

ALL TOUCHES ARE NOT CREATED EQUAL: EFFECTS OF FORM AND DURATION ON OBSERVERS' INTERPRETATIONS OF AN EMBRACE

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ABSTRACT: While several investigations have been directed at identifying the interpretations and perceptual outcomes of nonverbal behaviors, many have presented the stimulus behaviors in a static and unidimensional form that does not take into account the potential influences of their form, duration, or other dynamic features. The present experiment examined the effects of form and duration on observers' perceptions of, and attributions about, an embrace. One hundred sixty-four participants observed a videotape of two communicators enacting one of three forms of embrace for one of three durations. The results indicate that the egalitarianism of an embrace and its duration influence perceptions of its expectedness, its evaluation, how intimate it is interpreted to be, and what kind of relational attributions are made about the communicators.

Several investigations have elucidated the evaluations and interpretations invoked by nonverbal behaviors in interpersonal contexts (Bernieri, Gillis, David, & Grahe, 1996; Burgoon, 1991; Burgoon & Le Poire, 1999; Kenny, 1994). Many such studies have focused specifically on how nonverbal behaviors are assessed not by senders or receivers but by third-party observers. For instance, Derlega, Lewis, Harrison, Winstead, and Costanza (1989) showed participants a series of photographs depicting communicators hugging each other or putting their arms around each others' waists and assessed the extent to which they viewed the touches as normative. Similarly, Burgoon and Walther (1990) showed participants one of 56 photographs depicting several nonverbal behaviors and assessed participants' evaluations and interpretations of the behaviors.

Of importance in such studies has been the extent to which perceptual outcomes are resident in the behaviors themselves or are strongly influ-

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enced by the specifics of a given social context. While Heider's (1958) principle of meaning embeddedness posits the latter, a number of more recent studies have reported that particular nonverbal behaviors produce evaluative and perceptual outcomes that are relatively consistent across contexts, which is the principle behind a social meaning orientation to nonverbal behavior (Burgoon, 1994). For instance, Burgoon and Newton (1991) reported that nonparticipant observers showed consistency among themselves and with participants in their evaluation of nonverbal cue complexes associated with conversational involvement, a finding recently replicated by Burgoon and Le Poire (1999; see also Burgoon & Walther, 1990).

A potential shortcoming of this line of inquiry, however, is that experimental stimuli often portray nonverbal behaviors in a static and unidimensional form. To address the relational interpretations of a touch to the face, for example, Burgoon (1991) used one series of photographs (varying by communicator sex, physical attractiveness, and credibility) depicting one communicator touching another's face. In all instances, the form of the touch was the same, with the sender's open palm resting against the jawline of the recipient. Likewise, in Derlega et al. (1989), one type of hug was used in the stimulus photographs to assess how hugging is perceived.

Unaddressed in this methodology is how elements of the behaviors themselves can influence observers' perceptions. In the touch examples cited above, for instance, it is likely that differences in the *form* of the touch would translate into different interpretations. That is, a gentle caress to the cheek would certainly be expected to carry different connotations than an abrupt smack, yet both are touches to the face. Including only one form of a behavior as representative of that behavior (as in Burgoon, 1991, and Derlega et al., 1989), therefore masks what may be substantial within-behavior variance in the perceptual outcomes it invites. Moreover, a given touch might invoke different interpretations based on its *duration*. A brief, momentary hug, for instance, might be interpreted by observers as less intimate than a prolonged hug, even if the form of the behavior were the same. Unfortunately, such differences cannot be captured in still-photographic stimuli.

That the same behavior might produce varying interpretations based only on its form or its duration is not directly predicted by a social meaning orientation, but neither is it inconsistent with such a position. Because a social meaning model posits that perceptions and interpretations of nonverbal behaviors are largely resident in the behaviors themselves, as opposed to the context in which they occur, then it is not inconsistent to presume that variations on the same behavior will lead to differing outcomes just as

different behaviors would be expected to. The present experiment was designed to address the influences of form and duration on a given nonverbal behavior—in this case, the embrace—while the context is held constant. Although a number of nonverbal behaviors might lend themselves to such an investigation (e.g., gaze, face touching, kissing), the embrace was selected for this preliminary investigation not only because it can be delivered in several different forms and sustained for several different durations, but because it is a common behavior in a number of relationship types (e.g., romantic, familial, platonic) and is thus open to multiple interpretations. Specific hypotheses follow about the effects of form and duration on assessments of an embrace.

Hypotheses

As several investigations have found, observed nonverbal behaviors often invite inferences about the communicators and about their connection to each other. Such an outcome has repeatedly been demonstrated in research employing a social meaning orientation (e.g., Burgoon, Buller, Hale, & deTurck, 1984; Burgoon, Coker, & Coker, 1986; Burgoon, Manusov, Mineo, & Hale, 1985; Coker & Burgoon, 1987; Floyd, 1999). Particularly relevant to the present investigation is the common finding that hugging is associated with perceptions of intimacy and that it is more expected to be found in intimate than in casual relationships (Derlega et al., 1989; Floyd, 1997b; Floyd & Morman, 1997, 1998; Rabinowitz, 1991).

While this may be true generally, the present study proposes that perceptions of intimacy are heightened by particular features of an embrace. With respect to duration, it is expected that longer hugs are interpreted by observers as communicating greater intimacy than shorter hugs (H1a), since they involve prolonged body contact.

With respect to form, the forms of hugging addressed in this study are arrayed along a continuum of egalitarianism. Some embraces in interpersonal contact are highly egalitarian, in that neither communicator has more physical control over the other than his or her partner does. An example is what I refer to as a “criss-cross” hug, in which each person puts one arm over and one arm under the shoulder of the other. Other embraces are less egalitarian, in that one communicator is clearly more dominant or submissive than the other. The current study proposes that the egalitarianism of the hug affects observers’ perceptions of how intimate it is; however, the exact relationship is uncertain. On one hand, one might predict that more egalitarian hugs are perceived as more intimate since they might signify

strong relationships among people who consider themselves equals, such as in a romantic relationship. On the other hand, one might expect less egalitarian hugs to be perceived as more intimate, since they may indicate that one communicator is comfortable being made vulnerable to the other. Thus, this study advances a nondirectional hypothesis that embraces of differing egalitarianism differ in their perceived intimacy (H1b).

According to the Brunswikian lens model (Brunswik, 1956; see Bernieri et al., 1996), nonverbal behaviors lead not only to relational message interpretations of senders' behaviors, but also to basic assessments of senders' behaviors, such as how expected they are and how they are evaluated. I propose that the form of an embrace directly affects such assessments—specifically, that more egalitarian embraces are more expected and evaluated more favorably than less egalitarian embraces (H2). This prediction follows the reasoning that since egalitarianism and equality are generally valued in an individualistic culture, then behavior that is demonstrative of those qualities will be assessed accordingly. Moreover, I pose the question as to what effects, if any, duration has on evaluations and perceptions of expectedness (RQ).

In addition to considering the effects of form and duration on subjective judgments of evaluation and expectedness, one cannot dismiss the potential for biological sex to influence such judgments. Research on nonverbal behavior generally and affectionate behavior specifically (e.g., Floyd, 1997a, b; Floyd & Morman, 1997; Morman & Floyd, 1998) has demonstrated that different expectancies often apply to the behaviors of male and female communicators and that such differences translate into differing perceptions of the behavior. Of specific interest is the repeated finding that women are afforded greater freedom to express affection to each other than are men (e.g., Floyd, 1997a). As a result, I predict that the biological sex of the communicators exerts its own unique effects, such that embraces are more expected and more positively evaluated when enacted by women than by men (H3).

Of final interest in the present study is the issue of relational attributions. This refers to the type of relationship that observers attribute to communicators. Some investigations have manipulated such attributions. In an earlier study of observers' reactions to touch, Floyd (in press) told some participants that the communicators in the stimulus photographs were platonic friends and other that they were family members. As hypothesized, he found that observers evaluated several touches more favorably when they believed the communicators were related. Moreover, several differences in perceptions of touch based on communicator sex that were large when observers believed the communicators were friends were attenuated

or eliminated when observers believed the communicators were family members.

Floyd suggested that observers who are uncomfortable with the implications of certain touches (e.g., seeing two men kiss each other) may formulate relational attributions that attenuate their discomfort (e.g., deciding that the two men are probably related). To address this, relational attribution is a dependent variable rather than a manipulation in the present experiment. The specific predictions were that shorter and more egalitarian hugs are likely to produce a platonic friendship attribution (H4), while longer and less egalitarian hugs produce nonplatonic attributions, such as that the communicators are family members and/or that they have a romantic interest in each other (H5).

Method

Participants

Participants were 164 adults (65% female) recruited from introductory communication courses at a large university in the southwest. Participants ranged in age from 18 to 44 years ($M = 22.31$ years, $SD = 4.82$), were predominantly white (90%), and were self-identified as exclusively heterosexual. Most participants (150) were single at the time of the study, while ten were married and four were separated or divorced. Participation was voluntary and earned extra course credit.

Procedure

Participants were recruited to take part in a short study on first impressions. The experiment took place in a large conference room equipped with several TV/VCR stations. Upon arrival, participants were told they would be watching a short video segment of two people interacting and would be asked to "think about the impressions you form of the people in this interaction." After consenting to participate, participants were seated at a station equipped with a television monitor and a VCR, and watched a short video segment. Afterward, they responded to a series of Likert-type statements regarding their impressions of the interaction they observed. They were then asked to provide demographic and self-descriptive information, were informed of the purpose of the study, and were thanked for their participation.

Experimental Stimuli and Manipulations

Each participant watched one of 18 videotaped interactions. The video segments depicted two individuals walking toward each other, embracing, and then walking away. The individuals in the video segments (hereafter referred to as the communicators) were videotaped from the side at approximately 20 feet from the camera. In each segment, one communicator entered the scene from the left and the other from the right. They met in the middle of the camera's view, embraced, then walked together toward the camera and out of the scene to the left. In each scene, the communicators were talking but not touching each other as they exited the scene. Each participant watched only one video segment. To focus attention on communicators' nonverbal behaviors and to prevent their verbal behaviors from confounding participants' impressions, the video segments were presented without sound.

The communicators were actors who were Caucasians in their mid-20s, similar to the modal participant. To allow participants to plausibly conclude that the communicators might be family members as well as friends or romantic partners, each communicator was paired with another of similar build, appearance, and hair color. The independent variable of *communicator sex* was manipulated by having participants view a video segment of either two males ($n = 70$) or two females ($n = 94$).

Duration of embrace was manipulated by having communicators embrace for either one second, three seconds, or five seconds. To ensure that the hugs lasted the appropriate amount of time, a research assistant standing outside the view of the camera timed the hugs with a stopwatch and verbally indicated to the communicators when they should start and stop hugging. Participants were roughly equally exposed to video segments of the one-second ($n = 58$), three-second ($n = 54$) and five-second ($n = 50$) hugs.

Form of embrace was manipulated by having communicators enact one of three different types of hug. The "criss-cross" hug was enacted by having each communicator put one arm over and one arm under the shoulder of the other, with the majority of each communicator's chest and trunk touching the other's ($n = 64$). The "neck/waist" hug was enacted by having one communicator lock her arms around the neck of the other, and the other communicator lock her arms around the waist of the other, with the majority of each communicator's chest and trunk touching the other's ($n = 56$). Finally, the "engulfing" hug was enacted by having one communicator fold his arms over his own chest, while the other locks his arms entirely around the other. In this embrace, the first communicator's arms

are sandwiched between the two chests and his head rests sideways on the shoulder of the other ($n = 44$).

Measures

Intimacy was measured with the intimacy subscale of Burgoon and Hale's (1987) Relational Themes Questionnaire ($\alpha = .68$). *Expectedness* and *evaluation* were assessed with eight 7-point Likert-type items developed by Burgoon, Newton, Walther, and Baesler (1989).¹ Four items each assess how expected the communicator's behavior was ($\alpha = .80$) and how positively the behavior was evaluated ($\alpha = .78$). *Attributions about relationship type* were measured with three pairs of Likert-type items developed for this study. Two items addressed the likelihood that the communicators were platonic friends ($\alpha = .88$); two items measured the likelihood that the communicators were family members ($\alpha = .85$); and two items assessed the likelihood that the communicators had romantic interests in each other ($\alpha = .90$).²

Results

Manipulation Checks

To ensure that participants saw the criss-cross hug as the most egalitarian, followed by the neck/waist hug and then by the engulfing hug, I had participants complete the equality subscale of the Relational Themes Questionnaire (Burgoon & Hale, 1987). The two-item scale assesses the extent to which participants believe the communicators see themselves as equals, based on their behavior.³ Coefficient alpha for the subscale was .80. The three hugs differed significantly from each other, $F(2, 163) = 18.81$, $p < .01$, $\eta^2 = .19$. Planned, single-*df* contrasts revealed that the criss-cross hug ($M = 6.31$, $SD = .74$) conveyed more equality than the neck/waist hug ($M = 5.57$, $SD = 1.20$), $t(161) = 3.10$, $p = .001$; and that the neck/waist hug conveyed more equality than the engulfing hug ($M = 4.75$, $SD = 1.93$), $t(161) = 3.12$, $p = .001$.

Because nonverbal behavior involves multiple channels, the effect of the manipulated behavior can potentially be moderated by other nonverbal behaviors in which the communicators engaged. To rule out other, non-manipulated behaviors as confounds, the following behaviors were coded for both communicators in each video segment: gaze, speed of approach, pleasantness of facial expression, smiling, use of self-adaptors, and presence of other, nonmanipulated touch. The behaviors were coded on seven-

point scales wherein higher scores indicate greater frequency or intensity of the behavior, and scores were compared in $2 \times 3 \times 3$ factorial ANOVAs with communicator sex, form of embrace, and duration of embrace as the independent variables. None of the independent variables, alone or in combination, exerted a significant effect on any of the coded behaviors, which argues for excluding them as covariates in the hypothesis tests.⁴

Intimacy

The first hypothesis predicted that form and duration would exert main effects on ratings of intimacy, such that longer hugs are considered more intimate than shorter hugs and that the forms differ in their ratings of intimacy. Intimacy was analyzed in a 3 (form of embrace) \times 3 (duration of embrace) \times 2 (sex of communicators) analysis of variance.⁵ Sex of communicators was included as an independent variable to allow for examination of its potential interactions with form and/or duration. The ANOVA produced a main effect for form, $F(2, 162) = 5.94, p = .003, \eta^2 = .08$, as well as a three-way interaction, $F(4, 162) = 6.39, p < .001, \eta^2 = .15$. The means for the three-way interaction, which are provided in Table 1, manifest a complex pattern in which the criss-cross hug is generally considered the most intimate, followed by the neck/waist hug and then by the engulfing hug. However, within male-male and female-female conditions, there is considerable variation in the intimacy ratings as a function of duration. For males, the most intimate criss-cross and engulfing hugs are at five seconds, while the most intimate neck/waist hug was at three seconds. For females, the criss-cross hug was most intimate at one second, the neck/waist hug at three seconds, and the engulfing hug at five seconds. Moreover, the most intimate and least intimate hugs in the entire sample were both between females for three seconds. Thus, although the means provide support for hypothesis 1a, the substantial variation in the effect of duration precludes support for hypothesis 1b. The first hypothesis was therefore partially supported.

Expectedness and Evaluation

The second hypothesis predicted a main effect for form on expectedness and evaluation, such that embraces are less expected and less favorably evaluated as they become less egalitarian. The third hypothesis suggested a main effect for communicator sex, such that the embraces are more expected and evaluated more positively when engaged in by women than by men. The research question asked what effect, if any, duration exerts on judgments of expectedness and evaluation. Expectation and eval-

TABLE 1
Means and Standard Deviations for Form by Duration by Communicator Sex Interaction on Ratings of Intimacy

Effect	Male-Male Touch	Sig. Differences with Other Conditions	Female-Female Touch	Sig. Differences with Other Conditions
Criss-Cross				
1 Second	5.04a (0.89)	k, q	5.12j (0.84)	b, k, q
3 Seconds	4.42b (1.36)	c, d, j, k, l, o	5.95k (0.72)	a, b, d, f, g, h, i, j, m, n, q, r
5 Seconds	5.71c (0.60)	b, d, f, g, m, n, q, r	5.33l (0.70)	b, g, m, q, r
Neck/Waist				
1 Second	4.63d (0.71)	b, c, k	4.69m (0.60)	c, k, l
3 Seconds	5.25e (0.57)	g, q	4.93n (1.11)	c, k, q
5 Seconds	4.67f (0.91)	c, k	5.38o (0.54)	b, g, q, r
Engulfing				
1 Second	4.42g (1.46)	c, e, k, l, o	4.96p (0.68)	q
3 Seconds	5.04h (1.27)	k, q	4.08q (0.60)	a, c, e, h, i, j, k, l, n, o, p
5 Seconds	5.13i (0.62)	k, q	4.46r (0.58)	c, k, l, o

Notes. Standard deviations are in parentheses. Per Bonferroni test, each mean differs significantly ($p < .05$) from those means whose subscripts are designated.

uation, $r(162) = .61, p < .001$, were assessed in a three-way multivariate analysis of variance with form, duration, and communicator sex as the independent variables. The MANOVA produced significant multivariate effects for form, $\Lambda = .90, F(4, 298) = 4.14, p = .003, R^2 = .05$; duration, $\Lambda = .92, F(4, 300) = 3.08, p = .016, R^2 = .04$; communicator sex, $\Lambda = .94, F(2, 149) = 4.59, p = .012, R^2 = .06$; and the three-way interaction, $\Lambda = .72, F(24, 298) = 2.25, p = .001, R^2 = .15$.

As predicted by the second hypothesis, form produced a significant

univariate main effect on evaluation, $F(2, 168) = 8.35, p < .001, \eta^2 = .10$. The criss-cross hug was evaluated most positively ($M = 5.74, SD = 1.01$), followed by the neck/waist hug ($M = 5.44, SD = .98$) and then the engulfing hug ($M = 4.88, SD = 1.46$). Planned, single-*df* contrasts indicated that evaluation of the criss-cross hug was not significantly more positive than that of the neck/waist hug, $t(161) = 1.24, p = .108$; however, the neck/waist hug was evaluated significantly more positively than the engulfing hug, $t(161) = 2.75, p = .004$. These results provide qualified support for the first part of the hypothesis. Contrary to the prediction, however, the univariate effect for expectedness was nonsignificant, $F(2, 168) = 1.41, p = .247, \text{power} = .30$. Hypothesis two is partially supported.

With respect to the third hypothesis, communicator sex exerted a significant univariate effect on expectedness, $F(1, 168) = 7.45, p = .007, \eta^2 = .05$. The means reveal that embraces observed between women were judged as more expected ($M = 5.14, SD = 1.17$) than were those observed between men ($M = 4.59, SD = .46$). Contrary to the hypothesis, however, the univariate effect for evaluation was nonsignificant, $F(1, 168) = 0.12, p = .732, \text{power} = .06$. The third hypothesis is supported with respect to expectedness.

To address the research question, univariate effects of duration were examined. Duration produced a significant main effect on evaluation, $F(2, 168) = 4.38, p = .014, \eta^2 = .06$. Mean scores indicated that the one-second hug was most positively evaluated ($M = 5.66, SD = 1.05$), followed by the five-second hug ($M = 5.37, SD = 1.06$) and then by the three-second hug ($M = 5.14, SD = 1.38$). Post-hoc analysis revealed that the one-second and three-second hugs differed significantly from each other while neither differed significantly from the five-second hug.

Duration also produced a significant main effect on expectedness, $F(2, 168) = 5.31, p = .006, \eta^2 = .07$. Means were in the same pattern as for evaluation: the one-second hug was most expected ($M = 5.25, SD = 1.18$), followed by the five-second hug ($M = 4.38, SD = 1.41$) and then by the three-second hug ($M = 4.56, SD = 1.33$). Post-hoc analysis again revealed that the one-second and three-second hugs differed significantly from each other while neither differed significantly from the five-second hug.

Relationship Attributions

The fourth hypothesis predicted that communicators enacting shorter and more egalitarian hugs are more likely to be seen as platonic friends

than communicators enacting longer and less egalitarian hugs. The fifth hypothesis predicted that communicators enacting longer and less egalitarian hugs are more likely to be seen as family members and more likely to be seen as romantic partners than communicators enacting shorter and more egalitarian hugs. Due to their conceptual orthogonality and lack of multicollinearity, the three relationship-type attribution measures were analyzed in separate three-way ANOVAs, with form, duration, and communicator sex as the independent variables.

The friend attribution measure produced a significant main effect for form, $F(2, 161) = 4.20, p = .017, \eta^2 = .06$; as well as a form-by-duration interaction, $F(4, 161) = 2.79, p = .029, \eta^2 = .07$. Means for the interaction, provided in Table 2, indicate that the friend attribution was more likely for the more egalitarian than less egalitarian hugs, and for the shorter than the longer hugs. The fourth hypothesis is supported.

The romantic attribution measure produced main effects for form, $F(2, 161) = 4.81, p = .01, \eta^2 = .06$; and for communicator sex, $F(1, 161) = 4.65, p = .033, \eta^2 = .03$. As predicted, the criss-cross hug was seen as least likely to represent a romantic relationship ($M = 2.02, SD = 1.46$); however, contrary to the prediction, the neck/waist hug was seen as most likely to represent a romantic relationship ($M = 2.98, SD = 1.94$), followed by the engulfing hug ($M = 2.43, SD = 1.17$). Moreover, participants saw the male communicators as more likely to have romantic inclinations toward each other ($M = 2.79, SD = 1.71$) than the female communicators ($M = 2.20, SD = 1.52$). Duration did not produce a main or interaction effect on the romantic attribution.

The family attribution measure produced a form-by-duration interaction, $F(4, 161) = 3.58, p = .008, \eta^2 = .09$; a form-by-communicator sex

TABLE 2

Means and Standard Deviations for Form by Duration Interaction on Friend Attribution

	Criss-Cross	Neck/Waist	Engulfing
One Second	6.50 (1.44) _a	5.82 (1.79) _b	5.07 (1.45) _b
Three Seconds	5.95 (1.50) _b	5.31 (1.14) _b	5.19 (1.00) _b
Five Seconds	5.80 (1.74) _b	5.50 (1.57) _b	4.43 (.90) _c

Note. Standard deviations are in parentheses. Means with different subscripts differ from each other at $p < .05$ or less, per Bonferroni test.

TABLE 3

Means and Standard Deviations for Form by Duration, Form by Communicator Sex, and Duration by Communicator Sex Interactions on Family Attribution

	Criss-Cross	Neck/Waist	Engulfing
One Second	2.14 (1.07) _a	1.95 (.63) _{a, c}	3.07 (1.63) _b
Three Seconds	2.59 (1.32)	2.31 (1.31)	2.56 (1.08)
Five Seconds	2.90 (1.19) _b	2.50 (1.10)	1.79 (1.46) _{a, c}
Male Communicators	2.00 (0.91) _{a, c}	2.33 (1.15)	2.82 (1.68) _b
Female Communicators	2.85 (1.28) _b	2.13 (0.89) _c	2.14 (1.14) _c
	<i>One Second</i>	<i>Three Seconds</i>	<i>Five Seconds</i>
Male Communicators	2.63 (1.37)	2.50 (1.34)	1.95 (1.12) _a
Female Communicators	2.06 (0.97) _a	2.50 (1.17)	2.86 (1.31) _b

Note. Standard deviations are in parentheses. Within each block, means with different subscripts differ from each other at $p < .05$ or less, per Bonferroni test.

interaction, $F(2, 161) = 5.60$, $p = .005$, $\eta^2 = .07$; and a duration-by-communicator sex interaction, $F(2, 161) = 5.84$, $p = .004$, $\eta^2 = .08$. The means for the three interactions are provided in Table 3.

The means reveal several patterns relevant to the fifth hypothesis. Most notably, form and duration appear to exert opposite effects on perceptions of a familial relationship for those who observed male and female communicators. In the male-male condition, the communicators were seen as increasingly likely to be related as the hugs became less egalitarian (in support of the prediction), but decreasingly likely to be related as the hugs became longer (contrary to the prediction). In the female-female condition, the communicators were seen as decreasingly likely to be related as the hugs became less egalitarian (contrary to the prediction), but increasingly likely to be related as the hugs became longer (in support of the prediction). Moreover, the criss-cross and neck/waist hugs were seen as increasingly likely to represent familial relationships as duration increased (as predicted), but the engulfing hug was seen as increasingly likely to represent familial relationships as duration decreased. Hypothesis five is partially supported.

Discussion

The predictions received qualified support. With respect to interpreting the intimacy of the behavior, participants' responses were subject to a disordinal three-way interaction between form, duration, and communicator sex. As several other investigations have also reported (e.g., Burgoon & Walther, 1990), participants made differing interpretations of the same behaviors based on whether the behaviors were enacted by two men or by two women. Those who observed the men saw them as communicating the most intimacy with the criss-cross hug when it was enacted for either one or five seconds, but the least intimacy with the criss-cross hug when enacted for three seconds. Quite a different pattern emerged for those who observed the women: at one second, the most intimate hug was the engulfing hug; at three seconds, it was the criss-cross hug; and at five seconds, it was the neck/waist hug. Duration did not exert a main effect but its hypothesized influence on perceptions of intimacy was evident in several mean patterns within the three-way interaction.

These results obviously do not evidence the straightforward main effects hypothesized for duration and form. Indeed, the complexity of the three-way interaction defies a simple interpretation. It appears not only that perceptions of the intimacy of an embrace are affected by the unique, non-additive combination of form and duration, but that the patterns of those effects, as well as their absolute values, are influenced by the sex of the communicators. While this unhypothesized interaction merits replication before more developed conclusions are drawn, it does speak to the power of form and duration to influence how a touch is interpreted. Those observing the male communicators, for example, saw the criss-cross hug as the most intimate when enacted for one second, but when the communicators hugged for only two seconds longer, the criss-cross hug was considered the least intimate of the three. If nothing more, this complex interaction speaks to the worthiness of duration and form as subjects of further empirical attention.

All three manipulations—form, duration, and communicator sex—influenced perceptions of how expected the embrace was and how favorably it was evaluated. As predicted, the hugs were evaluated more positively the more egalitarian they were. Duration exerted U-shaped curvilinear effects whereby the one-second and five-second hugs were the most expected and most favorably evaluated, while the three-second hugs were least expected and least positively evaluated. These findings have direct implications for studies that examine relational message interpretations of touch or other nonverbal behaviors. Specifically, without attention to the form and dura-

tion of the behaviors under examination, particular interpretations (for instance, that a communicator is behaving inappropriately) may be made more salient while others may be made less plausible.

Of course, the embrace is likely not the only nonverbal behavior whose interpretations should be affected by duration and form. A touch to the face, for example, might consist of a caress to the cheek, a squeeze of the chin, or a punch to the jaw, each of which is likely to send a different relational message to the receiver and to observers. Likewise, these differences in form likely interact with other dynamic features of the touch, including its form and perhaps its intensity. A punch to the jaw, for instance, would probably send an aggressive message if it were done quickly and with much force, while the same touch done more slowly and less forcefully may communicate a playful, affectionate message. These subtle differences in the properties of a touch, therefore, can translate to large differences in how the touch is interpreted, a point that can assist researchers in formulating experimental stimuli in future studies of nonverbal behavior.

The embraces, regardless of their form or duration, were judged as more expected when they were enacted by women than by men. This finding contributes to a growing literature suggesting that, for North Americans, overt expressions of affection are considered more appropriate between women or in heterosexual pairs than between men (e.g., Floyd, 1997a, b; Floyd & Morman, 1997, 1998; Morman & Floyd, 1998). As Floyd (1997b) and Floyd and Morman (1997) reported, this is particularly true when the nature of the relationship between interactants is ambiguous. The hypothesized main effect on evaluation did not achieve significance, most likely due to its extremely low power. Given the often substantial correlation between evaluations and perceptions of expectedness, this test should be replicated with a larger sample.

Finally, while some other investigations have manipulated the type of relationship attributed to communicators in order to ascertain its effects on observers' perceptions (e.g., Floyd, *in press*), the present study examined what attributions observers made about communicators and how such judgments were influenced by the form and duration of their embrace. It was hypothesized that shorter and more egalitarian hugs would lead to attributions of platonic friendship, while longer and less egalitarian hugs would lead observers to conclude that the communicators were family members or had a sexual interest in each other. While the hypothesis regarding friendship attributions was supported, the data on the romantic attribution revealed that communicators enacting the neck/waist hug were actually seen as the most likely to have a sexual interest in each other, rather than those enacting the engulfing hug. One potential explanation for

this unpredicted finding is that, because of its form, the engulfing hug may be more indicative of a caretaking or protective relationship, such as between a parent and child, than it is of a sexual relationship. It is important to note, however, that although the three forms produced different means on the romantic attribution measure, the means were all extremely low, the highest being 2.98 on a 7-point scale. This indicates that while certain hugs were seen as more likely than others to indicate a sexual relationship, none was deemed likely, in an absolute sense, to indicate such a relationship. Given sociocultural sanctions against homosexuality (i.e., homophobia), participants may have been reluctant to make such an attribution about the communicators, especially since the communicators were of the same age, ethnicity, and demographic make-up as the modal participant.

Support for the family relationship attribution was mixed, evidencing complementary patterns for male and female communicators. Less egalitarian hugs were seen as more indicative of a familial relationship for male communicators, but as less indicative of a familial relationship for females. Similarly, female communicators were judged as more likely to be related the longer they embraced, while males were seen as more likely to be related the shorter they embraced. The net result, therefore, is that half of the prediction was supported for male communicators and the other half was supported for females. These results attest to the influence of biological sex as a moderator for expectations surrounding affectionate interpersonal behavior. The present findings are limited in this respect, however, because the stimulus videotapes portrayed only same-sex pairs. Thus, it is impossible to know whether to attribute the patterns to the sex of the initiator or the touch, the sex of the recipient, or to their unique combination. Replicating these relationship attribution findings with stimuli that include both same- and opposite-sex pairs can allow researchers to flesh out further the influences of sex on how individuals respond to observed nonverbal behavior.

Considered in concert, the present findings suggest that particular aspects of touch, such as its form and its duration, can influence how it is interpreted, how it is evaluated, and what kind of relational attributions it invokes. The most direct methodological implication of these results is that such effects are missed in studies that consider only the presence or absence of touch or that attend only to its frequency. Within such studies, some variance in evaluations or interpretations may be resident in form or duration, but such variance will not be accounted for. This is important not only for researchers designing future studies on interpretations of touch, but also for consumers in interpreting previous work.

The present findings are limited to the touch examined—in this case,

the embrace. However, as noted, form and duration may also influence perceptions of other touches, such as touches to the face, or even to other nonverbal behaviors. Gaze, for instance, may invite different evaluations and interpretations based on its duration and even on its form (e.g., whether direct or indirect eye gaze, whether accompanied by upraised or furled eyebrows, etc.). Moreover, form and duration are not the only aspects of touch that likely influence its interpretations; rather, as noted, perceptions may also vary based on the intensity of the touch. These topics provide a number of avenues for future research in this area.

Notes

1. Normalcy items included: "This person behaved in an unusual way" (reversed), "This person engaged in normal conversational behavior," "This person behaved the way you would expect most people to behave," and "This person acted in an appropriate manner during the conversation." Evaluation items included: "This person acted like someone that most people would like to interact with," "This person behaved in a way that was pleasing to the other person," "This person behaved in an undesirable fashion" (reversed), and "This person made the interaction enjoyable for the other person."
2. Family attribution items were: "The people in the video are probably related to each other," and "The people in the video are most likely not family members" (reversed). Friendship attribution items were: "The people in the video are probably platonic (nonromantic) friends," and "The people in the video acted as if they were friends rather than romantic partners." Romantic attribution items were: "The people in the video probably did not want to have a sexual relationship with each other" (reversed), and "The people in the video seemed as if they had a romantic interest in each other."
3. The items were: "The people in this video considered themselves to be equals," and "The people in this video didn't treat each other as equals" (reversed).
4. F-test results, means, and standard deviations are available from the author.
5. In this and the remaining ANOVA models, participant sex was initially included as a fourth factor. Because it consistently failed to produce main or interaction effects, however, it was removed and the three-way analyses were used.

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