compared to those low in dominance.

The main effect for voice pitch on a number of dependent variables also supports an evolutionary explanation to interpersonal influence. Deeper voices elicited more positive attributions toward the source and message, including greater attitude change in both direct and quasi-direct measures.

In addition to the factorial ANCOVAs, planned comparisons provided strong support for the predicted relationships. The planned comparison used to test the specific hypothesized three-way interaction resulted in a majority of significant contrasts. These results provide reason to believe that the relationships between voice depth, communicated goodwill, and participant dominance functioned according to predictions. Of note, affective attributions in addition to cognitive ones were significant in Experiment 3. Unlike the first two experiments, the contrast predicted liking for the source and positive affect toward the message. Further, all significant three-way factorial interactions resulting from ANCOVAs were also found to be significant in the contrasts. These results provide further reason to support the hypothesized interaction.

The structural equation models provided similar results to those of the previous experiments. For Message 1, perceived source dominance and similarity appear as significant mediators for the effect of pitch on attitude, and pitch still had a significant direct effect on the outcome variable. One intervening variable appeared to

significantly mediate the effect of pitch on attitude in Messages 2 (i.e., source dominance) and 3 (i.e., message realism), but no other indirect or direct effects were found. These effects are unique to this study and were not found in the previous experiments.

Chapter 8: Experiment 4

The purpose of this study was to assess whether similarity of a source and the communicated benefit frame in a message affect attitude change in targets with varying degrees of dominance. It was hypothesized that a source's facial similarity to the message recipient would interact with benefit frame and participants' dominance. In particular, less dominant participants in the source benefit message condition, compared to the target benefit message condition, will be more persuaded by similar (i.e., self-morphed) faces. Less dominant participants in the target benefit message condition, compared to the source benefit message condition, will be more persuaded by dissimilar (i.e., other-morphed) faces. Finally, participants high in dominance will be less persuaded from source benefit messages than from target benefit messages regardless of the facial similarity of the source.

Method

Participants

During the first phase of data collection in which people were photographed, participants were 104 students, independent of the previous samples, who volunteered from an upper division communication course in exchange for a small amount of extra credit. Of these, 100 (96%) completed the second phase of data collection to comprise the final sample. Seventy percent were female and 30% were male. Participants were between 19 and 26 years old (M = 21.08, SD = 1.02). Participants self-reported their race as White (68%), Asian (9%) and African American (16%), and other (7%). In a separate question, six percent responded as being of Hispanic,

Latino, or Spanish origin.

Procedure and Experimental Stimuli

Participants were recruited from a large communication course at the University of Maryland. They were told that participation would include getting their photograph taken and answering questions about a speech given by an undergraduate at the university. After providing informed consent, participants had their photographs taken on a neutral background. Consistent with cover stories used in previous facial morphing studies (Faber, Duff, & Lutchyn, 2006), participants were told that their photographs were being taken for a study about online social networking, in which students from another university would view the photographs and indicate whether they thought the person in the photo used social media. Participants were told to remove eyeglasses and hats, tuck long hair behind their ears, and to make a neutral facial expression (i.e., "like a passport photo") in order to avoid giving visual cues that may affect others' judgments of them during the study. Email addresses of students were also collected in order to send the second study to them at a later date.

Participants were randomly assigned to view a self-morphed or other-morphed photograph. Only the photographs of the people in the self-morph condition were subjected to the following procedure. Photographs were digitally manipulated in three steps. First, photographs were cropped to a standard size that framed the head. All photographs shared the same dimensions, and the face was centered within the crop frame.

Second, each participant's photograph was morphed with another photograph of a face with neutral expression (i.e., the alleged source). The source photograph was selected from the Karolinska Directed Emotional Faces (KDEF) image set (Lundqvist, Flykt, & Ohman, 1998). KDEF is a set of photographs that have been reliably coded on a number of interpersonal perceptual dimensions (i.e., attractive, caring, aggressive, mean, intelligent, confident, emotionally stable, trustworthy, responsible, sociable, weird, unhappy, dominant, and threatening). The photograph selected (i.e., KDEF image AM61) was chosen because of its perceived average characteristics: The face's ratings were within one standard deviation of the mean across all dimensions.

Psychomorph software (Tiddeman, Perrett, & Burt, 2001) was used to manipulate participants' faces by merging their photographs with a photograph of the source's face. The software creates composite photographs from two or more faces by merging shape and color information of each face. Each face's features were mapped using 179 facial landmarks (see Figure 8.1). The interpupilary distance of each face was standardized. The facial mask function was used to manipulate the facial information while retaining similar hair and head shape characteristics of the original source. A shape and color morph was then created by merging 30% of the participant's face into the source's face. The 70:30 other-to-self morph is below the threshold of recognition commonly used in morphing studies (Bailenson, Iyengar, Yee, & Collins, 2008; Debruine, 2002; Krupp, DeBruine, & Barclay, 2008). That is, self-morph proportions less than 40% self are unrecognizable to people who view a self-morphed photograph.

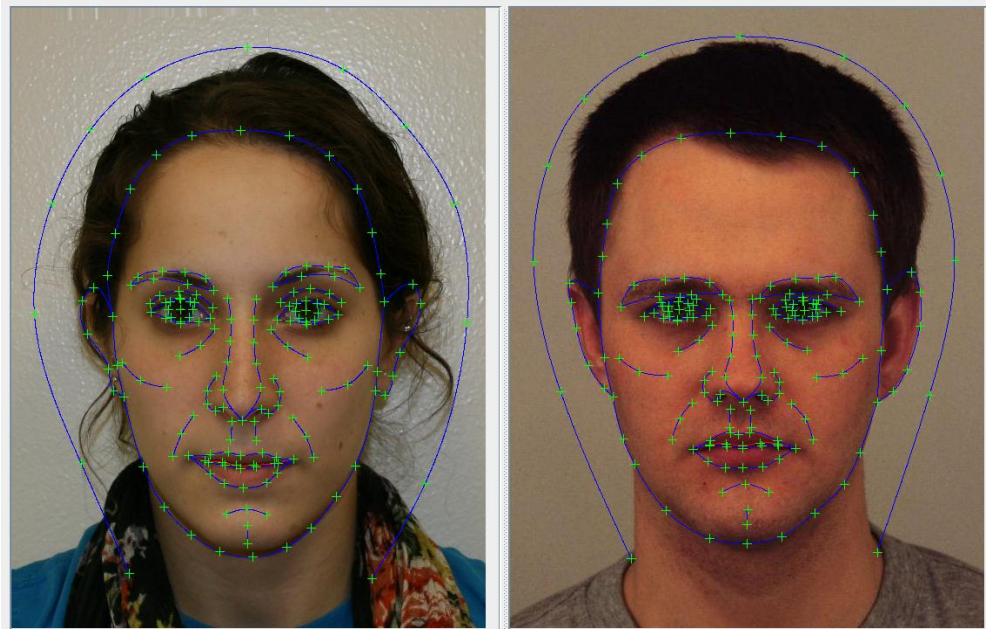


Figure 8.1. Example of facial landmarks for participant (left) and source (right) photographs.

Third, the morphed photograph was manipulated using Corel Paint Shop Pro Photo software to remove residual image ghosting, jewelry, and clothing. The image was cropped to the standard size of 230 pixels wide and 300 pixels long. These steps resulted in the final stimulus image (see Figure 8.2).

Eighteen days after participants' photographs were taken, they were emailed a link to the online survey that consistent of reading a public speech associated with the speaker's photograph. Participants in the self-morph condition were shown a photograph of their morphed face as the attributed source of the speech, whereas participants in the other-morph condition were shown a photograph of another participant's morphed face randomly selected from the pool of self-morphed faces. Participants not in the self-morph condition were shown others' morphed photos to account for a potential confound of the morphing process, as composite faces are

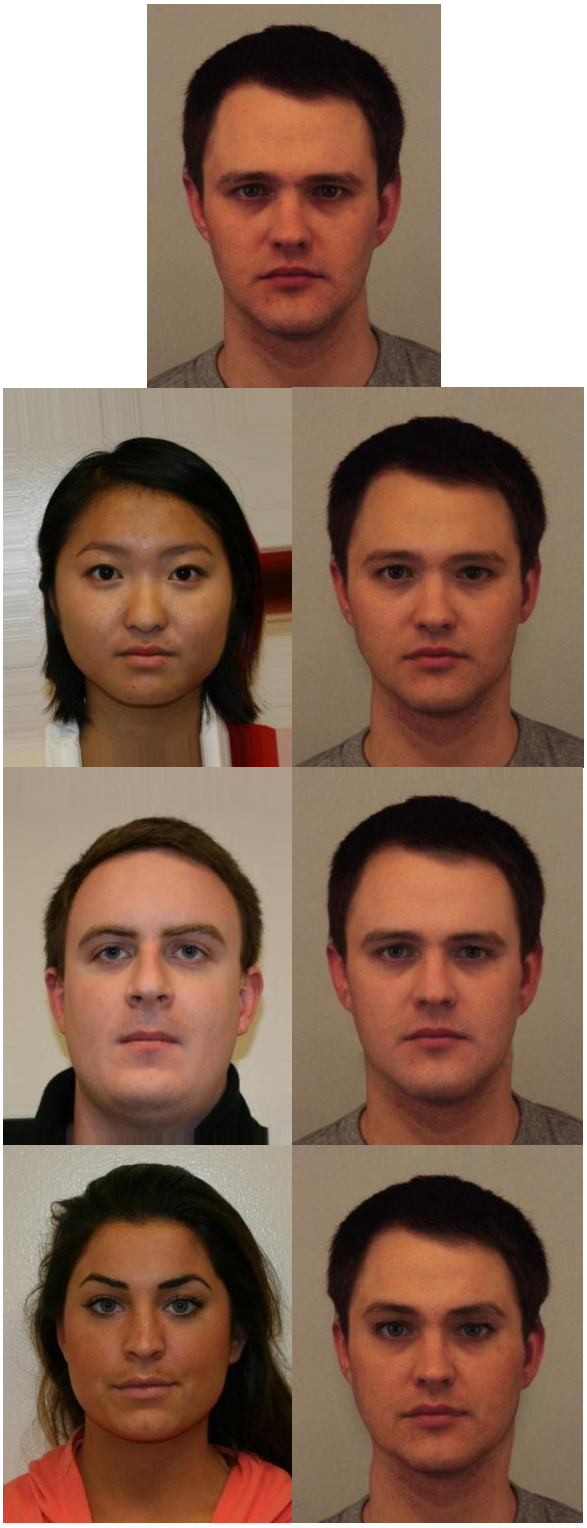


Figure 8.2. Example of original KDEF face (above center), participant (left column), and morphed (right column) faces.

perceived as more attractive than their unmorphed counterparts (Longlois & Roggman, 1990; Rhodes, 2006).

After viewing the photograph and reading the speech, participants answered the set of items used in the previous experiments.

Unique Measures

Descriptive statistics of all measures in Experiment 2 appear in Table 8.1.

Source dominance manipulation check. Three semantic differential items assessed the perceived dominance of the source of a seven-point scale ("The person who gave this speech seems: *weak* vs. *strong*, *unassertive* vs. *assertive*, and *not to have a commanding presence* vs. *to have a commanding presence*.)

Table 8.1. *Experiment 4 Means, Standard Deviations, and Reliability Statistics*

Variable	# items	M	SD	α
Dominance	4	4.10	1.26	.85
Perceived source benefit	3	4.41	1.88	.93
Perceived target benefit	3	4.92	1.30	.92
Perceived avg. student benefit	3	5.37	1.28	.95
Likability	4	4.47	1.19	.95
Social attraction	3	4.10	1.07	.87
Physical attraction	2	3.57	1.11	.87
Task attraction	3	4.24	0.97	.90
Competence	4	4.98	1.00	.87
Goodwill	3	4.63	1.43	.93
Trustworthiness	4	4.92	0.87	.86
Similarity	3	4.28	1.24	.92
Positive affect	4	1.20	1.39	.94
Attitude, direct	4	1.90	1.11	.94
Attitude, quasi-direct	3	6.08	1.16	.89
Issue importance	3	5.22	1.56	.91
Message quality	3	4.80	1.42	.92
Message realism	3	5.31	1.25	.93
Grade	1	82.76	9.46	

Quasi-direct attitude measure. Four items were used after each speech to assess attitude toward the policy change: In Message 1 (e.g., "If I had a meal plan, I would participate in the program offering reusable to-go containers" and "If I ate carry-out meals in dining halls, I would use the reusable to-go containers"), Message 2 (e.g., "Legacy status should not be a requirement to qualify as an Alumni Association scholarship applicant" and "The rule that allows only legacy students to qualify for some Alumni Association scholarships should be changed"), and Message 3 (e.g., "The Health Center should offer free year-round STI testing for students" and "The current policy that only offers free STI testing a few times during the semester should be extended to the entire semester").

Results

The following repeated measures ANOVAs are reported in Table 8.2.

Manipulation Checks

Facial similarity. The effect of the source's facial similarity on perceived similarity was not successful, but trended in the expected direction, $F(1, 92) = 2.16$, $p = .07$, one-tailed. People did not perceive themselves to be significantly more similar to self-morphed faces than to other-morphed faces. Although the main effect for similarity condition was not significant, as discussed below, the experimental variable had marginal significance when interacting with participant dominance to affect perceptions of similarity. Thus, there is some, albeit weak, evidence to suggest that similarity condition was successfully manipulated. Given that facial similarity may affect attitudes and source attributions independently of perceptions of attractiveness,

further data analysis was warranted. That is, it was possible that participants were affected by facial similarity in ways that altered the persuasiveness of the message besides through attribution of physical attractiveness.

Benefit frame. ANOVAs provided evidence to suggest benefit frame was successfully manipulated across within-participant cells. Participants who read the source benefit message perceived significantly greater source benefit compared to those who read the target benefit frame, $F(1, 92) = 28.20$, $p < .001$, partial $\eta^2 = .25$. There was no main effect for benefit frame on perceived target benefit, $F(1, 92) = 0.75$, $p = ns$. However, as reported below, benefit frame interacted with facial similarity to affect perceived target benefit. Finally, participants who read the source benefit message perceived significantly less average student benefit compared to those who read the target benefit frame, $F(1, 92) = 5.01$, $p < .05$, partial $\eta^2 = .06$. Thus, the evidence suggests that this manipulation was successful.

Hypothesis Testing

A three-way interaction was expected whereby (a) less dominant people would have more attitude change—and attributions associated with attitude change—from self-interested (i.e., communicated source benefit frame) sources with similar faces compared to other-interested sources with similar faces, (b) less dominant people would have more attitude change from other-interested sources with dissimilar faces compared to self-interested sources with dissimilar faces, and (c) dominant people would be less persuaded by self-interested sources compared to other-interested sources regardless of facial similarity (*H4).* Although no evidence was

found for a three-way interaction, it is necessary to first mention the main effects and two-way interactions.

Main effects. Facial similarity did not have significant main effects on any dependent variable.

As Table 8.2 indicates, the messages' benefit frame significantly influenced perceived benefit to the message's source ($\eta^2 = .25$), perceived benefit to the average student ($\eta^2 = .06$), and goodwill ($\eta^2 = .06$). Sources giving source benefit messages were seen as more selfish than target benefit messages.

Dominance served as a significant predictor of perceived benefit to the source (see Table 8.2). That is, as participants' dominance increased, so did the perceived benefit to the message's source ($\eta^2 = .04$).

Interaction effects. Several interaction effects were found (see Table 8.2). For significant interactions including participant dominance, simple slopes analyses were subsequently conducted for the models with significant interactions. These interactions were decomposed consistent with Aiken and West (1991). Specifically, the interactions' simple slopes were analyzed for each experimental variable at low (-1 *SD*), mean, and high (+1 *SD*) levels of dominance. Tables 8.3 and 8.4 presents the results of the unstandardized coefficients and statistical significance for the simple slopes, and Figure 8.3 presents graphs of the interactions.

Similarity by dominance. One marginally significant ($p = .055$, one-tailed) two-way interaction between the facial similarity and dominance was found for perceived similarity ($\eta^2 = .04$; see Table 8.2). For people who were exposed to other-morphed sources, dominance had a positive relationship with perceived

Table 8.2. *Experiment 4 ANOVAs Between-Subjects Effects*

	Participant Dominance		Benefit Condition (0=target benefit, 1=source benefit)		Similarity Condition (1=self-morph, 2=other-morph)		Benefit * Similarity		Benefit * Dominance		Similarity * Dominance		Benefit * Similarity * Dominance	
Dependent Variable	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2	F	η^2
Perceived source ben.	3.32*a	.04	28.20***	.25	0.53	.01	3.09*a	.04	5.92**a	.07	0.01	.00	1.82	.02
Perceived participant ben.	0.64	.01	0.75	.01	0.35	.00	4.65*	.05	0.04	.00	0.91	.01	2.74	.03
Perceived avg. student ben.	0.09	.00	5.01*	.06	0.04	.00	0.31	.00	1.51	.02	0.00	.00	0.01	.00
Likability	1.35	.02	2.12	.02	1.14	.01	0.19	.00	0.89	.01	0.10	.00	1.61	.02
Social attraction	1.69	.02	0.65	.01	0.14	.00	0.06	.00	0.21	.00	0.01	.00	0.34	.00
Physical attraction	1.19	.01	0.00	.00	0.10	.00	1.54	.02	0.28	.00	0.32	.00	1.67	.02
Task attraction	0.12	.00	0.78	.00	0.78	.00	0.73	.00	0.71	.00	0.56	.00	0.47	.01
Competence	0.01	.00	0.07	.00	0.17	.00	0.03	.00	0.00	.00	0.32	.00	0.51	.01
Goodwill	1.54	.02	5.32*	.06	0.37	.00	1.82	.02	0.84	.01	1.55	.02	0.78	.01
Trustworthiness	1.41	.02	0.02	.00	0.01	.00	0.65	.01	0.19	.00	0.00	.00	0.08	.00
Similarity	0.24	.00	1.42	.02	2.16	.03	0.50	.01	0.65	.01	3.32*a	.04	1.81	.02
Positive affect	1.78	.02	0.21	.00	0.91	.01	0.00	.00	0.02	.00	0.78	.01	0.75	.01
Attitude, direct	0.06	.00	0.92	.01	1.40	.02	0.28	.00	2.02	.02	0.74	.01	1.82	.02
Attitude, quasi-direct	0.42	.01	0.73	.01	2.12	.02	0.79	.01	1.67	.02	1.44	.02	1.84	.02
Issue importance	1.79	.02	1.54	.02	0.95	.01	0.01	.00	2.42	.03	0.00	.00	0.35	.00
Message quality	0.47	.01	0.24	.00	0.21	.00	0.05	.00	0.87	.01	1.00	.01	0.98	.01
Message realism	0.04	.00	0.03	.00	0.20	.00	0.13	.00	0.06	.00	0.67	.01	0.02	.00
Grade (trans)	0.13	.00	0.03	.00	0.36	.00	3.19*a	.04	0.31	.00	0.29	.00	2.08	.02

Note. Tests are two-tailed unless otherwise indicated. *$p < .05$, **$p < .01$, ***$p < .001$. "[a]" indicates significance at the one-tailed level.

similarity. That is, people low in dominance thought other-morphed faces were less similar to themselves than self-morphed faces (B = -0.21; see Figure 8.3b). People high in dominance thought other-morphed faces were more similar to themselves than self-morphed faces (B = 0.62, see Table 8.3). This interaction was disordinal.

Similarity by benefit frame. Three significant two-way interactions between the facial similarity and benefit frame were found for perceived source benefit (η^2 = .04), perceived target benefit (η^2 = .05), and assigned grade (η^2 = .04; see Table 8.2). First, although there was no difference in perceived source benefit for participants in the source benefit condition (self-morph M = 5.88, other-morph M = 5.72), facial similarity affected perceptions of source benefit in the target benefit condition (see Figure 8.3c). That is, participants exposed to a self-morphed source (M = 3.31) perceived the target benefit message as having higher source benefit compared to participants exposed to an other-morphed source (M = 2.59; see Table 8.4).

Similarly, although there was no difference in perceived target benefit for participants in the source benefit condition (self-morph M = 4.47, other-morph M = 4.38), facial similarity affected perceptions of target benefit in the target benefit condition (see Figure 8.3d). That is, participants exposed to a self-morphed source (M = 5.02) perceived the target benefit message as having less target benefit compared to participants exposed to an other-morphed source (M = 5.80; see Table 8.4).

Finally, participants assigned a higher grade to an other-morphed source who gave a target benefit message (M =85.12) than to other-morphs who gave a source benefit message (M = 80.29; see Figure 8.3e). Conversely, participants assigned a similar grades to self-morphed sources who gave a source benefit message (M =

Table 8.3. *Simple Slope Conditional Effects Predicting Dependent Variables at Different Levels of Dominance*

Interaction	Dependent Variable	B for interaction	p of interaction	Low Dominance (-1 *SD*)		Mean Dominance		High Dominance (+1 *SD*)	
Benefit Condition X Participant Dominance (0 = Target, 1 = Source)				B	*t*	B	*t*	B	*t*
	Perceived source benefit	-0.48	.02	3.29	8.82***	2.68	10.18***	2.08	5.54***
Similarity Condition X Participant Dominance (1 = Self-morph, 2 = Other-morph)									
	Similarity	0.33	.11	-0.21	-0.58	0.20	0.78	0.62	1.68*a

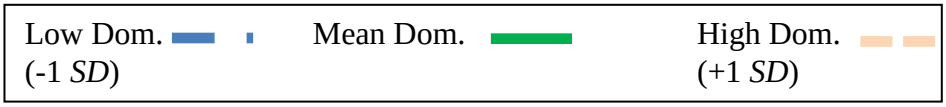
Table 8.4. *Mean Comparison of Between-Subjects Dependent Variables with Dominance as a Covariate*

Interaction	Dependent Variable	F for interaction	p of interaction	Target Ben	Target Ben	Source Ben	Source Ben
Benefit Condition X Similarity Condition				Self Morph *M (SD)*	Other Morph *M (SD)*	Self Morph *M (SD)*	Other Morph *M (SD)*
	Perceived source benefit	3.25	.075	3.31 (1.66)	2.59 (1.18)	5.88 (1.20)	5.72 (0.98)
	Similarity	3.44	.067	5.02 (1.31)	5.80 (0.87)	4.47 (1.36)	4.38 (1.21)
	Grade (trans)	3.19	.078	63856.28 (18508.29)	67960.20 (15023.63)	63713.41 (17430.09)	58840.56 (14449.43)
	Grade (untrans)[a]			82.36 (12.23)	85.12 (8.27)	82.82 (8.89)	80.29 (8.20)

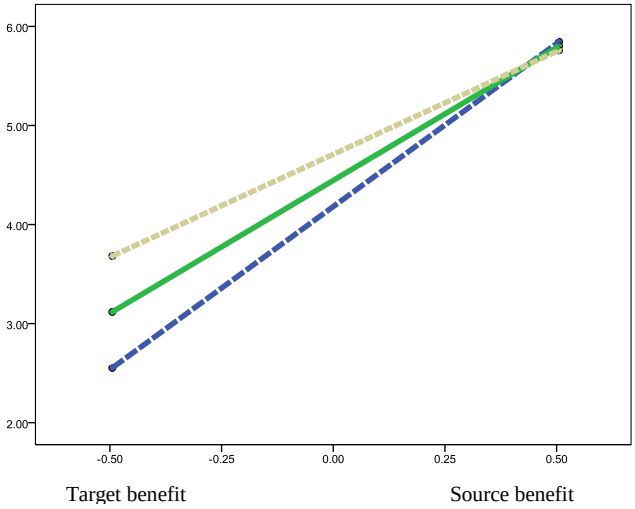
Note. [a]Means of assigned grade prior to transformation are reported for interpretation purposes.

Figure 8.3

Benefit X Dominance

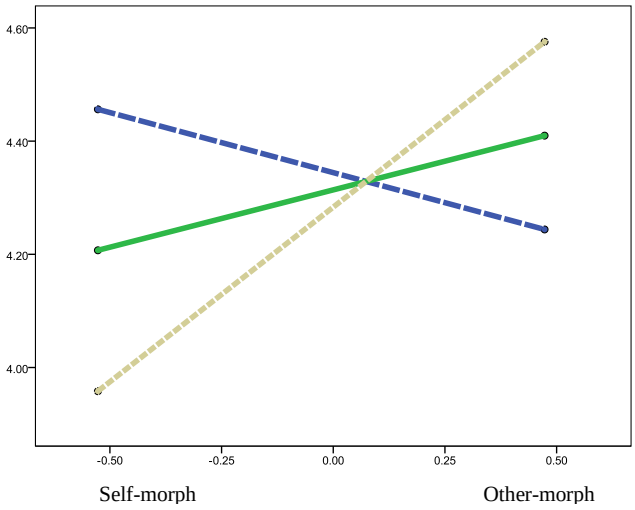


a. Perceived source benefit



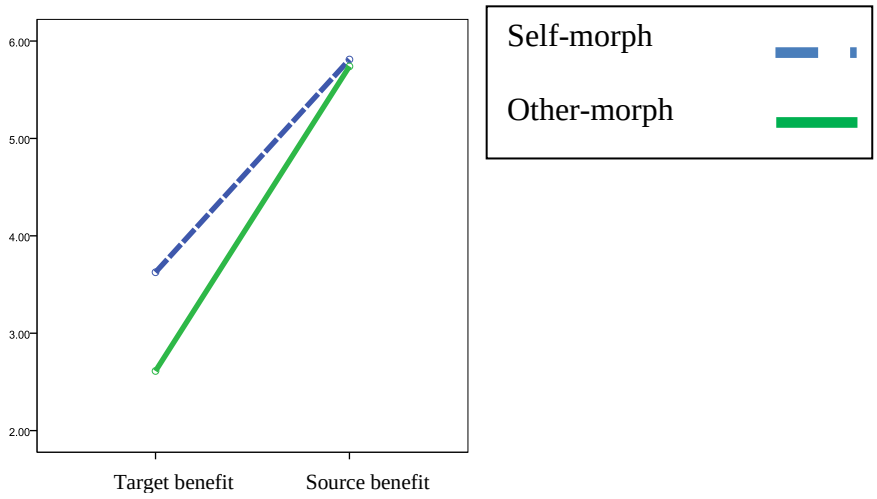
Similarity X Dominance

b. Perceived similarity

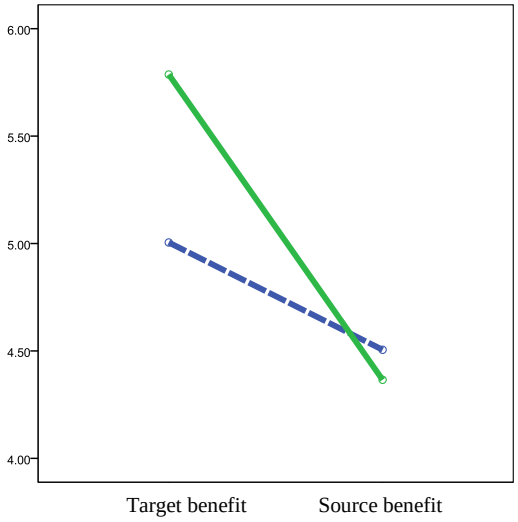


Benefit X Similarity

c. Perceived source benefit



d. Perceived target benefit



e. Assigned grade

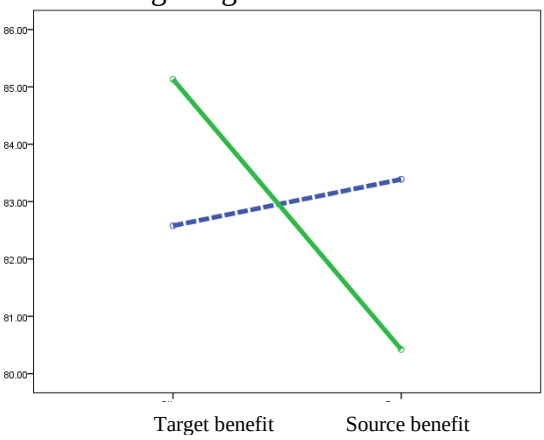


Figure 8.3. Significant repeated measures ANOVA interactions decomposed across individual messages.

82.82) than to self-morphed sources who gave a target benefit message (M = 82.36; see Table 8.4).

Benefit frame by dominance. One significant two-way interaction between benefit frame and dominance was found for perceived source benefit (η^2 = .07; see Table 8.2, Figure 8.3a). People low in dominance perceived a greater difference in selfishness between target and source benefit messages (B = 3.29) compared to people high in dominance (B = 2.08). Whereas perceptions of perceived source benefit did not differ for the source benefit message based on participant dominance, target benefit messages elicited varying perceptions of source benefit depending on participant dominance. That is, for target benefit messages, perceived source benefit shared a positive relationship with dominance. Put another way, as people's own dominance increased, so did their perceptions of a selfless source's selfishness (see Table 8.3).

Finally, planned comparisons were conducted to test the specific hypothesized three-way interaction. Planned comparisons in ANOVA resulted in significant effects of the ordinal contrast predictor for a few of the dependent variables (with 1 between degrees of freedom and 93 within degrees of freedom). In particular, the contrast was significant for perceived source benefit (F = 11.74, p =.001, partial η^2 = .11), perceived target benefit (F = 6.86, p =.01, partial η^2 = .07), perceived benefit to the average UMD student (F = 3.57, p =.03 one-tailed, partial η^2 = .04), goodwill (F = 9.72, p =.002, partial η^2 = .10), and trustworthiness (F = 8.91, p =.004, partial η^2 = .09). Among these variables, the hypothesized interaction significantly represented differences in attributions between groups after exposure to persuasive messages. Of

the eighteen contrasts tested, five (28%) were significant. Unlike the factorial ANCOVAs, the planned contrast provides support for the interaction expressed in the three hypotheses. Similar to the previous three experiments, but unlike Experiment 3, cognitive appraisals, rather than also affective ones, were predicted by the contrast.

Model Testing

Confirmatory factor analysis. The CFAs showed acceptable multigroup model fit with constrained measurements between groups of participants who were low and high in dominance, $\chi^2(1704) = 2809.70$, $p < .001$, RMSEA = .067, 90% CI = (.062, .071), CFI = .97, SRMR = .10.

Theoretical model testing. As detailed in Chapter 4, multigroup model testing occurred in three steps. First, the unconstrained multigroup model was run for those above and below median dominance, resulting in poor fit, $\chi^2(1629) = 3609.19$, $p < .001$, RMSEA = .162, 90% CI = (.155, .170), CFI = .86, SRMR = .09.

Second, the model was run with all structural parameters constrained to be equal for both groups, resulting in poor fit, $\chi^2(1672) = 3653.99$, $p < .001$, RMSEA = .161, 90% CI = (.153, 168), CFI = .86, SRMR = .12. Finally, modification indices were iteratively consulted and significantly different parameters between groups freed. This procedure resulted in no differences between people low and high in dominance.

Fit statistics resulted in apparent mispecified models. The incremental fit index of CFI demonstrated poor fit (i.e., ≥ .95; Hu & Bentler, 1999). The parsimony-adjusted measures of RMSEA resulted in poor fit (MacCallum, Browne, & Sugawara, 1996). The absolute fit index of SRMR also resulted in poor fit (Hu & Bentler).

Overall, the models did not fit the data acceptably, and interpretation of the model's parameters should be done with caution. It is possible the poor fit statistics result from the relatively small sample size compared to the previous experiments. Nonetheless, for the purpose of comparison to the previous experiments, the standardized structural parameters are reported in Table 5.4. Significant parameters are flagged within the table, and significant differences between groups of low and high dominant individuals are indicated. In addition, the graph of the model's significant parameters is found in Figure 8.4.

The proportion of variance explained in attitude was .14. The amount of explained variance in attitude was notably lower here than in the previous experiments, which further indicates a poor fitting model in which the exogenous variable is weakly predicted. Source similarity did not predict attitude or any intervening variables. Similarity's interaction with benefit frame—calculated by multiplying the dummy coded experimental variables, similarity (0 = *other-morph*, 1 = *self-morph*) and benefit frame (0 = *target benefit*, 1 = *source benefit*)—predicted competence ($\beta = 0.41$), but competence did not significantly predict attitude. Despite benefit frame significantly predict some intervening variables (i.e., likability, $\gamma = -0.44$; physical attraction, $\gamma = -0.38$; task attraction, $\gamma = -0.39$; competence, $\gamma = -0.32$; goodwill, $\gamma = -1.15$; similarity, $\gamma = -0.43$), no intervening variables significantly predicted attitude. The model does not support the hypothesized evolutionary explanation for similarity's effect on persuasion. *H4* was rejected.

Table 8.5. *Experiment 4 Structural Equation Unstandardized Parameter Estimates*

		γ Benefit	γ Similarity	γ Interaction	β
Likability		-0.44*	-0.47*	0.12	0.10
	R^2	.08			
Social attraction		-0.27	-0.18	0.12	-2.53
	R^2	.03			
Physical attraction		-0.38*	-0.11	-0.11	2.96
	R^2	.04			
Task attraction		-0.39*	-0.20	-0.05	-5.69
	R^2	.05			
Competence		-0.32*[a]	-0.07	0.41*	28.30
	R^2	.07			
Goodwill		-1.15***	-0.24	-0.50	5.48
	R^2	.19			
Trustworthiness		-0.41*	-0.03	0.13	-15.21
	R^2	.06			
Similarity		-0.43*[a]	-0.11	0.35	-5.54
	R^2	.05			
Positive affect		-0.36	-0.25	0.42	-5.09
	R^2	.04			
Message quality		-0.41	-0.38	0.41	-3.83
	R^2	.04			
Attitude		-1.90	1.34	1.20	
	R^2	.14			
Attitude (indirect effect)		-1.71	1.79	1.07	

Note. γ indicates path emerging exogenous variable. β indicates path emerging from intervening variable and ending in the endogenous variable (i.e., attitude). Significant differences resulted from multigroup analyses are separated by a slash (low dominance / high dominance). Tests are two-tailed unless otherwise indicated. *p < .05, **p < .01, ***p < .001. "[a]" indicates significance at the one-tailed level.

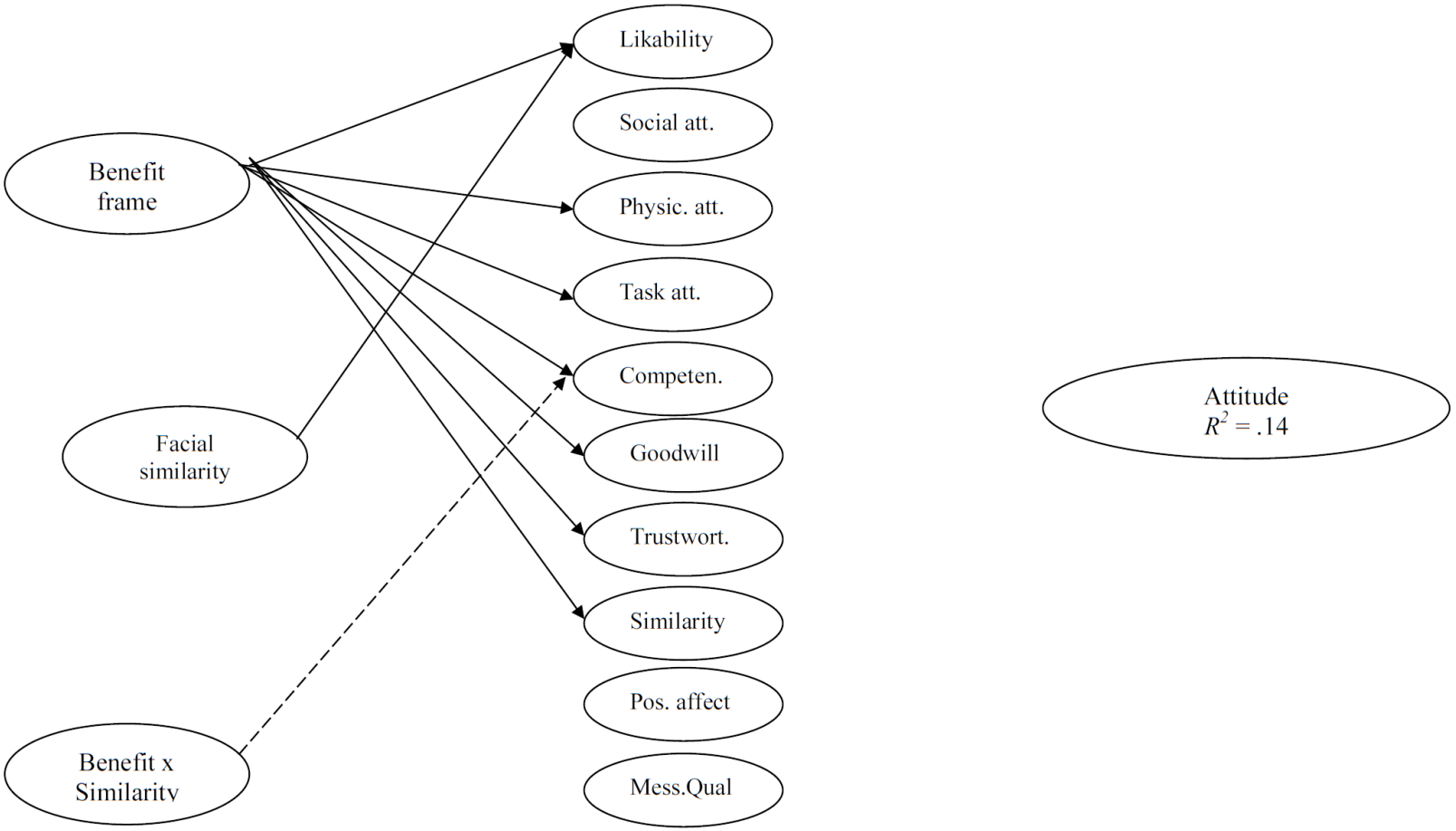


Figure 8.4. Experiment 4 structural model.
Note. Only significant paths are shown in the model. Solid lines indicate negative parameters. Dashed lines indicate positive parameters.

Discussion

The three-way interactional hypothesis was not supported. That is, less dominant people did not have more attitude change—or the cognitive attributions related to attitude change—from a self-interested (i.e., communicated source benefit frame) source with a self-morphed face than from a self-interested source with an other-morphed face (*H4a*; and vice versa for other-interested sources, *H4b*). Although some significant results appear to support a limited role of facial similarity in affecting persuasion and related cognitions, this source characteristic did not affect attitude as predicted.

Of the significant results, perhaps most supportive of an evolutionary explanation was the significant two-way interaction between source similarity and benefit frame on perceived benefit to the source and participant. Although people perceived essentially the same amount of source and target benefit to selfish (i.e., source benefit) sources in different similarity conditions, they perceived target benefit framed messages as more beneficial to source and less beneficial to themselves for self-morphed sources than for other-morphed sources. That is, when the source communicated interest in the well-being of others, participants perceived him as more selfish when he looked like them than when he did not look like them. Here, the presence of a kinship cue (i.e., exposure to the self-morphed face) signaled to participants that messages expressing an interest in benefiting others would actually benefit the source. Simply put, people thought the selfless source would benefit more from the advocated action when he looked like themselves (i.e., the people the source intended to benefit). Thus, people perceived the source's communicated message in

conjunction with the propositions put forth in genetic similarity theory (Rushton, Russell, & Wells, 1984) and kin selection (Hamilton, 1964): when individuals aid in the success of genetically related others, they aid in their own success.

The grade assigned to the source's speech partially supported the evolutionary prediction. People evaluated the speech more favorably for selfless other-morphs compared to selfish other-morphs (which was predicted for less dominant people, *H4b*). However, self-morphs were assigned essentially the same grade regardless of whether they emphasized self or target benefit. Whereas participants, regardless of their own dominance, appeared to inflict a penalty on a non-kin source for being selfish, they did not evaluate a kin-like source more negatively for wanting to benefit himself. Again, from a genetic standpoint, if the similar looking source were to benefit from the advocated action, so would the recipients indirectly because of kinship ties.

Perceived similarity to the source differed according to participant dominance and the source's facial similarity. Whereas participants low in dominance thought themselves more similar to the self-morph than to the other-morph, those high in dominance thought themselves more similar to the other-morph than to the self-morph. It appears that people low in dominance were more sensitive to phenotypic cues that indicate likelihood of preferential treatment by a source, which supports similar findings regarding the better perceptual accuracy of low dominant people in distinguishing dominant features in others (Watkins et al., 2010). However, similarity cues were not merely perceived as less different by highly dominant people, but the cues were perceived inaccurately. The latter finding—that highly dominant people

would perceived other-morphs as more similar—is puzzling from an evolutionary perspective. Were this evolutionarily motivated, perhaps people high in dominance are motivated to orient themselves toward out-group members to increase genetic diversity of potential mates despite the risk of potential conflict with nonkin.

Finally, this experiment continues to support the idea that people low in dominance are better able to detect messages of goodwill compared to those high in dominance. As in Experiments 1 and 2, people lower in dominance perceived target benefit messages as lower in perceived benefit to the source compared to those higher in dominance. This finding provides further evidence for the superiority of less dominant people in perceiving verbal cues of source beneficence.

Despite no support for the three-way hypothesized interaction in the factorial ANCOVAs, planned contrast provided more support for the predicted relationships. The contrast term significantly predicted a few dependent variables. These results provide reason to believe that the relationships between source similarity, communicated goodwill, and participant dominance functioned according to predictions. However, the fewest number of contrasts were predictive of dependent variables in this study compared to the other experiments. Besides perceptions of source and participant benefit, the only variables predicted by the contrast were goodwill and trustworthiness. These results were perhaps not surprising given that these variables have close theoretical connection to the manipulated variable of benefit frame.

Chapter 9: General Discussion

This chapter serves a number of functions. First, the chapter provides a summary of main findings from the individual experimental studies. Second, the chapter synthesizes and discusses implications of these findings. Third, the limitations of these studies are discussed. Finally, conclusions made from this research are presented and their significance explored.

Summary of Experimental Findings

Support for Interaction Hypothesis

Four experiments were conducted to assess the effect of sources' phenotypic characteristics on persuasibility of message targets. Participants were exposed to persuasive messages that emphasized the advocated action as either benefiting the source or targets. These messages were attributed to sources who differed according to manipulated phenotypic characteristics, which were argued to act as cues to genetic fitness. The general hypothesis tested in each study predicted that persuasibility was dependent on the interaction between source characteristic, communicated beneficence in the message, and participant dominance. In particular, it was expected that message targets with low dominance would be better persuaded by sources who possessed cues to fitness and were selfish rather than selfless (*Ha*), and would be better persuaded by sources who did not possess cues to fitness and were selfless rather than selfish (*Hb*). Conversely, those high in dominance would be better persuaded by sources who were selfless rather than selfish, regardless of the source's possession of fitness cues (*Hc*).

This hypothesis received little consistent support across message repetitions testing the same source cue within single experiments or between experiments that tested the effects of different source cues. Even when significant effects were found, the effect sizes were quite small. Table 9.1 presents the effect sizes (i.e., partial η^{2}'s) of significant main and interaction effects found across all four experiments in ANCOVA analyses. On the whole, these effect sizes are notably weak. Further, although several of the same dependent variables were significantly predicted in more than one study, rarely did the same independent variable or interaction terms serve as a predictor across all studies. In short, there were few replicable effects on the same dependent variables from ANCOVA analyses across studies.

Experiment 1 tested the hypotheses by using the phenotypic cue of facial symmetry as a marker for physical attractiveness, and therefore fitness. Although symmetrical faces failed to elicit greater perceptions of attraction, the cue nonetheless interacted with participant dominance to affect assessments of message quality. In particular, less dominant people perceived symmetrical sources as having given higher quality messages than did more dominant people. The additional independent variable of communicated benefit contributed to a three-way interaction, which only influenced positive affect among the host of dependent variables. This interaction supported the expected relationship, with those low in dominance having greater positive feelings after the message when it was given by a selfish, rather than selfless, symmetrized face, but experiencing

Table 9.1. *Summary of Significant Effects (η^2) of Repeated Measures ANCOVA Results Across Four Experimental Studies*

	Participant Dominance				Benefit Condition				Source Cue Condition				Benefit * Cue				Benefit * Dominance				Cue * Dominance				Benefit * Cue * Dominance			
Experiment	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
Dependent																												
Perceived source ben.				.04	.22	.18	.08	.25								.04	.01	.01		.07								
Perceived participant ben.		.02			.03	.03			.01		.03				.02	.05			.02				.03				.02	
Perceived avg. student ben.	.01		.01		.02	.03		.06																				
Likability											.02			.02			.01	.02								.02		
Social attraction	.02				.02													.02								.01		
Physical attraction	.01	.02									.03			.02												.01		
Task attraction		.02																										
Competence																												
Goodwill					.04	.05		.06			.02				.02								.02				.02	
Trustworthiness																												
Similarity											.05												.04	.04				
Source dom.																		.02										
Positive affect													.01		.03										.01		.03	
Attitude, direct	.02		.02							.02												.02						
Attitude, quasi-direct											.02																	
Issue importance											.07				.03								.07				.03	
Message quality											.03				.02						.01		.04				.02	
Message realism										.02					.03							.01						
Grade (trans)			.02		.02						.02					.04	.02									.01		

greater positive feeling after the message when it was given by a selfless, rather than selfish, asymmetrically-faced source. This pattern was reversed for people high in dominance.

Experiment 2 tested the hypothesis by using the phenotypic cue of facial masculinity as a marker for sexual dimorphism among male sources. Significant three-way interactions were found for the dependent variables of liking, social attraction, and physical attraction, but not in the predicted directions. Instead, people low in dominance showed no difference in positive attributions toward selfless sources, but liked selfish feminine sources more than selfish masculine sources. People high in dominance showed no difference in positive attributions for selfish sources, but liked selfless feminine sources more than selfless masculine sources. A similar relationship was found for positive attitudes: People low in dominance had more positive attitudes (i.e., for the direct measure) after exposure to a feminine source, whereas people high in dominance had more positive attitudes after exposure to a masculine source.

Experiment 3 tested the hypothesis by using the phenotypic cue of voice pitch as a marker for sexual dimorphism. A few significant three-way interactions were found that were mostly consistent with the prediction. For example, less dominant people felt more positive affect after exposure to messages from selfish, rather than selfless, deep voices, but felt more positive affect after exposure to messages from selfless, rather than selfish, high voices. The opposite pattern emerged for people high in dominance. This finding replicated the three-way interaction utilizing facial symmetry on positive affect reported in Experiment 1. Although there was some

slight variation in the interaction depending on the specific dependent variable in Experiment 3, the results for perceived target benefit, issue importance, and message quality were consistent in their story. That is, people of low dominance seemed to prefer selfish sources with deep voices and selfless sources with high voices, and vice versa for people of high dominance.

Experiment 4 tested the hypothesis by using the phenotypic cue of facial similarity as a marker for kin relation. No significant three-way interactions were found, but some two-way interactions provided partial support for hypotheses. For example, people assigned a slightly higher grade to self-morphed sources who were selfish rather than selfless, but assigned a significantly lower grade to other-morphed sources who were selfish rather than selfless. People also perceived self-morphs who emphasized target wellbeing as benefiting more from the advocated action than other-morphs who emphasized target benefit.

Overall, the results from the factorial ANCOVAs provide limited support for an evolutionary explanation of social influence. A considerable number of dependent variables were tested, and the majority of these were not significantly predicted by a three-way interaction. Of the twenty dependent variables tested, these studies averaged 2.5 significant three-way interactions. In Experiment 2, these interaction were functionally opposite from those expected. Despite only a handful of significant three-way interactions—two-way interactions were much more common—and low explained variance, consistent patterns across experimental studies reduce the chance that findings were solely due to Type 1 error. When interactions did exhibit statistical

significance, they were generally consistent across studies regarding how people varying in dominance reacted to source characteristics and message benefit frame.

However, compared to the results from factorial ANCOVAs, results from planned comparisons provided greater support for the hypothesized three-way interaction. A larger number of dependent variables were significantly predicted by the contrast term compared to the factorial analyses. These results may be due to the increased strength of the statistical test: The single degree of freedom test afforded greater ability for results to be significant. Whereas the factorial ANCOVAs were tests of discovery—significant differences between groups were assessed regardless of whether the differences were in line with the expected interaction—the planned comparisons were tests of confirmation—the data were assessed according to their corroboration with the single expected interaction by imposing an order to their mean differences. The latter test is perhaps a more simple and direct assessment of the hypotheses.

Among significant planned contrasts, those of perceived benefit (i.e., to source, target, and average UMD student) and goodwill were consistently predicted across all experiments. In all experiments, cognitive appraisals of the source and message, rather than affect appraisals, were typically predicted by the contrast. These results suggest that the expected interaction between source cue, benefit frame, and participant dominance functioned less on one's emotional reactions to persuasive messages than on one's thoughtful ones. The exception to this trend was for results from Experiment 3. Here, the planned contrast with voice pitch also predicted affective responses to the source and message. Perhaps targets of persuasion are more

likely to respond emotionally to auditory, rather than visual stimuli. It is also possible that auditory stimuli simply elicits stronger responses for all dependent variables, allowing for statistical significance among affective appraisals in this experiment despite having similar sample sizes, and statistical power, in the other studies.

On the whole, the planned comparisons provided stronger support for an evolutionary explanation to social influence. These results suggest reason to believe that the hypothesized three-way interaction may serve as an underlying explanation for how people of varying levels of dominance respond to selfish or selfless sources depending on the sources' phenotypes.

Support for Structural Models

Besides assessing predicted interactions, this research also tested structural equation models in order to assess the role of affective and cognitive responses to source cues in affecting attitudes. Mediation models were tested to determine whether source cues affected attitude directly while controlling for participant assessments of the source and message, indirectly via mediation of the cognitive and affective variables, or epiphenomenally whereby intervening variables were affected by source cue but did not significantly predict attitude. Models generally indicated that source characteristics did not significantly affect attitude in consistent ways. The whole of the evidence supports the conclusion that source cues had little direct or indirect influence on attitudes either through mediation or via a direct effect. Thus, the data garnered from these models are not well positioned to inform the previous question regarding paths to causality. Simply put, because few effects on attitude were found, the models do not support any of the possible outcomes. Instead, the models are able

to serve the secondary purpose of displaying significant effects differently and more dynamically although also permitting, when significant, the detection of indirect effects. Table 9.2 summarizes the significant structural parameters for each message in each experiment.

Facial symmetry (Experiment 1) had little influence on modeled mediators, and only had a marginally significant indirect effect on attitude in Message 1 when interacting with dominance: People low in dominance were more persuaded by the symmetrical source. Facial sexual dimorphism (Experiment 2) influenced a few modeled mediators, especially when interacting with benefit frame, but these intervening variables did not significantly affect attitudes. Facial masculinity had a direct effect on attitude for Message 2 when interacting with dominance—masculine sources were more persuasive for highly dominant individuals and feminine sources were more persuasive for less dominant individuals—but not in the predicted directions. Vocal sexual dimorphism (Experiment 3) demonstrated some evidence of a source characteristic influencing attitude via modeled mediators in Message 2. The interaction between voice pitch and benefit frame predicted message quality, and message quality predicted attitude. Further the interaction for Message 2 had a significant indirect effect on attitude. Last, facial similarity (Experiment 4) did not appear to influence attitude directly or indirectly, although it affected likability of the source. This summary indicates how these effects are inconsistent within repeated measures of the same phenotypic characteristic as well as between experiments utilizing different phenotypic characteristics.

Table 9.2. *Summary of Significant Structural Parameters Across Four Experimental Studies*

	Benefit Frame β				Source Cue β				Source Cue X Ben. Frame β				Attitude γ			
Experiment Dependent	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
Likability	1 2	1 2 3	2 3	1				1		2	2					
Social attraction	1* 2	1* 2 3	2 3													
Physical attraction	1			1		1	1			1 3			1	1	2	
Task attraction	1	2 3	2 3	1					1 2	2	2			3		
Competence	1	1 2 3		1						2		1	2	3		
Goodwill	1 2 3	1 2 3	2 3	1	2 3				1	2 3	2					
Trustworthiness	1 2	1 2* 3	2 3	1	2 3				1	2			123			
Similarity	1 2	1* 2	3	1	2 3		1 3*			1 2				3		
Source dominan.	n/a			n/a	n/a		1 2	n/a	n/a			n/a	n/a	3	13	n/a
Positive affect	1 2		2 3		1 3	3					2					
Message quality	1	2	2		1*				1	2 3	2		1 2 3	1 2 3	1 2 3	
Attitude, direct	2					2*										
Attitude, (indirect)	1* 2				1*						2					

Note. Numbers in boxes identify the message in which the parameter was significant. *Indicates that multigroup analyses resulted in significantly different parameter estimates between people low and high in dominance.
Source cues were facial symmetry (Experiment 1), facial sexual dimorphism (Experiment 2), vocal sexual dimorphism (Experiment 3), and facial similarity (Experiment 4).

Despite some studies providing inconsistent evidence of epiphenomenalism, partial mediation, or full mediation, the bulk of the evidence garnered from the models suggests that, when considering the panel of mediators holistically, phenotypic source characteristics have little causal influence on attitudes and related perceptions of sources and messages. Even when significant effects were found, there was little consistency across or within experiments. Consider the sparse consistent results across studies. No intervening variables were predicted by source cue, or its interaction with benefit frame, consistently in all three message within a single experiment.

Overall, the theoretical models resulted in acceptable fit for these data. Although the CFAs resulted in acceptably fitting measurement models, the structural models had slightly poorer fit according to Hu and Bentler's (1999) criteria. However, no models resulted in unequivocal excellent fit. For the structural models, only the CFI, as the incremental fit index, indicated models that just surpassed the threshold for good fit (i.e., > .95) across messages and experiments. The parsimony-adjusted measure of RMSEA resulted in mediocre fit (i.e., .08 - .10) across most messages and experiments. The absolute fit index of SRMR resulted in notably poor fit, with most models not even closely approaching the cut-off value of good fit of .08. On the one hand, such model fit indices generally suggest that the process by which people form attitudes is not the one theorized. On the other hand, the mediocre model fit allows one to have at least some confidence in the relationships, or lack of relationships, resulting among factors within the specified model. That is, source cues do not affect attitude according to the hypothesized process. The exception to this

statement is the model tests for Experiment 4, which resulted in an apparent misspecified model.

Implications

Perhaps the most consistent finding across studies is how recipients of persuasive messages differ in their reactions to the source based on their own dominance. Participant dominance interacted with the manipulated independent variables of source cue and message benefit frame, both independently and together, to influence judgments about the source and the message. How participant dominance interacted with the qualities of the source and message has implications for an evolutionary explanation of social influence.

One key consistent finding was the two-way interaction between participant dominance and perceived benefit to the source or target. In three out of four studies (i.e., Experiments 1, 2, and 4), it appeared that participants low in dominance perceived greater differences between the source benefit and target benefit frames than did those high in dominance. Experiment 3 replicated this finding with a significant three-way interaction. This finding supports other research regarding highly dominant people's lack of perceptual discernment regarding others' nonverbal phenotypic cues to dominance (Watkins, Fraccaro, Smith, Vukovic, Feinberg, & DeBruine, 2010). It appears that people higher in dominance, compared to their lesser dominant counterparts, are not as attuned to verbal cues to dominance (via communication of selfishness or selflessness) in others. Indeed, this makes sense in light of evolutionary theory. Whereas those low in dominance may need to avoid harm from or depend on resources from others, more dominant people possess the

capability to acquire these resources on their own. Low dominants needed to attend to the dominance of others to increase their fitness, but high dominants did not.

However, contrary to the Watkins and colleagues' (2010) findings, targets high in dominance did show perceptual sensitivity toward phenotypic cues to dominance in others. For example, people high in dominance judged message quality to be lower in symmetrical rather than asymmetrical sources, liked more feminine sources than masculine sources, and felt more positive after a selfish high pitched or selfless deep pitched source rather than a selfless high pitched source. Such differences were not expected. These results suggest that highly dominant people are wary of dominant others who might pose as a threat, but they are willing to consider arguments from those who do not pose as a threat. After all, deference to (i.e., aligning one's attitude with) a less dominant source does not necessarily threaten the leadership of a dominant message recipient as would deference to a source of equal or greater dominance.

That people high in dominance perceived differences in the phenotypic characteristics of others, which serve as signals to fitness, suggests that the perception of an interpersonal threat is relevant to humans of all dominance levels during influence situations. This study found that those high in dominance may be better persuaded by dominance in others according to the sources' communicated beneficence. Although it would behoove someone low in dominance to follow a selfish dominant source, such a source may threaten the anticipated success of a fellow dominant person, especially when the source does not provide assurances of goodwill. For highly dominant people, following the direction of, taking advice from,

or cooperating with competitors (i.e., selfish and fit others) with the capability to diminish one's own access to resources would therefore not be adaptive as would be for a person who would not otherwise have access to those resources (i.e., someone with low dominance). If, on the other hand, a source did not possess phenotypic cues to fitness, a person high in dominance would not feel threatened. Due to this lack of threat, people high in dominance may view selfish messages from such people as more credible (e.g., highly dominant people perceived sources who gave source benefit messages to be more socially attractive [Experiment 1] and realistic [Experiment 3]), and therefore judge them more positively. This is a novel finding with consistent support across experiments.

In cases where significant three-way interactions were present, which were the exception rather than the norm, people low in dominance essentially reacted in a reverse fashion from their dominant counterparts: They made more positive attributions toward selfish sources, rather than unselfish sources, who had phenotypic fitness-signaling characteristics, but made more positive attributions toward unselfish sources, rather than selfish sources, who lacked phenotypic cues to fitness. It appears that those low in dominance are able to distinguish how to react to capable leadership as well as to other people who are less capable but still well-intentioned. The one exception to this predicted relationship was found for facial sexual dimorphism. Targets low in dominance reacted more positively to selfish feminine sources and selfless masculine sources than to selfless feminine sources and selfish masculine sources. Although this interaction was the opposite of what was expected, it supports some research that questions whether masculine facial traits are always evaluated

positively. For example, although evidence typically shows that masculine traits are perceived as attractive (Grammer & Thornhill, 1994), other studies found that femininely shaped male faces are considered more attractive (Berry & McArthur, 1985; Penton-Voak et al., 1999; Perrett et al., 1998). Such differences in findings led researchers to question whether attractiveness toward male faces is based solely on assessments of genetic fitness (Little, Jones, Penton-Voak, Burt, & Perrett, 2002), but also on other factors like personality traits. Perrett et al. showed that masculine male faces are perceived as more dominant but also as more dishonest. The current research did not show differential assessments of dominance or honesty based on facial sexual dimorphism alone. However, this research (i.e., Experiment 2) showed that a masculine male's communication of goodwill (i.e., target benefit frame) may alter assessments made about him. When a male source with a masculine face gave verbal reassurances of goodwill, people evaluated him more positively than if he emphasized his own well-being. Here, verbal communication moderated the effect of nonverbal facial masculinity on perceptions of attractiveness.

Although masculine faces were generally evaluated less positively than feminine faces among less dominant people, masculine voices had the opposite effect. Whereas people low in dominance evaluated a selfless masculine face more positively than a selfish one, they evaluated a selfish deep voice more positively than a selfless one. Why people differentially assess facial and vocal characteristics, which should similarly signal cues to genetic fitness such as dominance (Puts et al., 2007), is puzzling. Perhaps vocal cues of dominance do not elicit associated negative personality attributions that are made toward facial cues of dominance (Little et al.,

2011). Why perceptions of masculinity differ after exposure to facial and vocal cues warrants further research. How the simultaneous presentation of both visual and auditory stimuli affect perceptions of masculinity should also be of interest.

One interpretation of the significant interactions between source characteristics and communicated benefit frame is that source credibility perceived by message recipients is both Aristotelian (communication within a message affects attributions regarding a source) and Ciceronian (characteristics of the source that are independent of the message affect attributions regarding a source). Although communicated benefit frame and phenotypic source characteristics affected source and message perceptions, it was the interaction of these two variables that provided the most theoretically meaningful results. People appear to attend to and synthesize nonverbal and verbal information simultaneously, and this synthesis is different for people with different levels of dominance.

Limitations

As with all research, the studies presented here are not without limitations. A number of methodological shortcomings should be considered when interpreting results. Discussed below, the first three address limitations to the studies' internal validity and the last two addresses limitations to external validity.

First, the manipulation checks on the source characteristic inductions did not result in significant differences. In concert with the other independent variables, main effects for source characteristics were nonexistent: Symmetrical faces were not perceived as more attractive, masculine faces were not perceived as more dominant, deeper voices were not perceived as more dominant, and self-morphed faces were not

perceived as more similar. On the one hand, the lack of significant manipulation checks suggests that the manipulations were ineffective. Weak manipulations may account for the relative lack of findings among dependent variables. On the other hand, previously published research has shown the efficacy of the photographic manipulations used to manipulate facial symmetry (Little et al., 2007; Quist et al., 2012; Watkins et al., 2012) and facial masculinity (Jones et al., 2011; Watkins et al., 2010; Welling et al., 2013), as well as the efficacy of similar auditory manipulations of voice pitch (Feinberg et al., 2008; Jones et al., 2008, 2010; Tigue et al., 2012; Vukovic et al., 2008) and photographic manipulations of similarity (Debruine, 2002; Krupp, DeBruine, & Barclay, 2008). That is, these exact stimuli (in Experiments 1 and 2) and previously validated methods (in Experiments 3 and 4) gave reason to expect the manipulations would be successful. Further, research shows that stimuli can alter people's perceptions even when they do not realize or report any changes (E. L. Fink, Monahan, & Kaplowitz, 1989; Zajonc, 1980). Indeed, that source characteristics affected persuasion-related attributions even when they did not elicit differences in manipulation checks suggests that manipulations were successful.

Despite nonsignificant manipulation checks, that significant findings resulted from participants' exposure to the phenotypic cues is somewhat remarkable, especially for the experiments utilizing facial stimuli. Aside from being instructed to "view the photograph of the student speaker and read each speech," no additional prompts directed participants to concentrate on the face or look at it for an extended period of time. Further, the photograph was relatively small—only 240 x 320 pixels, which roughly corresponds to a size of 2.5 by 3 inches (6.4 by 7.6 centimeters)

depending on computer monitor resolution—so discerning details of the face may have been difficult. This small size was necessary to disguise inaccuracies during the morphing process in Experiment 4. Future studies would do well to test the effects of larger photographs and direct participants to study the faces before being exposed to the messages attributed to them. If this study engaged in these methods, perhaps significant manipulation checks would result, and more and larger effects could be found.

Second, the studies in which previously developed source stimuli were used (i.e., Experiments 1 and 2) are limited in the extent to which little is known about the photographs other than they were used in previous research. The faces may possess qualities that skew the results reported here. For example, it is possible that the three faces used for the sexual dimorphism manipulation have higher mean dominance regardless of the dimorphism manipulation: The faces utilized in Experiment 2 actually resulted in mean dominance scores slightly higher than the scale's midpoint. If this were the case, even the feminine face manipulations would have been relatively high in perceived dominance compared to the average male face. It is possible that the expected effects only appear for feminine faces that are below average for masculine dimorphism. Because there are no data to describe the relative masculinity of the faces used (ideally, before they were manipulated into masculine and feminine or symmetrized or asymmetrical versions), this claim cannot be assessed here. Future studies should use faces in which baseline assessments are made before the images are digitally altered.

Similarly, the voice actors used in Experiment 3 were not selected because of their relative neutral voices. The initial pitch data reported (see Table 7.1) indicate some variation in depth of the actor's voices, but the study did not deliberately use pitches representative of the entire range of men's voices. Perhaps the effect of voice pitch only occurs at certain depths. For example, Message 3, which appeared to account for most interactive effects found in the significant repeated measures tests, used a voice whose original mean hertz was 121. The average male voice pitch is 120 Hz (Tigue et al., 2012). The other voices had higher mean pitches originally, which may be why the effects found in Message 3 appeared to a lesser extent in the other messages.

Third, the design for these experiments created confounds between the speech and the phenotypic cue assigned to the source of that speech. That is, it is impossible to separate the persuasive effect of the speech from that of the speaker. This is an important point because some of the effects within experiments were found in some repeated messages but not all. For example, it is possible that the evolutionary effect only occurs for relatively ugly faces or for relatively entertaining messages. Isolating the effect of the source from the message cannot be done here.

Another confound may be present in the auditory stimuli utilized in Experiment 3. In an attempt to retain the most experimental control possible, differences in wording in the source benefit recording were spliced into the target benefit recording. Although this retained control over the verbal message, the different splices resulted in slightly different speech lengths and average voice pitches across conditions (see Table 7.1). These differences were so slight that it is unlikely

that they account for effects on the dependent variables, but the possibility remains that the confounding variables of speech length and average pitch, which vary across both the pitch and benefit frame conditions, account for the findings.

Fourth, these experiments were conducted via an internet Website. Online experiments do not allow the same procedural control compared to lab experiments. In effect, participants in the same experimental condition may differ in their exposure to the stimulus. For example, participants in this study may have viewed differently sized photographs based on the size and resolution of their computer screens, whereas a lab experiment would allow the precise control of photograph size to be consistent across participants. Despite this limitation, online experiments generally elicit similar results to those observed in a lab (Krantz & Dalal, 2000) even in situations in which only small differences constitute the manipulations of independent variables (Eichstaedt, 2002; Franci, Neath, & Suprenant, 2000). Still, it is possible that participants react to persuasive messages differently online than in person. To the extent that this difference occurs, these findings' generalizability it limited.

Finally, the experiments are limited in the extent to which they can generalize to interpersonal influence situations. The sources used in these studies were all college aged, male, and of apparent Caucasian background. Although this choice was made in order (a) to test evolutionary hypotheses about people's tendencies to be persuaded by male leaders and (b) to hold constant other possible variables that influence source persuasiveness, thereby increasing the internal validity of the studies, targets may react differently to sources who are female or of different ethnicities and ages. Further, because a college student convenience sample was used,

messages were written about controversial policies specific to the university from which the sample was taken. The scope of the topics and participants used in these studies obviously further limit the findings' generalizability to all persuasive situations.

Conclusion

The goal of this research was an ambitious one: To apply evolutionary theory in order to make sense of the extensive research findings about how source characteristics affect audience susceptibility to persuasive messages. The general argument in this dissertation was that humans, as recipients of persuasive attempts, adapted to be more or less influenced by sources based on those sources' perceptible phenotypic cues. Although these studies found little consistent support to conclude that persuasibility functions as an evolved psychological mechanism, there was some evidence (e.g., the planned comparisons) to endorse an understanding of persuasion as (a partly) biological phenomenon.

Such evidence was found in the differential reactions to source characteristics based on verbal declarations of goodwill and target dominance. Were a general halo effect (Nisbett & Wilson, 1977) at play, one would expect people to make positive attributions toward sources regardless of their own dominance or communicated beneficence. Essentially, only main effects of source cue and benefit frame would be expected according to a "what is beautiful is good" justification (Dion et al., 1972). That is, people should have felt more positively after reading a message attributed to a more symmetrical face, and, presumably, when the message emphasized their own wellbeing (i.e., communicated selflessness). However, people low in dominance, for

example, were found to feel more positively after exposure to a symmetrical selfish source and asymmetrical selfless source compared to a symmetrical selfless source and asymmetrical selfish source. Further, these results were reversed for people high in dominance. These results are difficult to rationalize other than by utilizing an evolutionary explanation. That is, results like these support the idea that people low in dominance are better persuaded by sources who possess cues to fitness and are selfish rather than selfless (*Ha*) and by sources who do not possess cues to fitness and are selfless rather than selfish (*Hb*), whereas those high in dominance are better persuaded by sources who are selfless rather than selfish, regardless of the source's possession of fitness cues (*Hc*). That similar effects were replicated with varying phenotypic cues gives credence to the validity of an evolutionary approach to the study of source characteristics on target persuasiveness. Significant effects were rare, but when they were significant, they all told a similar story.

Persuasibility as an evolved tendency has implications for message tailoring. A message designer's access to information about audience members could allow for the selection of a source with the characteristics that would best elicit attitude change. For example, voiced-over or aurally narrated persuasive messages to less dominant audiences should emphasize goodwill if the source has a higher voice but not if the source has a deeper voice. When targeting people with higher dominance, an oral message should include reassurances of goodwill when the source has a deep voice but not if the voice is high. Or, to elicit positive affect, persuasive print messages may use selfish symmetrical sources or selfless asymmetrical sources among people lower in dominance, but the opposite pairs when targeting those higher in dominance. How

these cues affect persuasion in different situations (e.g., intergroup competition) is a question for future research.

Further exploration of how source characteristics, as indicators of genetic fitness, affect persuasibility is warranted. Not only can facial symmetry, facial and vocal masculinity, and facial similarity be further studied in isolation and in combination, other cues can be hypothesized and tested to affect persuasion in similar ways. For example, body type and size (Lassek & Gaulin, 2009), facial expression (Andrew, 1963), and facial hair (Neave & Shields, 2008) all have evolutionary ties to genetic fitness and should affect targets of persuasion accordingly.

Finally, an evolutionary explanation for persuasion has implications for those who study the phenomenon in the fields of communication, marketing, and psychology. It is generally thought that source credibility is "not an intrinsic property of a communicator" (O'Keefe, 2002, p. 181). Indeed, this research treated credibility as attributed to sources by message recipients. However, the experiments reported here question whether, and provide some evidence to suppose that, perceptions of source credibility are at least partly intrinsic to the people receiving the messages rather than to the ones giving them.

In one sense, these results may seem dissatisfying in regards to providing an overall explanation for how phenotypic source characteristics affect persuasive situations according to evolutionary theory. Support for the evolutionary hypothesis was rare among the panel of variables tested here. Significant results were sometimes even inconsistent (i.e., facial and vocal cues of sexual dimorphism elicited opposite effects). Further, little evidence emerged from causal models to suggest that the

source characteristic by benefit frame by participant dominance interaction directly or indirectly affected attitude after accounting for attributions toward the source and message. However, some results do show some consistency across studies, suggesting that the relationships tested here do affect message recipients in persuasive situations. In this sense, the results are encouraging despite having some inconsistencies. This evidence may then inform us as to why perceptible source cues have a tendency to be processed heuristically (Chaiken, 1980; Petty & Cacioppo, 1981). Although the results presented in the current dissertation are not fully conclusive, it should lead scholars to further question and investigate the potential for evolutionary tendencies to affect how people are persuaded.

Appendix A: Messages used in Main Experiments

Experiment 1

Message 1: Source benefit

Speech Title: Football Ticket No-Show Policy Too Harsh

Everyone knows that the ticketing process for students to go to football and basketball games is a hassle. It is hard to keep track of the Loyalty Points lottery system. The window to sign up for and then claim tickets is small. But, what is really unacceptable is the no-show policy. I like Maryland sports, and I want the stands filled as much as the next fan. But the no-show policy is ridiculous and contributes to low attendance at the games. As someone who has been personally affected by the no-show policy, the no-show policy needs a change. For my sake, this unfair policy must end. The no-show policy works like this. I am limited in the number of times per season and the total number of times during my Maryland career that I can be a no-show for games. All it takes is for me to accumulate five total no-shows across multiple seasons for me to be banned from obtaining football tickets for the rest of my time at UMD. For instance, I had two no-shows freshman year, two sophomore year, and one junior year, and I am ineligible to get football tickets at all my senior year. This policy is outlandish, especially because the student section a UMD football games can sometimes seem like a graveyard. In the last four years, it's never been filled to capacity, even for Homecoming games. It is simply unfair to punish me for missing previous games by withholding tickets when there are hundreds of unclaimed tickets still available sitting unused. It's not that hard to be considered a no-show. If I've reserved tickets and later realize I can't go, I have to cancel them online more the 24 hours before the game in order to avoid being a no-show. For the games missed, I didn't even know that I had to miss the games until the cancellation deadline had already passed. I have also shown up to games a few seconds after the check-in period ends, and I was considered a no-show. I didn't even know about the harsh no-show policy until it was too late. Unfortunately, the no-show policy has affected my ability to get football tickets my senior year. It is understandable how such a policy could be applied to sporting events where tickets are more limited and in higher demand, like basketball. But even basketball games allow more than five no-shows before banning students from being eligible for tickets for the rest of their academic careers at Maryland. It would make more sense for students to have around 12 no-shows before they are disqualified from future football tickets. If I want to go to football games my senior year, but have missed a few games in the previous three years, I should have the right to qualify to get student tickets. My future wellbeing as a UMD sports fan is at stake. Change the no-show policy now.

Message 1: Target benefit

Speech Title: Football Ticket No-Show Policy Too Harsh

Everyone knows that the ticketing process for students to go to football and basketball games is a hassle. It is hard to keep track of the Loyalty Points lottery

system. The window to sign up for and then claim tickets is small. But, what is really unacceptable is the no-show policy. I like Maryland sports, and I want the stands filled as much as the next fan. But the no-show policy is ridiculous and contributes to low attendance at the games. Even though I have not been personally affected by the no-show policy, the no-show policy needs a change. For the sake of all UMD students, this unfair policy must end. The no-show policy works like this. Students are limited in the number of times per season and the total number of times during their Maryland careers that they can be a no-show for games. All it takes is for you to accumulate five total no-shows across multiple seasons for you to be banned from obtaining football tickets for the rest of my time at UMD. For instance, if you had two no-shows freshman year, two sophomore year, and one junior year, you would be ineligible to get football tickets at all your senior year. This policy is outlandish, especially because the student section a UMD football games can sometimes seem like a graveyard. In the last four years, it's never been filled to capacity, even for Homecoming games. It is simply unfair to punish students for missing previous games by withholding tickets when there are hundreds of unclaimed tickets still available sitting unused. It's not that hard to be considered a no-show. If you've reserved tickets and later realize you can't go, you have to cancel them online more the 24 hours before the game in order to avoid being a no-show. For the games missed, many students don't even know that they had to miss the games until the cancellation deadline had already passed. Students have also shown up to games a few seconds after the check-in period ends, and they were considered a no-show. Many student don't even know about the harsh no-show policy until it is too late. Fortunately, the no-show policy hasn't affected my ability to get football tickets my senior year. It is understandable how such a policy could be applied to sporting events where tickets are more limited and in higher demand, like basketball. But even basketball games allow more than five no-shows before banning students from being eligible for tickets for the rest of their academic careers at Maryland. It would make more sense for students to have around 12 no-shows before they are disqualified from future football tickets. If you want to go to football games your senior year, but have missed a few games in the previous three years, you should have the right to qualify to get student tickets. All students' future wellbeing as UMD sports fans is at stake. Change the no-show policy now.

Message 2: Source benefit

Speech Title: More Student Fees to Hire Counselors at Counseling Center

When I sign up for an appointment at the university Counseling Center, I might have to wait weeks in order to meet with a counselor. This is problematic given that many students need counseling in emergency-type situations. They simply can't wait a month for an appointment if they're on the verge of a nervous breakdown or being suicidal. Even students with emergency cases have waited up to a week to get an appointment at the counseling center. This is unacceptable should I need counseling. But you can do something about it. Because I'm a student who utilizes the counseling services on campus, this unsafe practice of long wait times at the counseling center needs to end. Students like me shouldn't have to wait when counseling is needed. Since I go to counseling, I would directly benefit from raising

student fees that go toward the Counseling Center. More student fees would lead to an easier time scheduling counseling for students like me. Once a student gets counseling, the problem doesn't stop there. It can take up to a month to get a follow-up appointment. The center is understaffed. The center has seen a 12 percent increase in students seeking services from last year, but there has been no additional staff members hired. If I find myself in a situation where I need counseling, be it career advice or for a mental health emergency, I don't want to sit around for four weeks while I wait for an appointment. That isn't fair to me. It is normal for college students to seek counseling, and more and more students are seeing counselors at UMD. An increase in student fees is reasonable to allow me more convenience when obtaining counseling services. A mandatory fee increase of 15 dollars a semester for all students would allow the center to hire an additional number of full time counselors. I use the Counseling Center, and I am willing to contribute more in student fees on my behalf should I ever need to be counseled on campus. Counseling resources simply aren't helpful if I cannot access them. Fifteen dollars more a semester could mean the difference between life and death. Higher fees mean more counselors.

Message 2: Target benefit

Speech Title: More Student Fees to Hire Counselors at Counseling Center

When you sign up for an appointment at the university Counseling Center, you might have to wait weeks in order to meet with a counselor. This is problematic given that many students need counseling in emergency-type situations. They simply can't wait a month for an appointment if they're on the verge of a nervous breakdown or being suicidal. Even students with emergency cases have waited up to a week to get an appointment at the counseling center. This is unacceptable should you need counseling. But you can do something about it. Although I'm not a student who utilizes the counseling services on campus, this unsafe practice of long wait times at the counseling center needs to end. But other students, like you, shouldn't have to wait when counseling is needed. Since I don't go to counseling, I wouldn't directly benefit from raising student fees that go toward the Counseling Center. More student fees would lead to an easier time scheduling counseling for students like you. Once a student gets counseling, the problem doesn't stop there. It can take up to a month to get a follow-up appointment. The center is understaffed. The center has seen a 12 percent increase in students seeking services from last year, but there has been no additional staff members hired. If you find yourself in a situation where you need counseling, be it career advice or for a mental health emergency, you don't want to sit around for four weeks while you wait for an appointment. That isn't fair to you. It is normal for college students to seek counseling, and more and more students are seeing counselors at UMD. An increase in student fees is reasonable to allow you more convenience when obtaining counseling services. A mandatory fee increase of 15 dollars a semester for all students would allow the center to hire an additional number of full time counselors. I don't use the Counseling Center, but I am willing to contribute more in student fees on your behalf should you ever need to be counseled on campus. Counseling resources simply aren't helpful if you cannot access them.

Fifteen dollars more a semester could mean the difference between life and death. Higher fees mean more counselors.

Message 3: Source benefit

Speech Title: Extend the Good Samaritan Policy

Most of you are probably familiar with UMD's Good Samaritan Policy. The policy, which was passed by the University Senate two years ago, provides amnesty for students who call 911 in order to help a dangerously drunk friend or themselves. Simply put, students can't get in trouble if they seek help in an alcohol related emergency. The policy protects underage students, even if they have been drinking themselves, with the goal of encouraging people to seek aid when it is needed. The policy has been overwhelmingly successful at Maryland; many more underage students are saved from serious injury or potentially even death because friends have called on their behalf. Despite its success, the policy does not go far enough. We need an all-inclusive Good Samaritan Policy on campus that includes protection against drug use. The Senate Executive Committee will soon be voting on such a policy. I know a comprehensive policy would help me. This policy would directly influence me for the better. I'm not a drug user, but one of my roommates uses drugs. Even though I try to get him to stop, he's got a problem. There have been times when I have been worried about the safety of my friend. But I also worry that if I call on behalf of my friend, I will be seen as complicit in his drug use for not reporting it previously and get in trouble myself. An all inclusive Good Samaritan policy will protect students like me. Because I know I'd have security from university sanctions, I wouldn't hesitate to call if my friend needed help. In emergency situations, hesitation could mean the difference between life and death for someone who has overdosed. This would be better for my friend, but it'd also be better for me. The comprehensive Good Samaritan policy would not violate Maryland law, and is hands down a good idea. For the sake of drug users, and more importantly for the people who would call on their behalf, such as myself, expand the Good Samaritan policy to include drug use. It will help me more than you know.

Message 3: Target benefit

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Most of you are probably familiar with UMD's Good Samaritan Policy. The policy, which was passed by the University Senate two years ago, provides amnesty for students who call 911 in order to help a dangerously drunk friend or themselves. Simply put, students can't get in trouble if they seek help in an alcohol related emergency. The policy protects underage students, even if they have been drinking themselves, with the goal of encouraging people to seek aid when it is needed. The policy has been overwhelmingly successful at Maryland; many more underage students are saved from serious injury or potentially even death because friends have called on their behalf. Despite its success, the policy does not go far enough. We need an all-inclusive Good Samaritan Policy on campus that includes protection against drug use. The Senate Executive Committee will soon be voting on such a policy. I know a comprehensive policy would help many students. This policy would not directly influence me, but it would influence others for the better. I'm not a drug user,

and I don't really know anyone well who uses drugs. I can imagine there have been times when people have been worried about the safety of a friend that uses drugs. But they probably also worry that if they call on behalf of their friend, they will be seen as complicit in his drug use for not reporting it previously and get in trouble themselves. An all inclusive Good Samaritan policy will protect students like that. Because they would know they have security from university sanctions, they wouldn't hesitate to call if their friend needed help. In emergency situations, hesitation could mean the difference between life and death for someone who has overdosed. This would be better for the drug users, but it'd also be better for the people who report them. The comprehensive Good Samaritan policy would not violate Maryland law, and is hands down a good idea. For the sake of drug users, and more importantly for the people who would call on their behalf, such as yourself, expand the Good Samaritan policy to include drug use. It will help others more than you know.

Experiment 2

Message 1: Source benefit

Speech Title: Religious Observance Policy Needs Extension
Most UMD students are absent at least once throughout the semester due to an excused religious observance. For example, during the spring semester, many Jews go home for Passover and many Christians go home for Good Friday. The university officially excuses these absences in order to allow people to celebrate with their families. However, the university does not excuse the long day of travel needed for some out-of-state students to visit their families before the actual excused holiday. I think the university should amend their policy to also excuse an absence caused by the additional day needed by people who live far from College Park to travel home for a holiday. Unfortunately, my family lives far from College Park, so I actually need this extra travel day. Such a day is currently considered an unexcused absence. Last year, I knew a student at UMD from Houston who traveled to be with his family for a religious holiday. Because he had to fly out a day early in order to actually be with his family on the holiday, he also missed his classes that day. He missed a completion quiz on that day in a notably hard class required for his major. The professor did not allow him to retake the quiz because it was administered on a day that wasn't officially excused. You know what? He failed the class by less than the amount of the completion quiz. After losing a grade appeal…the absence wasn't excused after all…he currently is retaking the course. Students like me who might need a travel day prior to an excused religious observance should have that day excused. It wouldn't be hard to regulate such a policy. The student would simply need to provide documentation of an airline ticket, for example. Such a policy is necessary because many professors deliberately make due dates for assignments or exams the day before an excused holiday solely as a manner of principle that students should be in class. It's not fair for those who must travel to see their families the next day. I need the extra travel day since I live so far. I can honestly say that the current policy is prejudiced, and an additional travel day for out-of-state students should be excused. Do it for me. Do it for those who need to be with their families during holidays.

Message 1: Target benefit

Speech Title: Religious Observance Policy Needs Extension

Most UMD students are absent at least once throughout the semester due to an excused religious observance. For example, during the spring semester, many Jews go home for Passover and many Christians go home for Good Friday. The university officially excuses these absences in order to allow people to celebrate with their families. However, the university does not excuse the long day of travel needed for some out-of-state students to visit their families before the actual excused holiday. I think the university should amend their policy to also excuse an absence caused by the additional day needed by people who live far from College Park to travel home for a holiday. Fortunately, my family lives close to College Park, so I don't need this extra travel day. Such a day is currently considered an unexcused absence. Last year, I knew a student at UMD from Houston who traveled to be with his family for a religious holiday. Because he had to fly out a day early in order to actually be with his family on the holiday, he also missed his classes that day. He missed a completion quiz on that day in a notably hard class required for his major. The professor did not allow him to retake the quiz because it was administered on a day that wasn't officially excused. You know what? He failed the class by less than the amount of the completion quiz. After losing a grade appeal…the absence wasn't excused after all…he currently is retaking the course. Students like you who might need a travel day prior to an excused religious observance should have that day excused. It wouldn't be hard to regulate such a policy. The student would simply need to provide documentation of an airline ticket, for example. Such a policy is necessary because many professors deliberately make due dates for assignments or exams the day before an excused holiday solely as a manner of principle that students should be in class. It's not fair for those who must travel to see their families the next day. I don't need the extra travel day since I live so close. I can honestly say that the current policy is prejudiced, and an additional travel day for out-of-state students should be excused. Don't do it for me. Do it for those who need to be with their families during holidays.

Message 2: Source benefit

Speech Title: Say "No" to Rent Caps in College Park

The City of College Park has begun to enforce a law that limits the amount that landlords of College Park houses can charge for rent. On the surface, the idea seems beneficial to Maryland students who rent homes in nearby neighborhoods, but it actually has the potential to make students ultimately pay more. Being a renter in a College Park house, I am affected by this policy. Since I have a vested interested in this issue, I can tell you that my rent will end up being cheaper by NOT limiting rent amounts for College Park landlords. For my sake, oppose the law. You see, the law says that landlords can only charge a maximum rent of 0.6 percent of a house's value. So, a house worth $200,000 would have a total max rent-cap of $1,200 per month. Although this seems good for students, the problem is that most property owners will have to sell their homes because it is no longer profitable to rent them out. Fewer houses means that more students will have to move into the high-rise

apartments around campus. Here's the catch…these high-rise apartments are not bound by the rent-cap law. Which means, after I are forced out of the neighborhoods, I will have to pay the higher rent prices in apartments like University View or Mazza Grandmarc. If the law is enforced, within a year the houses for rent in College Park could be non-existent. I wouldn't be able to rent affordably in College Park. For my sake, oppose the law. Instead of an unconstitutional rent-cap law for College Park houses, landlords should be allowed to let the free-market govern rental prices for houses in the neighborhoods. That way, I will have the opportunity to get fair and competitive rents, not overinflated rents that high-rise apartments charge. Do I want to live in an expensive high-rise apartment compared to a cheaper and unique house in College Park? Of course not. For my sake, oppose the law.

Message 2: Target benefit

Speech Title: Say "No" to Rent Caps in College Park

The City of College Park has begun to enforce a law that limits the amount that landlords of College Park houses can charge for rent. On the surface, the idea seems beneficial to Maryland students who rent homes in nearby neighborhoods, but it actually has the potential to make students ultimately pay more. Being a renter in a Silver Spring house, I am not affected by this policy. Since I do not have a vested interested in this issue, I can tell you that your rent will end up being cheaper by NOT limiting rent amounts for College Park landlords. For your own sake, oppose the law.

You see, the law says that landlords can only charge a maximum rent of 0.6 percent of a house's value. So, a house worth $200,000 would have a total max rent-cap of $1,200 per month. Although this seems good for students, the problem is that most property owners will have to sell their homes because it is no longer profitable to rent them out. Fewer houses means that more students will have to move into the high-rise apartments around campus. Here's the catch…these high-rise apartments are not bound by the rent-cap law. Which means, after you are forced out of the neighborhoods, you will have to pay the higher rent prices in apartments like University View or Mazza Grandmarc. If the law is enforced, within a year the houses for rent in College Park could be non-existent. You wouldn't be able to rent affordably in College Park. For your own sake, oppose the law. Instead of an unconstitutional rent-cap law for College Park houses, landlords should be allowed to let the free-market govern rental prices for houses in the neighborhoods. That way, you will have the opportunity to get fair and competitive rents, not overinflated rents that high-rise apartments charge. Do you want to live in an expensive high-rise apartment compared to a cheaper and unique house in College Park? Of course not. For your own sake, oppose the law.

Message 3: Source benefit

Speech Title: Distributive Studies Requirement Unnecessary

I'm a Communication major. I declared before I even arrived on campus. I knew that I wanted to go into a communication-related field since my junior year of high school. So why does the university require Communication majors to take physics, biology, or chemistry? I have yet to hear a good answer to that question. I firmly believe that the distributive studies requirement should be removed from the general

education curriculum. As a sophomore, I still have to fulfill the distributive studies requirements, so this change definitely would help me. However, it's not hard to see that requiring students like me to take courses in unrelated areas to their majors is not beneficial. Do me a favor and call for the removal of distributive studies from general education. According to UMD's gen-ed website, the purpose of distributive studies are apparently to give students a "breadth of knowledge and disciplinary diversity" in order to "lead students to new perspectives and also challenge students to apply their new understandings." I don't know about you, but every person I've talked to who is not a Chem, Bio, or Physics major did not benefit from taking those classes. They can't apply their new understandings because they forget the stuff as soon as they take the final. And with good reason, since it doesn't' relate to their own interests and desired careers. In place of irrelevant distributive studies courses, I could take additional courses that aid in my mastery of my subject of choice. Maryland is not a liberal arts school, and it shouldn't force me to take unnecessary courses to make me a better citizen of the world. No, I go to college to gain expertise in a particular subject. I should not be required to take courses that do not contribute toward this expertise. I'm not saying courses in physics or philosophy are bad courses or shouldn't be offered. For those students who want a broad survey of different courses from a variety of subjects, they should have the freedom to elect to take these courses. But I want to specialize in my major and truly master that material. This not only keeps me more interested in my classes, but it increases my chances of finding the type of job I want upon graduation. It's not too late for me because I've not yet taken my distributive studies classes. For the benefit of my future education and employment, distributive studies requirements need to end.

Message 3: Target benefit

Speech Title: Distributive Studies Requirement Unnecessary

I'm a Communication major. I declared before I even arrived on campus. I knew that I wanted to go into a communication-related field since my junior year of high school. So why does the university require Communication majors to take physics, biology, or chemistry? I have yet to hear a good answer to that question. I firmly believe that the distributive studies requirement should be removed from the general education curriculum. As a sophomore, I've already fulfilled the distributive studies requirements, so this change definitely would not help me. However, it's not hard to see that requiring students like you to take courses in unrelated areas to their majors is not beneficial. Do yourself a favor and call for the removal of distributive studies from general education. According to UMD's gen-ed website, the purpose of distributive studies are apparently to give students a "breadth of knowledge and disciplinary diversity" in order to "lead students to new perspectives and also challenge students to apply their new understandings." I don't know about you, but every person I've talked to who is not a Chem, Bio, or Physics major did not benefit from taking those classes. They can't apply their new understandings because they forget the stuff as soon as they take the final. And with good reason, since it doesn't' relate to their own interests and desired careers. In place of irrelevant distributive studies courses, you could take additional courses that aid in your mastery of your subject of choice. Maryland is not a liberal arts school, and it shouldn't force you

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Experiment 3

Message 1: Source benefit

Speech Title: Legacy Scholarships are a Bad Idea

The Maryland Alumni Association engages in an unjust practice by offering some scholarships only to legacy students. Legacy students are those students who have relatives who graduated from UMD. I am not a legacy student, and I think this biased system of giving scholarships only to people who have alumni parents or grandparents needs to stop. Not being a legacy student myself, I would benefit from such a change. Such favoritism is not right. I should have the same right to scholarship money as legacy students. Take, for example, the Colonel J. Logan Schutz Scholarship. This scholarship is given to a UMD junior who is a full time student with a cumulative GPA of at least 3.0. In addition to these criteria, the scholarship is granted based on a student's extracurricular activities and answers to two questions: What can the Alumni Association better do to build the Terrapin Spirit with alumni and students? and, How do you plan to stay involved in Maryland after graduating? I could probably give great answers to these questions, but guess what? I wouldn't get the scholarship because I'm not a legacy student. I wouldn't even be considered for the sole reason that I wasn't born into a family with Maryland alumni. Is this caste system fair for people like me? The answer is no. I am currently finishing up my sophomore year, which means next year I'll be a junior and could apply for the Schutz Scholarship. Because I am not a legacy, I won't be applying. Scholarships like these should be awarded based on merit and the quality of the student's application, and not on the circumstances of their relatives. It's just not right to discriminate against students like me.

Message 1: Target benefit

Speech Title: Legacy Scholarships are a Bad Idea

The Maryland Alumni Association engages in an unjust practice by offering some scholarships only to legacy students. Legacy students are those students who have relatives who graduated from UMD. I am a legacy student, and I think this biased system of giving scholarships only to people who have alumni parents or grandparents needs to stop. Being a legacy student myself, I would not benefit from such a change. Such favoritism is not right. You should have the same right to

scholarship money as legacy students. Take, for example, the Colonel J. Logan Schutz Scholarship. This scholarship is given to a UMD junior who is a full time student with a cumulative GPA of at least 3.0. In addition to these criteria, the scholarship is granted based on a student's extracurricular activities and answers to two questions: What can the Alumni Association better do to build the Terrapin Spirit with alumni and students? and, How do you plan to stay involved in Maryland after graduating? You could probably give great answers to these questions, but guess what? You wouldn't get the scholarship if you're not a legacy student. You wouldn't even be considered for the sole reason that you weren't born into a family with Maryland alumni. Is this caste system fair for people like you? The answer is no. I am currently finishing up my sophomore year, which means next year I'll be a junior and could apply for the Schutz Scholarship. Even though I am a legacy, I won't be applying. Scholarships like these should be awarded based on merit and the quality of the student's application, and not on the circumstances of their relatives. It's just not right to discriminate against students like you.

Message 2: Source benefit

Speech Title: Try the Reusable To-Go Containers from Dining Services

Who wants a little extra cash lying around? I know I do. Dining services offers a new option since the Spring 2012 semester that allows people to use reusable to-go containers when carrying out meals. I have a meal plan, so the program can save me money while also giving the environment a break. To keep cash in your pocket, use the reusable to-go containers. It's easy. When eating to-go at the North Campus Dining Hall or the South Campus Dining Room, ask the server for a reusable to-go container called an Ozzi. The containers look like a typical styrofoam to-go container, except they are a made out of green plastic. Participation in the program costs a small one-time fee of 5 dollars, but it gives me a 25 cent discount every time you carryout with a reusable container after that. Given the amount I take-out from the dining halls, that's big savings for me. During the next visit, simply exchange the Ozzi container for a token that is used to get a new clean reusable to-go container for the next meal. This is seriously an easy way to save money over the course of the semester. Since I have a meal plan and eat nearly every meal in the dining halls, I personally profit from this great program. Saving money to use on other stuff is always a good thing. Not only does the program provide savings for me, but using a reusable container helps to reduce landfill waste and saves resources. I benefit, and so does the environment. It's that simple. Try an Ozzi.

Message 2: Target benefit

Speech Title: Try the Reusable To-Go Containers from Dining Services

Who wants a little extra cash lying around? I know you probably do. Dining services offers a new option since the Spring 2012 semester that allows people to use reusable to-go containers when carrying out meals. I no longer have a meal plan, but the program can save you money while also giving the environment a break. To keep cash in your pocket, use the reusable to-go containers. It's easy. When eating to-go at the North Campus Dining Hall or the South Campus Dining Room, ask the server for a reusable to-go container called an Ozzi. The containers look like a typical styrofoam

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Message 3: Source benefit

Speech Title: Free STI Testing at Health Center a Must

The University Health Center offers testing for sexually transmitted infections, including HIV, Syphilis, Gonorrhea and Chlamydia. This is a great service, but it is not enough. Tests for STIs and STDs at the Health Center should be free at all times. For people who have sex with multiple partners, this service is crucial. The typical sexually active college student is said to have between 1 and 5 partners during college, and I fit into this norm. Because the service might directly affect me, it's easy to see that I would be better off with free STI testing at the Health Center. For the sake of my and my partners' sexual health, offer free STI testing at the Health Center. It is no secret that STIs run rampant at college campuses, including UMD. The problem with STIs is that they are asymptomatic, meaning that no one knows for sure whether or not they are infected unless they are tested for STIs. A few times a semester, the Health Center will offer a day of free STI testing. Although this is a good thing, free testing needs to be all the time. I should not have to wait until a free testing day to know if I am infected, and neither should my partners. Many students will not want to pay for STI testing or get referred by a doctor so they can charge their insurance. Charged insurance also makes it more likely for mom and dad to find out. For the convenience of UMD students like me, free STI testing at the Health Center is necessary. Free STI testing should be made available for me at all times in the semester. Other health clinics in the area offer STI testing as a free service, and the university should too. For example, Prince George's County Health Department offers free STI testing, but it is in Cheverly, Maryland. Having to go all the way to Cheverly is too inconvenient for most students. Many students probably don't even know where Cheverly is. The idea is to make the service as convenient as possible. The Health Center offers these services. Now all they need to do it make them free. Not only would I want to know if you have an STI, but I'd want to know whether my sexual partners have STIs. Without a free testing service on campus, students getting tested just doesn't seem likely. Sexual health is a serious issue. For the welfare of my sexual health, ask for free year round STI testing on campus.

Message 3: Target benefit

Speech Title: Free STI Testing at Health Center a Must

The University Health Center offers testing for sexually transmitted infections, including HIV, Syphilis, Gonorrhea and Chlamydia. This is a great service, but it is not enough. Tests for STIs and STDs at the Health Center should be free at all times. For people who have sex with multiple partners, this service is crucial. I've been in a committed relationship for three years and am only sexually active with that person. Although the service might not directly affect me, it's easy to see that UMD students would be better off with free STI testing at the Health Center. For the sake of students' and their partners' sexual health, offer free STI testing at the Health Center. It is no secret that STIs run rampant at college campuses, including UMD. The problem with STIs is that they are asymptomatic, meaning that no one knows for sure whether or not they are infected unless they are tested for STIs. A few times a semester, the Health Center will offer a day of free STI testing. Although this is a good thing, free testing needs to be all the time. Students should not have to wait until a free testing day to know if they are infected, and neither should their partners. Many students will not want to pay for STI testing or get referred by a doctor so they can charge their insurance. Charged insurance also makes it more likely for mom and dad to find out. For the convenience of UMD students like you or your friends, free STI testing at the Health Center is necessary. Free STI testing should be made available for all students at all times in the semester. Other health clinics in the area offer STI testing as a free service, and the university should too. For example, Prince George's County Health Department offers free STI testing, but it is in Cheverly, Maryland. Having to go all the way to Cheverly is too inconvenient for most students. Many students probably don't even know where Cheverly is. The idea is to make the service as convenient as possible. The Health Center offers these services. Now all they need to do it make them free. Not only would you want to know if you have an STI, but you'd want to know whether your sexual partners have STIs. Without a free testing service on campus, students getting tested just doesn't seem likely. Sexual health is a serious issue. For the welfare of your and other's sexual health, ask for free year round STI testing on campus.

Experiment 4

Source benefit

Speech Title: Decrease Parking Permit Prices

Price of parking on campus for students is getting out of control. This academic year, it costs resident students who live on campus 438 dollars and commuters who live off campus 227 dollars for an annual parking pass. As you will see, there are a number of reasons this should be far cheaper. It is clear to me, as someone who drives my own car to campus every day, that parking permits are way too expensive. For my sake, demand lower parking costs. For one, parking on campus is inconvenient. It is tough to find a space even in my assigned lot. Just ask anyone who has had a parking permit for Lot 19 but can't find a spot because of all the construction that has eliminated about two hundred spots in the Mowatt Lane Garage on South Campus. Most of the lots require students to move their cars for sporting events so there will be space for fans to park. For someone who pays to have my car in that lot, it is ridiculous that I have to move it on gamedays. And if I don't, I have to pay hefty

parking fines on top of the permit fee that I already paid. Furthermore, other schools in the area don't even charge for student parking passes. For example, University of Maryland Baltimore County has free parking for students. That's right. Free parking! The parking costs are included in the mandatory transportation fee at UMBC. Not so at UMD. Not only do we have to pay a mandatory transportation fee, but I additionally have to pay an arm and a leg in order to park on campus. Getting the picture? The solution is obvious. Lower parking permit prices. I'm not saying that UMD parking has to be free like at other Maryland schools, but to charge resident students $438 and commuters $227 for subpar parking is too high. As a student with a parking pass…do it for me. On campus parking costs need to be reduced.

Target benefit

Speech Title: Decrease Parking Permit Prices

Price of parking on campus for students is getting out of control. This academic year, it costs resident students who live on campus 438 dollars and commuters who live off campus 227 dollars for an annual parking pass. As you will see, there are a number of reasons this should be far cheaper. It is clear to me, as someone who doesn't even have a car in College park and takes public transportation to campus every day, that parking permits are way too expensive. For your sake, demand lower parking costs. For one, parking on campus is inconvenient. It is tough to find a space even in your assigned lot. Just ask anyone who has had a parking permit for Lot 19 but can't find a spot because of all the construction that has eliminated about two hundred spots in the Mowatt Lane Garage on South Campus. Most of the lots require students to move their cars for sporting events so there will be space for fans to park. For someone who pays to have your car in that lot, it is ridiculous that you have to move it on gamedays. And if you don't, you have to pay hefty parking fines on top of the permit fee that you already paid. Furthermore, other schools in the area don't even charge for student parking passes. For example, University of Maryland Baltimore County has free parking for students. That's right. Free parking! The parking costs are included in the mandatory transportation fee at UMBC. Not so at UMD. Not only do we have to pay a mandatory transportation fee, but you additionally have to pay an arm and a leg in order to park on campus. Getting the picture? The solution is obvious. Lower parking permit prices. I'm not saying that UMD parking has to be free like at other Maryland schools, but to charge resident students $438 and commuters $227 for subpar parking is too high. As a student who doesn't even have a parking pass, don't do it for me…do it for you and your friends. On campus parking costs need to be reduced.

Appendix B: Directions

Why we are doing this study

The University of Maryland's Department of Communication is currently undergoing an assessment of student learning in Communication courses. We are interested in how students evaluate and understand other students' coursework. If students see things too differently from each other, it's difficult to facilitate an environment in which learning occurs. This project is designed to determine how you perceive other students' work in another Communication course at UMD.

Instructions for your participation

We would like you to read a few speeches completed by other undergraduate students enrolled in a Communication course at UMD. You will be asked to read short transcripts from a student's brief speech that he/she gave in an oral communication course. The assignment asked students to give a short speech (lasting between 2 and 3 minutes) about a UMD policy that they would like to see changed.

You will also be shown a photograph of the UMD student who gave each speech in order to better imagine yourself as an audience member. Because of privacy considerations, the name of the student who gave the speech will remain anonymous to you.

Please view the photograph of the student speaker and read the speech. Then, answer questions about the speech and speaker with your honest opinion. There are no wrong answers, and we are interested in what you think. We'll ask you to give your opinion on 3 randomly selected speeches.

Thanks again for your participation in this important project. We look forward to seeing your feedback about these students and their speeches.

Q11 Please click below once you have read the instructions and are ready to begin reading a student's brief speech about a UMD policy.

❍ I am ready to read the speeches. (1)

Appendix C: Questionnaire Item Stems

Now that you've read the speech, please rate your agreement with the following statements about the student who gave this speech.
The speaker is primarily concerned with his own well-being. (1)
The speaker cares about how he will benefit from this issue. (2)
The speaker will benefit if I do what he says. (3)
The speaker is concerned with his welfare. (4)
The speaker has my well-being in mind. (5)
The speaker cares about how I will benefit from this issue. (6)
I will benefit by doing what the speaker says. (7)
The speaker is concerned with my welfare. (8)
The speaker has the average UMD student's well-being in mind. (9)
The speaker cares about how the average UMD student will benefit from this issue. (10)
The average UMD student will benefit by doing what the speaker says. (11)
The speaker is concerned with the average UMD student's welfare. (12)
This person is friendly. (13)
This person is likeable. (14)
This person is warm. (15)
This person is approachable. (16)
I would ask this person for advice. (17)
I would like this person as a coworker. (18)
I would like this person as a roommate. (19)
I would like to be friends with this person. (20)
I think he could be a friend of mine. (21)
I would like to have a friendly chat with him. (22)
It would be difficult to meet and talk with him. (23)
He would fit into my circle of friends. (24)
He would be pleasant to be with. (25)
This person is handsome. (26)
This person is ugly. (27)
This person is attractive physically. (28)
I don't like the way he looks. (29)
He is not very good looking. (30)
He appears to be a typical goof off. (31)
You could count on him getting a job done. (32)
I have confidence in this person's ability to get a job done. (33)
If I wanted to get things done, I could probably depend on him. (34)
I couldn't get anything accomplished with him. (35)
He would be a good person to work with. (36)

On the scale below, indicate your feelings about this student speaker. The person who gave this speech seems:
Unintelligent:Intelligent (1)
Untrained:Trained (2)
Doesn't care about me:Cares about me (3)
Dishonest:Honest (4)
Doesn't have my interests at heart:Has my interests at heart (5)
Untrustworthy:Trustworthy (6)
Inexpert:Expert (7)
Not self-centered:Self-centered (8)
Not concerned with me:Concerned with me (9)
Dishonorable:Honorable (10)
Uninformed:Informed (11)
Immoral:Moral (12)
Incompetent:Competent (13)
Unethical:Ethical (14)
Insensitive:Sensitive (15)
Stupid:Bright (16)
Phony:Genuine (17)
Not understanding:Understanding (18)
Unlike me:Like me (19)
Different from me:Similar to me (20)
Not to think like me:To think like me (21)
Not to behave like me:To behave like me (22)

This message made me feel:
Determined (1)
Attentive (2)
Inspired (3)
Active (4)
Afraid (5)
Nervous (6)
Upset (7)
Ashamed (8)
Hostile (9)

Now we'd like to ask you a few more questions about the speech.
The topic of the speech is important to me. (1)
I am interested in the speech topic. (2)
The topic of the speech is relevant to my life. (3)
I care about the issues at hand in this speech. (4)
The message was compelling. (5)
The message was persuasive. (6)
The message was dumb. (7)
The message was weak. (8)
The message was convincing. (9)
The message won me over. (10)
The message swayed me. (11)
The message was well written. (12)
I could see a classmate giving a similar type speech. (13)
This kind of speech is what I would hear in a public speaking class. (14)
The speech is typical of something that would be given in a public speaking class. (15)
This kind of argument would be given in a student's speech. (16)
Realistically, this is the kind of speech I'd expect for this assignment. (17)

(Example stem for direct attitude measure) Resident students are charged $438 dollars to park on campus, and commuter students are charged $227 dollars to park on campus. The current prices for UMD parking permits are:
Bad:Good (1)
Wrong:Right (2)
Harmful:Beneficial (3)
Unfair:Fair (4)
Foolish:Wise (5)
Negative:Positive (6)
Unnecessary:Necessary (7)
Undesirable:Desirable (8)
Unfavorable:Favorable (9)

(Example items for indirect attitude measure) Now that you've read the speech, what is your opinion regarding the topic of the speech?
The current price of UMD parking permits is too high. (1)
The cost of UMD parking permits should be lowered. (2)
The cost of UMD parking permits is overly expensive. (3)
Reduction of UMD parking permit prices is necessary. (4)

What percentage grade would you give this student for his speech? Please indicate a grade between 0 and 100. _____

Demographic Items:

Now we'd like to ask you a few questions about yourself.
I try to surpass others' accomplishments. (1)
I try to outdo others. (2)
I am quick to correct others. (3)
I impose my will on others. (4)
I demand explanations from others. (5)
I want to control the conversation. (6)
I am not afraid of providing criticism. (7)
I challenge others' points of view. (8)
I lay down the law to others. (9)
I put people under pressure. (10)
I hate to seem pushy. (11)

What is your biological sex?
- ❍ Male (1)
- ❍ Female (2)

What is your age in years? Please enter a number below.

What is your year at the university?
- ❍ Freshman (1)
- ❍ Sophomore (2)
- ❍ Junior (3)
- ❍ Senior (4)
- ❍ Great than Senior (5)

Please specify your ethnicity.
- ❍ Hispanic or Latino (1)
- ❍ Not Hispanic or Latino (2)

Please specify your race.
- ❍ White (1)
- ❍ Black or African American (2)
- ❍ American Indian or Alaskan Native (3)
- ❍ Asian (4)
- ❍ Native Hawiian or other Pacific Islander (5)
- ❍ Other (6) _____

Appendix D: Debriefing Statement

(All)
The study you completed was purported to be about assessment of a student speech and speaker at the University of Maryland. This study was actually about how physical cues of persuasive sources affect their ability to persuade. We wanted to know whether students who read speeches responded differently to the speeches depending on characteristics of the source and their own biological characteristics.

(For Experiments 1, 2, and 3)
For those students who read speeches paired with photographs of the speakers, speaker faces varied in symmetry and masculinity for participants in different conditions. For those students who listened to a speech, the depth of the voice differed for participants in different conditions.

(For Experiment 4)
Participants were randomly assigned to one of two conditions in which the photograph of a speaker differed. Participants in one condition viewed a photograph that had 30% of their own face morphed into the speaker's face (that is real purpose for your photograph being taken prior to the online survey…there was actually no study about social media usage and no other people viewed your photographs). Participants in the other condition viewed a random photograph of another students' morph rather than their own morph. It was hypothesized that students would better like the speech and speaker who possessed similar facial characteristics to their own.

(All)
The speech(es) you reviewed were not actually UMD students' academic work (although they dealt with real UMD issues), and the speakers were not actually students at UMD. However, the researchers deemed it necessary for participants to believe this scenario so they would not be inclined to suspect the purpose of this study, which was to assess the effect of source characteristics on responses to a message.

This study was approved by the University of Maryland's Institutional Review Board. We appreciate your participation in this study. Much of what we have learned in the social sciences in the last century is due to the participation of students like you in various studies.

If you have questions or would like more information about this study, you may contact the principal investigator at:

[Contact information redacted]

Thank you for your participation.

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