Reactance to Healthy Eating and Physical Activity Messages: Face Threat and Face Management Strategies in Memorable Daily Conversations Among Couples

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Abstract

Most adults in the United States (U.S.) fail to meet guidelines for physical activity and nutrition outlined by the Centers for Disease Control. One important predictor of engagement in healthy behavior is support from one's romantic partner. However, messages from partners may fail to motivate healthy behavior if they threaten recipients' face and cause reactance. The present study examines face-threatening acts (FTAs) and face management strategies (FMSs) in conversations between romantic couples and their associations with reactance, healthy eating, and physical activity behaviors. Cohabitating couples (N = 70) were recruited, and one member of the couple completed a 10-day diary survey in which they reported on daily memorable conversations they had with their partner about physical activity and/or healthy eating. Participants completed measures of positive and negative face threat, as well as the extent to which they engaged in healthy eating and physical activity that day. Trained raters assessed reported conversations for positive and negative face threat as well as positive and negative FMSs. Results indicate that both participant and trained raters' reports of positive face threat were associated with increased reactance, whereas only participants' reports of negative face threat were associated with increased reactance. Both positive and negative FMSs were associated with reduced reactance. Reactance was negatively associated with healthy eating and physical activity. Results are discussed in terms of implications for reactance and politeness theories, as well as pragmatic implications for the millions of partnered individuals in the United States seeking to improve their health.

Keywords: reactance, face threat, face management, health, romantic relationships, politeness theory

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Poor diet and physical inactivity are linked to myriad negative health outcomes including, for example, cardiovascular disease, depression, poor cognitive functioning, and cancer (e.g., Cunningham et al., 2020; Mokdad et al., 2004; Keeney, 2008). However, few citizens adhere to recommended healthcare regimens to reduce these risks: over 80% of U.S. adults fail to consistently meet dietary guidelines; and sedentary lifestyles have a prevalence of about 25% across the U.S. (Carlson et al., 2018; Krebs-Smith et al., 2010; Owen et al., 2010). Behavior change messages from romantic partners play a critical role in motivating the enactment of healthy eating and physical activity behavior. However, if face threatening, these messages may create reactance and be counterproductive to healthy behavior change. Discussing health topics is sensitive and has multiple potential identity implications. Health is connected to individuals' sense of self and identity (see Fox & Ward, 2008), and discussing topics such as weight management and health history are often face threatening because conversations can be emotional, divisive, insulting, and/or perceived as critical (Brown & Levinson, 1987).

This paper examines ongoing interactions regarding healthy eating and physical activity behaviors captured by daily diary reports of memorable conversations. Participants' perceptions of memorable messages as well as researchers' ratings of those messages offer a robust measure of face threat and face management strategies (FMSs). The aim of this study is to understand messages from partners regarding healthy eating and physical activity are associated with face threat, FMSs, reactance, and healthy behavior outcomes. Below, politeness theory and the concepts of face threat and FMSs are reviewed followed by a discussion of how face threat and

FMSs may increase or decrease the experience of psychological reactance in response to a romantic partners' attempts to talk about healthy eating and/or physical activity.

Healthy Eating and Physical Activity Behavior Change Conversations

Intimate partners are a key source of messages about engaging in healthy eating and physical activity behaviors. Receiving more social support from intimate partners is associated with greater mental and physical health (Holt-Lunstad, Smith, & Layton, 2010). Beyond social support, intimate partners influence each other by sharing health goals and pushing one another to adopt new goals, like eating nutritiously (August & Sorkin, 2010). The content of these partner conversations about healthy eating and physical activity goals matters greatly; a meta-analysis examining partners' health-related influence attempts demonstrates that partners' message type consistently moderates health outcomes (Craddock, vanDellen, Novak, & Ranby, 2015). Intimate partners, but more specifically, the conversations between partners, are therefore a unique source of potential influence regarding decision-making, attitudes, and efficacy around healthy eating and physical activity (e.g., Ata et al., 2007; Dailey, Richards, & Romo, 2010; Worobey, 2002).

However, efforts to influence a partner's health behavior often backfire (e.g., Miller et al., 2007). Conversations meant to encourage healthier eating or increased physical activity may come across as imposing or preachy and may influence receivers to eat less healthfully or decrease their physical activity. Telling an intimate partner, "Wow, you really need to start exercising more! You need to go on a diet too," is likely to offend and anger rather than encourage. Crafting influential messages that increase positive health behaviors requires partners to minimize threatening or critical language and maximize supportive or polite language to a partner's *face.*

Politeness Theory: Face Threat and Face Management

Face refers to the "public self-image that every member wants to claim" (Brown & Levinson, 1987, p. 61). Politeness theory (Brown & Levinson, 1987) identifies two components of face. *Positive face* refers to the desire that one's self-image be appreciated and approved of by others, whereas *negative face* is the desire that one's actions be unimpeded by others and that one be free of imposition. According to politeness theory, both positive and negative face may be threatened by others during interaction. A positive face-threatening act (FTA) involves behavior that indicates that the speaker is indifferent to or negatively evaluates the receiver's positive face. Examples of positive FTAs include expressions of disapproval, criticism, and violent emotion; disagreements; and blatant non-cooperation. A negative FTA involves behavior that impinges upon or ignores the receiver's desire for autonomy. Acts that may threaten negative face include direct requests, demands, and assumptions about the receiver's wants and needs.

In part, politeness theory focuses on how message features relate to the experience of face threat. Though the most straightforward approach for a partner to deliver a behavior-change message is to be direct (e.g., "You're not eating well – you need to eat more vegetables"), such an approach could threaten face by impinging on the receiver's freedom to choose what to eat (negative face threat) and by criticizing the receiver's eating behavior (positive face threat). However, politeness theory offers strategies for crafting messages that promote behavior change while maintaining (i.e., not threatening) recipients' face. Two strategies of particular interest to the present study are *positive FMSs* and *negative FMSs.*

In general, FMSs are messages used to protect, restore, and otherwise manage face (e.g., Knobloch et al., 2010; Kunkel et al., 2003). We define *positive FMSs* as the communication of a positive evaluation of the recipient; care for the recipient; and/or validation of the recipient's

attitudes, feelings, and desires. Positive FMSs may be apparent in messages such as compliments (e.g., "You've been doing a great job incorporating more veggies into your diet"), showing solidarity and/or liking (e.g., "We're in this together;" "I love you"), and validating the recipients' values (e.g., "I can see it's important to you that we buy more veggies"). *Negative FMSs* involve giving others choice and supporting their self-efficacy (Deci et al., 2001). Negative FMSs may be communicated by being indirect (e.g., "Sally told me she's felt much better since she started eating more veggies"), using hedging language (e.g., "Maybe you could try more veggies?"), and/or offering options to the receiver (e.g., "Do you think we should have broccoli or cauliflower tonight?").

Reactance

Both positive and negative face threat may lead to reactance. The construct of reactance is useful for understanding the consequences of FTAs in couples' communication about health behaviors like eating and physical activity. Reactance is a motivational state that results from communicated threats to freedom and is comprised of negative emotions and cognitions (Brehm & Brehm, 1981; Dillard & Shen, 2005). Negative reactance emotions include annoyance, irritation, aggravation, and anger. Reactance cognitions include thoughts about the message sender, liking of the message, and efficacy (Dillard & Shen, 2005).

Social influence attempts frequently incur reactance in the target of the influence (Brehm, 1966). In the context of couples discussing healthy eating and physical activity, negative face may be threatened by asking a person to change their behaviors around eating and physical activity. If reactance ensues from the threat to negative face, rather than feeling inspired to make changes, the message recipient may become motivated to reject the message. In other words,

when messages run counter to the autonomy needs of the addressee (i.e., they threaten negative face), reactance is likely to occur.

Negative FTAs, as described above, constrain autonomy and violate freedom; as such, they are more explicitly linked to reactance. However, positive FTAs may lead to reactance as well. Positive FTAs can be disrespectful and contain forceful language (Jenkins & Dragojevic, 2011), thereby threatening face and inducing reactance. Smith and colleagues (2016) explain, "negative face threats should induce reactance due to their violation of freedoms, whereas positive face threats might invoke reactance through their perceived disrespect" (p. 510). Though less prevalent than research linking negative face threat to reactance, some research does indicate an association between positive face threat and reactance emotions (Paik, 2020). Based on this logic, we predict that both types of FTAs can evoke reactance in the message receiver in the context of healthy eating and physical activity conversations.

In addition to participant reports of face threat in response to partner messages, we are interested in examining associations between observed face threat and participant reports of reactance to triangulate and strengthen findings. By examining the content of reported conversations between partners, researchers can rate face threatening message features such as direct requests or demands that participants may not be aware of. We predict that both participant-rated and observed (i.e., researcher-rated) face threat will be positively associated with reports of reactance.

H1: Daily (a) reported perceptions and (b) observations of negative face threat are positively associated with daily reports of reactance.

H2: Daily (a) reported perceptions and (b) observations of positive face threat are positively associated with daily reports of reactance.

When working to increase healthy behaviors through partner communication, past research and theorizing (e.g., Dailey et al., 2010) indicates that partners need to reduce autonomy-threat and increase autonomy support (i.e., use FMSs) in their messages to reduce the potential for reactance and increase message persuasiveness (Jenkins & Dragojevic, 2011; Miller et al., 2007). If these efforts are not made, messages may backfire and instead induce the opposite behavior to what is desired (Worchel & Brehm, 1970). Changes in how messages are phrased can minimize threat to positive and negative face.

The inclusion of positive and negative FMSs detailed above in partner messages are likely associated with reduced reactance to healthy eating and physical activity messages (see Wilcox et al., 2020). Autonomy-threat (i.e., negative face threat) may be reduced, for example, by being indirect, using hedging language, listening, and/or offering options to the receiver (e.g., "Maybe we could go for a walk after dinner;" "Do you want me to watch the kids in the morning or at night so that you can work out?"). Past research in the classroom context supports this. Teachers frequently make autonomy threatening requests of students (Bills, 2000; Cazden, 1979), and research has found that when teachers use face mitigation strategies such as polite language, face threat is reduced and reactance is mitigated (Zhang & Sapp, 2013). Compliments, a positive FMS, may reduce threats to positive face, as they communicate approval of a person (e.g., "Ever since you started taking cooking classes, your meals are way better than anything we can get at a restaurant!") For example, couples that used more person-centered messages after marital disagreements report lower perceived face threat and reactance than couples that used low person-centered messages (Tian et al., 2020). The theoretical mechanisms by which *positive* FMSs lead to lower reactance to partner messages have not been systematically investigated, yet

theoretically, the use of both positive and negative FMSs should be inversely associated with reports of reactance.

H3: Observed daily negative FMSs are negatively associated with daily reports of reactance.

H4: Observed daily positive FMSs are negatively associated with daily reports of reactance.

FMSs as Mitigators of Face Threat

As described above, negative and positive FTAs constrain autonomy and communicate disrespect, thereby leading to reactance, whereas negative and positive FMSs support autonomy and communicate approval, thereby reducing reactance. As such, we are interested in how face threat and FMSs may interact in their association with reactance. FMSs can mitigate the negative effects of face threat (Brown & Levinson, 1987, Goldsmith, 1994) potentially neutralizing the effects of face threat on reactance. For example, FMSs like offering choices or making indirect suggestions work to reduce autonomy threat. According to Kunkel and colleagues (2003), FMSs can be used to avoid face threats such as pressuring one's partner or limiting their freedom. It is unclear, however, whether FMSs are sufficient to counteract the potential damage (i.e., communicated constraint and/or disrespect) done by face-threatening messages. In a study on advice (an inherently negative face-threatening speech act; Brown & Levinson, 1987), Goldsmith and MacGeorge (2000) examined how the use of FMSs impacted perceived face threat. Their results varied with some FMSs reducing face threat while others did not. Based on inconsistent findings in past research, we pose a research question about the mitigating effect of FMSs on the association between face threat and reactance.

RQ: Does the use of positive or negative FMSs in a memorable health conversation mitigate the association between face threat and reactance?

Health Behavior Outcomes of Reactance

Reactance may manifest *behaviorally* by the partner engaging in activities counter to what is advocated. When people perceive threats to autonomy, they tend to attempt to restore freedom directly or indirectly (Brehm & Brehm, 1981). Conversations about eating and physical activity are especially problematic if instead of improving health behaviors, reactance leads the message target to do the opposite of what was suggested to restore freedom and reduce psychological discomfort – a so-called boomerang effect (Yan et al., 2010). Take, for example, a couple discussing making a change to their physical activity habits. A partner may experience negative face threat and reactance if they hate running and would rather bicycle, but their spouse insists that they run together three times a week. The spouse who hates running may decide not to exercise at all to restore their freedom. If a person was told not to eat cake at a birthday party, they may seek to restore their freedom by doing a variety of actions such as engaging in the forbidden act (e.g., eating the cake) or exercising a different freedom to regain the feeling of control and choice (e.g., eating potato chips). Based on past research that has identified a potential boomerang effect of reactance, we predict the following:

H5: Daily reports of reactance are inversely associated with daily reports of (a) healthy eating and (b) physical activity behaviors.

Method

Procedures

Heterosexual, cohabitating romantic dyads (N = 70 dyads) were recruited from a community SONA pool hosted by the researchers' university in the Midwest region of the

United States. This paid pool includes over 8,600 local community members with a range of demographic characteristics. In phase one of the research, both partners in the dyad completed a pre-survey to assess demographic information, aspects of the couple's relationship (e.g., length of relationship, relational satisfaction), and individual eating and physical activity behaviors. Other than demographic information, pre-survey measures are not reported here. In phase two of the research, one partner completed a 10-day diary survey, which is the focus of the present report. That member of the couple was sent daily emails at 7 p.m. that included a link to the survey assessing daily conversations, face threat, and reactance. They were instructed to respond by midnight that evening. All phases of the study were approved by the researchers' Institutional Review Board.

Participants

To be included in the study, both members of the couple must have met the following criteria at the time of enrollment: (a) 25-65 years of age; (b) cohabitating with their heterosexual romantic partner;[1] and (c) must not be cognitively impaired, pregnant, or have been diagnosed with cancer. The participant responding to the daily surveys needed to meet the following inclusion criteria at the time of enrollment: (a) failing to meet the U.S. government-recommended guideline for fruit and vegetable intake (i.e., at least five daily servings) and/or physical activity (i.e., at least 75 minutes of vigorous-intensive aerobic activity or 150 minutes of moderate-intensity aerobic activity weekly, or some combination thereof); (b) be seeking to increase physical activity and/or improve their healthy eating over the next month; and (c) be willing and able to complete a 10-day diary survey. Couples who completed the pre-survey

[1] Heterosexual couples were recruited so that dyadic data could be distinguished by sex. Dyadic data results are not reported here.

received a $25 Amazon e-gift card, and diary study participants received an additional $55 Amazon e-gift card as compensation for completing at least 7 of the 10 daily surveys.

Diary study participants (n = 70) were on average 37.22 years of age (SD = 9.09). Most were female (74%), and 77% identified as White, 11% identified as Asian American/ Pacific Islander, 4% identified as Black, 3% identified as Arab American, and 5% declined to identify their race or reported an unlisted race. In addition, 9% reported they were Hispanic/Latinx. Average relationship length reported by diary study participants was 11.21 years (SD = 8.98). Participants reported having an average of 2.03 children (SD = 1.11).

Daily Diary Measures

Message Recall

Each day, we asked participants to recall a conversation they had that day with their partner regarding healthy eating and/or physical activity. Specifically, we asked participants: "Did you talk to your partner about diet or physical activity today?" If the participant had, we asked them to "Please recall the most memorable conversation that you had with your partner today about making changes to your diet/physical activity levels. This conversation could have been in person, on the phone, or via text message/email." Then, to encourage participants to provide details of the conversation as completely as possible, we asked them to "Please tell us, word for word, what you said and what your partner said and did during that conversation as if you were writing down a conversation in a book." They were then provided with a text box of sufficient length to report a conversation in full. If participants reported they did not have a conversation with their partner about healthy eating or physical activity, they were asked a set of questions not included in the present study. After reporting the conversation, they completed

scales of perceived FTAs, FMSs, and reactance and reported their eating and physical activity behaviors.

Perceived Face Threat

Perceived positive and negative face threat were assessed by participants using a 14-item instrument developed by Cupach and Carson (2002). Four items assessed negative face threat (e.g., "During this conversation, my partner constrained my choices"), (M = 1.68, SD = 0.98, average α = .86, SD = .08). Ten items assessed perceived positive face threat (e.g., "During this conversation, my partner was hostile"), (M = 2.36, SD = 0.84, average α = .74, SD = .07). All items were rated on 7-point Likert-type scales.

Reactance

Per Dillard and Shen (2005), we included assessments of both reactance emotions as well as reactance cognitions. Reactance emotions were operationalized as feelings of anger following the memorable conversation. Participants responded to four items with the stem "How did you feel after the conversation?" (e.g., "angry"). Items were rated on a 5-point scale ranging from *not at all* to *extremely* (M = 1.21, SD = 0.48, average α = .88, SD = .12). Reactance cognitions were operationalized as self-efficacious thoughts about one's ability to meet diet and physical activity goals following the conversation. Four 7-point Likert-type items assessing self-efficacy post-conversation were adapted from Holmstrom and Burleson (2011; e.g., "After this conversation, I felt like I could do what it takes to meet my diet and/or physical activity goals.") (M = 2.96, SD = 1.41, average α = .93, SD =.02). After reverse coding, higher scores indicated lower self-efficacy (i.e., greater reactance). All items were then averaged into one reactance composite scale (M = 2.10, SD = 0.73, average α = .66, SD = .12).

Healthy Eating and Physical Activity

Healthy eating behavior was assessed daily using a 1-item measure "After our conversation, I did eat healthier" with a 7-point Likert-type scale (M = 4.47, SD = 1.6). Physical activity behavior was assessed daily using a 1-item measure "After our conversation, I engaged in physical activity" with a 7-point Likert-type scale (M = 3.91, SD = 1.9).

FTA and FMS Rating Procedures

Guides for rating negative and positive FTAs and FMSs were developed based on face and politeness theory (Brown & Levinson, 1987; Deci et al., 2001) by four of the researchers over a period of twelve weeks, in a series of weekly 1-hour meetings at which definitions and rules were developed and refined along with a 5-point rating system for intensity of the FTA or FMS. The guides provided a definition of each FTA and FMS, a scale for rating intensity of each, a detailed list of examples of each type and strategy, and a set of rules for raters to follow. See below for operationalizations used for each guide, and Table 1 for ratings descriptions, examples, and frequency of occurrence across the entire dataset.

Unitizing and ranking FTAs and FMSs based on Brown and Levinson's original theoretical classification has been a subject of debate (see Lim & Bowers, 1991). This prompted us to develop an in-depth rating scheme based on research examining facework. To identify FTAs and FMSs in conversations, we relied heavily on Brown & Levinson's (1987) classification of FTAs (p. 313-315), and redressive actions for negative and positive FMSs (p. 317). Additionally, our rating guide was grounded in a review from Dillard and colleagues (1997) indicating that the explicitness, dominance, and argument of FTAs are important to consider. We defined and operationalized negative and positive face threat and FMSs using Brown and Levinson's original classification scheme and subsequent findings regarding dimensions of facework. *Negative FTA* was operationalized as statements from partners that

specify, or suggest a desire that participants perform some future behavior(s), wherein the specified behavior(s) puts pressure on the participant to accept or reject the specified or suggested act. *Positive FTA* was operationalized as statements that (a) indicate the partner does not care about the participant's feelings, wants, or actions, (b) are negative evaluations of the participant, or (c) indicate a partner does not care about the participant's self-identity. *Negative FMSs* were operationalized as statements that allow a partner to have personal initiative and/or encourage or support participant choices. Parallel to our operationalization of positive FTAs, *positive FMSs* were operationalized as statements that (a) indicate the partner *does* care about the participant's feelings, wants, or actions, (b) that are *positive* evaluations of the participant, or (c) indicate a partner *does* care about the participant's self-identity. See Table 1 for examples of negative and positive FTAs and FMSs.

For each conversation, raters selected a score from 0- *no instance* to 4- *most explicit and severe* use of face threat or FMSs, to indicate the intensity of the example. For face threat, Brown & Levison (1987) proposed that clearly and intentionally committing an FTA (rated 4; bald on-record) is most problematic and likely to elicit negative actions, followed by intentional FTAs with redress (3; bald on record with redress), using ambiguous statements or language to minimize or obscure FTAs (2 or 1; off-record), and, lastly, refraining from any type of face threating act (0; no instance). For FMSs, we followed a similar scheme for face threats but rather than FTAs, the acts supported or strengthened face. Most explicit and intense FMSs (4) used clear and intentional language or acts to grant freedoms or support face, followed by (3) FMSs that generally granted freedom or supported face of the participant, or FMSs that explicitly granted freedom or supported the *couple*. Since *face* is conceptualized as the *self*-image (Brown & Levinson, 1987), FMSs that are directly about that self should be most supportive to that

image compared to FMSs about the couple or indirectly about the self; (2) using language or acts to show some interest in granting or facilitating choices, (1) using language or simple agreement in attempt to minimize threatening acts, and lastly, (0) utilizing no FMSs.

Following development of the rating guides, two undergraduate and two graduate student raters were trained to rate diary conversations for the presence and intensity of FTAs and FMSs (i.e., negative/positive FTAs, negative/positive FMSs) in daily memorable conversations about eating and physical activity. The unit of analysis was the entire conversation, focusing only on what the partner said to the participant. Raters were trained to indicate the degree (0-4) that face threat or FMSs occurred in each reported conversation. When conversations had multiple instances of FTAs or FMSs, raters were instructed to give the conversation the highest rating observed (i.e., if a conversation included a negative FTA that would be rated as 1 and a negative FTA that would be as 4, the rater was instructed to rate the conversation as 4, the highest rating).

Raters were trained by the research team over the course of 5.5 hours. Inter-rater reliability was assessed using Krippendorff's α (Krippendorff, 1970). Rater reliability was assessed after training on a random selection of 11% of the conversations; negative FTA: α = .94; positive FTA: α = 1.00; negative FMS: α = .77; positive FMS: α = .94. Next, each rater was assigned to individually rate ¼ of a random selection of 78% of the conversations. To check for drift, after individually rating their assigned conversations, all four raters then rated the remaining 11% of the conversations for negative FTA, α = .92; positive FTA, α = .97; negative FMS, α = .94; and positive FMS, α = .89. This check confirmed that reliability was maintained.

Results

Data Preparation and Preliminary Results

Two waves of data collection occurred in October 2019. Most people participated in the first wave. A second wave was offered to people who were unable to complete diaries in the first wave (e.g., they were traveling). Participants completed between 1 and 10 diary entries (M = 8.89, SD = 1.68). In total, 622 diaries were completed by participants, with 209 of those diaries including reports of conversations between couples (M = 3.00, SD = 2.85). Of the 209 conversations reported, 178 conversations discussed physical activity and/or healthy eating, with an average of 77 words per conversation. Conversation entries were excluded (n = 31) if raters could not determine who said what in the conversation, if the entry did not include a conversation (i.e., some participants wrote about their eating/physical activity habits with no partner interaction), or if the conversation did not focus on eating and/or physical activity. Correlations for all study variables can be found in Table 2.

The diary data were analyzed using a series of multilevel models in SPSS using the MIXED procedure. To assess the impact of daily FTAs (participated-rated and observer-rated) and FMSs (observed-rated) on reactance, and the daily influence of reactance on healthy eating and exercise over a 10-day period, multilevel models with two levels were constructed (level 1: repeated dairy entries, and level 2: differences between individuals). Unconditional models were estimated first to assess whether there was significant variability in the random intercepts that could be explained between individuals across diary entries (see Table 3). The model for reactance demonstrated significant variability across individuals across entries (b = 2.14, 95% CI [1.99, 2.30]), and the models for healthy eating (b = 0.75, 95% CI [0.40, 1.40]) and physical activity (b = 1.41, 95% CI [0.85, 2.35]) demonstrated significant variability across individuals across entries.

Next, several models using maximum likelihood estimation were tested to compare model fit (e.g., AIC, BIC). The eight best fitting models were used to test our hypotheses (see Tables 4-7). Time was included as a fixed effect to examine whether, on average, diary entry assessments varied significantly by day within individuals. Time was not significant in any model but was retained as a control variable. Participant-reported negative face threat was not significantly correlated to observed face threat ($p = .21$) but reported and observed positive face threat were ($r(68) = .28$, $p < .001$). Table 4 contains the model fit and statistics for perceived and observed face threat on reactance. Positive and negative face threat (participant-reported $r(68) = .69$, $p < .001$; observed $r(68) = .43$, $p < .001$) and FMSs (observed $r(68) = .28$, $p < .001$) were significantly correlated, and therefore were not included in the same models due to multicollinearity effects. See Table 5 for model fit and statistics for FMSs on reactance. For the model fit and statistics for the interaction effects between face threat and FMS on reactance, see Table 6. For the model fit and statistics for reactance on healthy eating and physical activity, see Table 7.

Main Analyses

H1a predicted that daily perceptions of negative face threat would be positively associated with daily reports of reactance. The results revealed a significant fixed effect of reported negative face threat on daily reports of reactance ($b = 0.26$, 95% CI [0.16, 0.36]). As negative face threat increased, so did reports of reactance. The data were consistent with H1a.

H1b predicted that observed daily negative face threat would be positively associated with daily reports of reactance. There was no significant fixed effect of observed negative face threat on daily reports of reactance ($b = -0.08$, 95% CI [-0.07, 0.04]). The data were not consistent with H1b.

H2a predicted that daily perceptions of positive face threat would be positively associated with daily reports of reactance. The results revealed a significant fixed effect of reported positive face threat on daily reports of reactance (b = 0.43, 95% CI [0.33, 0.53]). As positive face threat increased, so did reports of reactance. The data were consistent with H2a.

H2b predicted that observed daily positive face threat would be positively associated with daily reports of reactance. There was a significant fixed effect between observed positive face threat and daily reports of reactance (b = 0.09, 95% CI [0.02, 0.16]). As observed positive face threat increased, so did reports of reactance. The data were consistent with H2b.

H3 predicted that observed daily negative FMSs would be inversely associated with daily reports of reactance. The results revealed a significant fixed effect of observed negative FMSs on daily reports of reactance (b = -0.08, 95% CI [-0.14, -0.02]). As observed negative FMSs increased, reports of reactance decreased. The data were consistent with H3.

H4 predicted that observed daily positive FMSs would be inversely associated with daily reports of reactance. There was a significant fixed effect of observed positive FMSs on daily reports of reactance (b = -0.15, 95% CI [-0.22, -0.06]). As observed positive FMSs increased, reports of reactance decreased. The data were consistent with H4.

RQ1 asked whether the use of positive or negative FMSs mitigate the association between face threat and reactance. No significant interactions were found. See Table 7 for the unstandardized coefficients and standard errors of the interactions.

H5 predicted that daily reports of reactance would be inversely associated with daily reports of (a) healthy eating and (b) physical activity. The results revealed a significant fixed effect of reactance on daily reports of healthy eating (b = -1.23, 95% CI [-1.48, -0.87], and

physical activity (b = -1.18, 95% CI [-0.22, -0.06]). As reactance increased, reports of healthy eating and physical activity decreased. The data were consistent with H5a and b.

Discussion

Guided by politeness theory and the reactance framework, we aimed to understand how FTAs and FMSs were associated with the experience of psychological reactance in healthy eating and physical activity discussions among couples. In addition, we aimed to explore the association between reactance to such conversations and resultant healthy eating and physical activity behaviors. Participants completed up to ten diary entries describing daily memorable conversations about eating and physical activity. The results indicate that both negative and positive face threat perceived in conversations and positive face threat rated from conversations were associated with increased reports of reactance cognitions and emotions. Over a one-week period, daily reactance to healthy eating and physical activity conversations was associated with reduced daily healthy eating and physical activity behaviors.

Theoretical Implications

The results of this study have implications for politeness theory and the study and conceptualization of reactance. Specifically, this study identifies some of the communicative mechanisms by which reactance is evoked (i.e., FTAs) and reduced (i.e., FMSs) in romantic partner conversations. Research has long predicted a link between threats to freedom (i.e., negative face threat) and reactance (Dillard & Shen, 2005) but the association between positive face threat and reactance has not been as clearly articulated or examined (for exceptions, see Paik, 2020; Smith et al., 2016). The present study contributes to the growing evidence that negative face threat is associated with increased reactance in response to a message. In addition, our results indicate that like with negative FTAs, the intensity of positive FTAs, or threats to

one's need for approval, is positively associated with reactance ratings. Messages that threaten the liking or respect of a person increase their reports of anger and reduce their self-efficacy thoughts.

The ability of FMSs to reduce reactance has theoretical support in that FMSs often increase the persuasiveness of a message (Miller et al., 2007) and reactance is a marker of failed social influence (Worchel & Brehm, 1970), but this logic had not yet been tested to our knowledge. In this study, the use of positive and/or negative FMSs by a partner in a healthy eating and physical activity message was associated with reduced reports of reactance emotions and cognitions. This indicates that when messages include attempts to hedge, give choices, or compliment the receiver (among other strategies), message targets report less anger and higher self-efficacy thoughts.

In addition to these links, our results show that reactance emotions and cognitions in response to healthy eating and physical activity conversations are associated with reduced healthy eating and physical activity behaviors. Those who reported conversations in which they experienced anger, irritability, and/or low self-efficacy thoughts reported reduced healthy eating and levels of physical activity that day. This finding indicates the importance of understanding how reactance works for effective couple communication aimed at increasing protective health behaviors including how couples and others can actively reduce invoking reactance in conversations.

Based on the literature, we expected that FMSs would have a mitigating effect on FTAs. Interestingly, face threat did not interact with FMSs on ratings of reactance. We offer three potential explanations for this finding. First, face-threatening language and face management language did not consistently co-occur in our data. In fact, only reported positive face threat was

significantly associated with the use of negative and positive FMSs. Thus, it appears from our data that individuals tend to engage in *either* intense FTAs or FMSs, perhaps using FMSs to avoid the FTAs of pressuring their partner, limiting their freedom, or conveying dislike (e.g., Kunkel et al., 2003). Second, for cases in which highly-rated FTAs and FMSs *do* co-occur, research indicates that FMSs do not always mitigate the damage done by FTAs (e.g., Goldsmith & MacGeorge, 2000). In the context of diet and physical activity behaviors, FTAs are common and damaging (Romo, 2018) and may leave FMSs unable to soften the threat. Third, the conversations recorded in our study often included no rated FTAs or FMSs, reducing our power to observe significant effects. Specifically, almost half of the reported conversations were rated as having no positive or negative FTAs and no positive FMSs, and over half were rated as having no negative FMSs.

The reason for the relative lack of FTAs or FMSs is unknown, though it is possible that these conversations are indeed relatively rare in daily conversation, especially amongst couples satisfied enough in their relationship to participate in a dyadic study. It is also possible that participants did not accurately recall (or chose not to report on) conversations that emphasized FTAs and/or FMSs. However, it is important to note that despite the null interactions and relative infrequency of FTAs and FMSs in these data, independently, FTAs and FMSs largely had their predicted effects. A takeaway from our data is that while FMSs do not appear to "undo" the effect of FTAs on reactance, FMSs reduce reactance when used independently.

Contributions to Measurement of Reactance, FTAs, and FMSs

This study developed and utilized strong measures of reactance, positive and negative face threat, and FMSs. There has been some debate about how to best measure reactance (see Ratcliff, 2019; Wilcox et al., 2020). Our study utilized the intertwined model of reactance

forwarded by Dillard and Shen (2005) that conceptualizes reactance as consisting of both self-reported negative cognition and anger. Traditionally, negative cognition has been captured through time intensive thought listing tasks (Dillard & Shen, 2005; Reynolds-Tylus et al., 2021). Following the lead of esteem support research (e.g., Holmstrom & Burleson, 2011; Shebib et al., 2020), we developed items to capture self-efficacy thoughts that were reliable and context specific and were associated with reactance emotions. (e.g., "I felt like I could do what it takes to meet my goals").

We triangulated methods of measuring face threat to bolster our claims that the intensity of face threat is associated with reports of reactance. We found that both participant diary survey reports and rated instances of positive face threat in memorable partner conversations about eating and physical activity were negatively associated with reports of reactance to those conversations. This indicates that when messages contain disapproval, criticism, accusations, or challenges directed at the target of the message; dismissal of goals or criticism and disapproval; hostility; blatant noncooperation in joint activities, explicit irreverence, or general disagreement; or advice or requests that imply the superiority of the partner's opinion, participants tended to report higher reactance emotions (e.g., anger and irritability) and reduced self-efficacy cognitions.

Negative face threat, however, was only associated with reactance when it was operationalized as participant reports of whether their partner "invaded [their] privacy", "made [them] look bad in the eyes of others", "took away some of [their] independence", and "constrained [their] choices" during the memorable conversation. Observer ratings of negative face threat in the memorable conversations as recalled by participants were not significantly associated with participants' reports of reactance. It might be that participants' *perceptions* of the

intensity of negative FTAs were simply more important than what was observed in the messages. In other words, a participant may perceive their autonomy was threatened even if the threat cannot be pinpointed in the message. Their perceptions drove their feelings of reactance. It is also possible that negative FTAs are communicated nonverbally or otherwise in ways inaccessible to the researcher reading the memorable conversation. It might also be that conversations about one's physical activity and/or eating inherently threaten negative face, even if face threatening words and phrases like "you must" are missing from the conversation. That is – simply having a conversation about eating and physical activity might imply an autonomy threat undetectable in the recalled messages. Politeness theory supports this line of reasoning as some speech acts, especially those that are emotional or may be perceived as critiques, are inherently face threatening (Brown & Levinson, 1987). Finally, participants may not have written down the parts of the conversation that were face threatening, even if they were left with an overall sense of autonomy threat after the conversation.

Another contribution to the measurement of FTAs and FMSs was the rating scheme we developed for observing positive and negative FMSs in diary recalled memorable conversations about eating and physical activity (see Table 1). A strength of this rating scheme is its ability to capture FMSs that predict reduced reactance in response to the recalled memorable conversations. Participants may struggle to articulate whether messages contain FMSs if they do not know what they are looking for (e.g., smoothing over language; explicit vs. generic approval) but likely can easily recall whether the conversation made them feel their autonomy was threatened or they were disrespected. In other words, face threat is likely accessible for participants to report, but rating FMSs may be the most accurate way to capture FMSs when assessing memorable conversations. That said, we encourage future research aimed at

developing measures of FMSs, especially research that can assess these strategies and resulting reactance as it occurs (see Wilcox et al., 2020).

Finally, our study utilized a daily diary method to capture eating and physical activity messages over a 10-day span. Advantages of this method include (a) examining change over time and (b) increased data accuracy compared to collecting conversations at a single time point or asking participants to recall conversations from prior weeks or months. However, time was not a significant predictor in our models. This may indicate that people are fairly consistent in their use of FTAs and FMSs, as opposed to increasing or decreasing their use of either over the span of 10 days. This may also indicate that collecting conversations at one point in time is sufficient to understand average use of FTAs and FMSs in couple conversations about healthy eating and physical activity.

Practical Implications

Intimate partners can have a make-or-break influence on their partners' personal health behaviors (Ata et al., 2007; Dailey et al., 2010; Graham et al., 2007; Helgeson et al., 2019; Worobey, 2002). Health-related change messages from intimate partners are critical communicative levers that can positively influence health behavior – if those messages are delivered sensitively. Unfortunately, partners often use message strategies that fail (Burke & Segrin, 2015; Butterfield & Lewis, 2002; Helgeson et al., 2004; Logic et al., 2009; Tucker & Anders, 2001). The results of this study have important implications for couples who wish to support one another's efforts toward making healthy eating and physical activity changes and for professionals who advise individuals and couples on making these types of changes. Partners who want to help motivate one another to eat and move more healthfully should avoid both types of FTAs. The rating scheme developed in this study provides myriad examples of what high and

low negative and positive face threat look and sound like in real couple conversations. With more testing, these messages could be used in a scalable web-based tool kit that teaches couples about threatening and non-threatening messages. The rating scheme and examples of positive and negative FMSs could be used to show couples what they might say instead of face threatening messages that are too direct, disrespectful, or unintentionally discouraging. Professionals who support couples attempting to motivate and support one another (e.g., doctors, therapists) could use these messages to develop interventions for couples where they learn how to avoid threatening one another while effectively motivating one another to change their eating and physical activity behaviors for the better.

Limitations

Despite the strengths of the present study, several limitations should be noted. First, participants recorded conversations on an average of three days out of 10. It is unknown whether this frequency reflects reality (i.e., couples do not talk about healthy eating and physical activity every day), or if it is due to participants misremembering or declining to report the conversations they had with their partner. Though frequency of interaction was not a focus of the present study, we ultimately received less data than we had anticipated. In future, data could be collected for a longer time period (e.g., one month) to increase the number of conversations available for analysis.

The present study relied on retrospective reports of memorable conversations. Though research has shown that people are able to recall the content of memorable messages (e.g., Knapp et al., 1981), it is also the case that they sometimes recall message intentions (e.g., “he wanted to help”) as opposed to the specific content of messages (Burleson & MacGeorge, 2002). To account for this tendency, we asked participants to recall their conversation word-for-word,

as if it was written in a book, which many participants did. Still, it is unlikely that messages were recalled verbatim (e.g., Benoit, Benoit, & Wilkie, 1995). In future, conversations could be recorded in a laboratory setting and transcribed for analysis. Additionally, we captured only one person's perspective of the conversation and their reactions to it. Future research should include both members of the dyad to unpack the transactional nature of conversations about healthy eating and physical activity.

Finally, the sampling strategy focused on cohabitating heterosexual couples, limiting the extent to which results may be generalized. These couples were also largely White and living in the U.S. Future research should seek to include a broader representation of couples.

Conclusion

We set out to explore the links between ratings of FTAs and FMSs in memorable daily conversations about healthy eating and physical activity, psychological reactance to those conversations, and the healthy eating and physical activity behaviors following those conversations. The results indicate that positive and negative face threat increase reactance following a healthy eating and physical activity conversation and the inclusion of FMSs decrease reactance to such conversations. Results also showed that reactance to these types of conversations subsequently reduces actual healthy eating and physical activity behavior. The study contributed to identifying the communicative mechanisms that bring about reactance and linking reactance to health behavior change. The results have important implications for couples who wish to support one another's efforts toward making healthy eating and physical activity changes.

References

Ata, R. N., Ludden, A. B., & Lally, M. M. (2007). The effects of gender and family, friend, and media influences on eating behaviors and body image during adolescence. *Journal of Youth and Adolescence, 36*(8), 1024-1037. https://doi.org/10.1007/s10964-006-9159-x

August, K. J., & Sorkin, D. H. (2010). Marital status and gender differences in managing a chronic illness: The function of health related social control. *Social Science & Medicine, 71*, 1831–1838. https://doi.org/10.1016=j.socscimed.2010.08.022

Benoit, W. L., Benoit, P. J., & Wilkie, J. (1995). Participants' and observers' memory for conversational behavior. *Southern Communication Journal, 61*, 139–155. https://doi.org/10.1080/10417949609373007

Bills, L. (2000). Politeness in teacher–student dialogue in mathematics: A socio-linguistic analysis. *For the Learning of Mathematics*, 20, 40 – 47.

Brehm, J. W. (1966). *A theory of psychological reactance*. Academic Press.

Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. Academic Press.

Brown, P., Levinson, S. C. (1987). *Politeness: Some universals in language usage* (Vol. 4). Cambridge University Press.

Burke, T. J., & Segrin, C. (2017). Weight-related social control in couples: Associations with motives, constraints, and health behaviors. *Communication Research, 44*(3), 348-366. https://doi.org/10.1177%2F0093650215590606

Burleson, B. R., & MacGeorge, E. L. (2002). Supportive communication. In M. L. Knapp & J. A. Daly (Eds.), *Handbook of interpersonal communication* (3rd ed., pp. 374–424). Sage.

Butterfield, R. M., & Lewis, M. A. (2002). Health-related social influence: A social ecological perspective on tactic use. *Journal of Social and Personal Relationships, 19*(4), 505-526. https://doi.org/10.1177%2F0265407502019004050

Carlson S. A., Adams E. K., Yang Z., Fulton J. E. (2018). Percentage of deaths associated with inadequate physical activity in the United States. *Preventing Chronic Disease, 15*, E38. https://doi.org/10.5888/pcd18.170354

Cazden, C. B. (1979). "Language in education: Variation in the teacher-talk register". In *Language in public life: Georgetown University round table on languages and linguistics*. Eds. G. R. Tucker, and J. E. Alatis, J. E. 144–162. Georgetown University Press.

Cunningham, C., O'Sullivan, R., Caserotti, P., & Tully, M. A. (2020). Consequences of physical inactivity in older adults: A systematic review of reviews and meta-analyses. *Scandinavian Journal of Medicine & Science in Sports, 30*, 816-827. https://doi.org/10.1111/sms.13616

Cupach, W. R., & Carson, C. L. (2002). Characteristics and consequences of interpersonal complaints associated with perceived face threat. *Journal of Social and Personal Relationships, 19*(4), 443-462. https://doi.org/10.1177/0265407502019004047

Dailey, R. M., Richards, A. A., & Romo, L. K. (2010). Communication with significant others about weight management: The role of confirmation in weight management attitudes and behaviors. *Communication Research, 37*(5), 644-673. https://doi.org/10.1177/0093650210362688

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former

eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, *27*(8), 930-942. https://doi.org/10.1177/0146167201278002

Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. *Communication Monographs*, *72*(2), 144-168. https://doi.org/10.1080/03637750500111815

Fox, N. J., & Ward, K. J. (2008). What are health identities and how may we study them? *Sociology of Health & Illness*, *30*(7), 1007-1021. https://doi.org/10.1111/j.1467-9566.2008.01093.x

Goldsmith, D. J. (1994). The role of face work in supportive communication. In B. R. Burleson, T. L. Albrecht, & I. G. Sarason (Eds.), Communication of social support: Messages, interactions, relationships, and community (pp. 29-49). Sage.

Goldsmith, D. J., & MacGeorge, E. L. (2000). The impact of politeness and relationship on perceived quality of advice about a problem. *Human Communication Research*, *26*(2), 234-263. https://doi.org/10.1111/j.1468-2958.2000.tb00757.x

Graham J. E., Christian L. M., Kiecolt-Glaser J.K. (2007). Close relationships and immunity. *Psychoneuroimmunology*, *4*, 781-798. https://doi.org/10.1016/b978-012088576-3/50043-5

Helgeson, V. S., Berg, C. A., Kelly, C. S., Van Vleet, M., Zajdel, M., Tracy, E. L., & Litchman, M. L. (2019). Patient and partner illness appraisals and health among adults with type 1 diabetes. *Journal of Behavioral Medicine*, *42*(3), 480-492. https://doi.org/10.1007/s10865-018-0001-1

Helgeson V. S., Novak S. A., Lepore S. J., Eton D. T. (2004). Spouse social control efforts: Relations to health behavior and well-being among men with prostate cancer. *Journal of*

Social and Personal Relationships, 21(1), 53-68. https://doi.org/10.1177/0265407504039840

Holmstrom, A. J., & Burleson, B. R. (2011). An initial test of a cognitive-emotional theory of esteem support messages. *Communication Research, 38*, 326-355. https://doi.org/10.1177/0093650210376191

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PloS Medicine, 7*, e1000316. https://doi.org/10.1371/journal.pmed.1000316

Jenkins, M. & Dragojevic, M. (2011). Explaining the process of resistance to persuasion: A politeness theory-based approach. *Communication Research, 40,* 559-590. https://doi.org/10.1177/0093650211420136

Katzmarzyk P.T., Lee I.M. (2012). Sedentary behaviour and life expectancy in the USA: A cause-deleted life table analysis. *BMJ Open, 2*(4), e000828. https://doi.org/10.1136/bmjopen-2012-000828

Keeney, R. L. (2008). Personal decisions are the leading cause of death. *Operations Research, 56*(6), 1335-1347. https://doi.org/10.1287/opre.1080.0588

Knobloch, L. K., & Theiss, J. A. (2010). An actor—partner interdependence model of relational turbulence: Cognitions and emotions. *Journal of Social and Personal Relationships, 27*(5), 595-619.

Knapp, M. L., Stohl, C., & Reardon, K. K. (1981). ‘‘Memorable’’ messages. *Journal of Communication, 31*, 27–41. https://doi.org/10.1111/j.1460-2466.1981.tb00448.x

Krebs-Smith, S. M., Guenther, P. M., Subar, A. F., Kirkpatrick, S. I., & Dodd, K. W. (2010). Americans do not meet federal dietary recommendations. *The Journal of Nutrition*, *140*(10), 1832-1838. https://doi.org/10.3945/jn.110.124826

Krippendorff, K. (1970). Bivariate agreement coefficients for reliability of data. *Sociological Methodology*, *2*, 139-150. https://doi.org/10.2307/270787

Kunkel, A. D., Wilson, S. R., Olufowote, J., & Robson, S. (2003). Identity implications of influence goals: Initiating, intensifying, and ending romantic relationships. *Western Journal of Communication, 67*(4), 382-412. https://doi.org/10.1080/10570310309374780

Lim, T. S., & Bowers, J. W. (1991). Facework solidarity, approbation, and tact. *Human Communication Research*, *17*(3), 415-450.

Logic M., Okun M.A., Pugliese, J. A. (2009). Expanding the mediational model of the effects of health-related social control. *Journal of Applied Social Psychology, 39*(6),1373-1396. https://doi.org/10.1111/j.1559-1816.2009.00486.x

Miller, C. H., Lane, L. T., Deatrick, L. M., Young, A. M., & Potts, K. A. (2007). Psychological reactance and promotional health messages: The effects of controlling language, lexical concreteness, and the restoration of freedom. *Human Communication Research*, *33*(2), 219-240. https://doi.org/10.1111/j.1468-2958.2007.00297.x

Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *JAMA, 291*(10), 1238-1245. https://doi.org/10.1001/jama.291.10.1238

Owen N., Sparling P.B., Healy G.N., Dunstan D.W., Matthews CE. (2010) Sedentary behavior: Emerging evidence for a new health risk. In *Mayo Clinic Proceedings, 85*(12), 1138-1141. https://doi.org/10.4065/mcp.2010.0444

Paik, J. E. (2020) The contextual effects of advice solicitation on advice outcomes: The role of perceived face threats and psychological reactance. *Communication Monographs, 87,* 70-91. https://doi.org/10.1080/03637751.2019.1641729

Ramos, K., Langer, S. L., Todd, M., Romano, J. M., Ghosh, N., Keefe, F. J., ... & Porter, L. S. (2020). Attachment style, partner communication, and physical well-being among couples coping with cancer. *Personal Relationships, 27*(3), 526-549. https://doi.org/10.1111/pere.12330

Ratcliff, C. L. (2019). Characterizing reactance in communication research: A review of conceptual and operational Approaches. *Communication Research,* 1-26. https://doi.org/10.1177/0093650219872126

Reynolds-Tylus, T., Bigsby, E., & Quick, B. L. (2020). A comparison of three approaches for measuring negative cognitions for psychological reactance. *Communication Methods and Measures,* 1-17. https://doi.org/10.1080/19312458.2020.1810647

Romo, L. K. (2018). An examination of how people who have lost weight communicatively negotiate interpersonal challenges to weight management. *Health Communication, 33,* 469-477. https:/doi.org/10.1080/10410236.2016.1278497

Shebib, S. J., Holmstrom, A. J., Summers, M. E., Clare, D. D., Reynolds, R. M., Poland, T. L., Royer, H. R., Mazur, A. P., & Moore, S. (2020). Two experiments testing order, interaction, and absolute effects of esteem support messages directed toward job seekers. *Communication Research, 47*(4), 541–571. https://doi.org/10.1177/0093650219831813

Sieverding, M., Specht, N. K., & Agines, S. G. (2019). “Don’t drink too much!” Reactance among young men following health-related social control. *American Journal of Men's Health, 13*(1). https://doi.org/10.1177/1557988319825921

Smith, S. W., Cornacchione, J. J., Morash, M., Kashy, D., & Cobbina, J. (2016). Communication style as an antecedent to reactance, self-efficacy, and restoration of freedom for drug-and alcohol-involved women on probation and parole. *Journal of Health Communication, 21*(5), 504-511. https://doi.org/10.1080/10810730.2015.1103329

Tian, X., Solomon, D. H., & Brisini, K. S. C. (2020). How the comforting process fails: Psychological reactance to support messages. *Journal of Communication, 70*(1), 13-34.

Tucker, J. S., & Anders, S. L. (2001). Social control of health behaviors in marriage. *Journal of Applied Social Psychology, 31*(3), 467-485. https://doi.org/10.1111/j.1559-1816.2001.tb02051.x

Wilcox, S., Dorrance Hall, E., Holmstrom, A. J., & Schmälzle, R. (2020). The emerging frontier of interpersonal communication and neuroscience: Scanning the social synapse. *Annals of the International Communication Association, 44*(4), 368-384. https://doi.org/10.1080/23808985.2020.1843366

Worchel, S., & Brehm, J. W. (1970). Effect of threats to attitudinal freedom as a function of agreement with the communicator. *Journal of Personality and Social Psychology, 14*(1), 18–22. https://doi.org/10.1037/h0028620

Worobey, J. (2002). Early family mealtime experiences and eating attitudes in normal weight, underweight and overweight females. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 7*(1), 39-44. https://doi.org/10.1007/bf03354428

Yan, C., Dillard, J. P., & Shen, F. (2010). The effects of mood, message framing, and behavioral advocacy on persuasion. *Journal of Communication*, *60*(2), 344-363. https://doi.org/10.1111/j.1460-2466.2010.01485.x

Zhang, Q., & Sapp, D. A. (2013). Psychological reactance and resistance intention in the classroom: Effects of perceived request politeness and legitimacy, relationship distance, and teacher credibility. *Communication Education*, *62*(1), 1-25. https://doi.org/10.1080/03634523.2012.727008

Table 1

Rating guide for face threat and FMSs in messages

Rating	Message Content	Example(s)	Observed Overall Frequency
Negative face threat			
4	Threats from partner to participant accompanied with strong negative emotions (e.g., yelling, eye-rolling) and/or statements phrased as direct threats or orders to the participant.	"Partner: *You* can't just eat kale salad"* "Participant: I am going to get one more cookie before the main event. Partner: She said quite angrily, "NO!!!" and rolled her eyes."	10.1%
3	Statements made by partner to participant that indirectly pressure them to take specific actions. Statements that are attempts to sabotage participants' progress toward a goal. Includes statements that convey mild negative emotion, and/or orders directed at the couple (i.e., making demands in the form of "we order(s)")	"Partner: *We* should eat something healthier"* "Participant: I explained to her what I had for meals during my recent 3-day hunting trip away from town. Partner: I'm *not impressed* by the food you ate, no variety and too much meat."*	17.4%
2	Specific requests from partner to participant or partner giving unsolicited advice to participant.	"Partner: I recommend taking a couple of apples and a banana for those meals at work." "Partner: I need to eat more food as I had too few calories today. What do you want to eat for dinner? Participant: I don't care. What about pizza? Partner: We should eat something healthier."	14.0%
1	The partner gives solicited advice or indirectly attempts to persuade the participant.	"Participant: What should we do for dinner tomorrow? Partner: We could do chicken in the crock pot."	14.0%

Rating	Message Content	Example(s)	Observed Overall Frequency
0	No instances of negative face threat to the participant.	"Participant: My partner said he liked the yogurt sauce with avocado, lemon juice, chia seeds and garlic."	44.4%
Positive face threat			
4	Statements made by a partner that convey disapproval, criticism, violent emotions, accusations, or challenges directed at the *participant*.	"Participant: I am going to get one more cookie before the main event. Partner: She said quite angrily, "NO!!!" and rolled her eyes." "Partner: So, is that Hersheys bar a new part of *your* eating better diet? *You* just murdered your whole week."*	6.7%
3	Dismissive statements from a partner when participants express their goals, desired actions, or personal beliefs. Statements made by a partner that convey disapproval, criticism, violent emotions, accusations, or challenges directed at the *couple*.	"Partner: *We* don't do anything active anymore, it's not good."* "Partner: I feel so fat. Participant: Me too. Partner: No, you're not. Participant: Yea I am. I don't want to be. Partner: I feel like we keep talking about being healthier, but stuff keeps getting in the way."	2.8%
2	A partner blatantly refusing to cooperate in joint activities, expressing explicit irreverence, and/or general disagreement with the participant's wants/actions.	"Participant: Can we workout using my Zumba mobile application for more than an hour? Partner: I dislike Zumba."	12.9%

Rating	Message Content	Example(s)	Observed Overall Frequency
1	A partner offers advice/suggestions or makes a request of the participant that implies something is wrong with the participant or that the partner knows better.	"Partner: We need to make goals for our eating, exercising, and mental health. Participant: OK Partner: I think it will be easier to maintain if we have goals to track our progress…"	27.0%
0	No instances of positive face threat to the participant.	"Partner: I am worried about my physical next week. Participant: I'm sorry. I feel like I let you down. Partner: You didn't let me down. You don't have any control over me or what I do. This is my fault"	50.6%
Negative FMSs			
4	Partner makes explicit statements that grant freedom for a participant to make their own choices.	"Participant: Thanks for the pie. It's delicious but I feel guilty eating it. Partner: Don't feel you have to eat."	5.1%
3	Partner makes statements with implied freedom granting or makes an unprompted offer to the participant that facilitates choices the participant wants to make.	"Participant: I have found a few good recipes for steam-cooking. Wanna check anything out tomorrow night? Partner: Sure, I will probably be able to help."	10.2%
2	Partner asks participant questions that provide participant multiple choices/options, or makes proposals that allow the participant leeway to say no.	"Partner: Would you rather jog or run first at the gym?"	24.3%
1	Partner hedges their directives for what the participant should/could do.	"Partner: We gotta remember to stop and get shampoo and conditioner on the way home, and some food too." Participant: Yeah."	6.8%
0	No instances of negative FMSs.	"Partner: I had a Chinese buffet for lunch."	53.7%

Rating	Message Content	Example(s)	Observed Overall Frequency
Positive FMSs			
4	Partner gives explicit, *specific* approval, praise, respect, compliments to the participant.	"Partner: You move your body in fabulous ways and your health is vibrant."	1.7%
3	Partner gives *generic* approval of the person and/or their behavior, or partners use "we" statements indicating approval of the couple	"Partner: You got this! I know you can do it."	6.7%
2	Partner shows approval, cooperation, active listening, care, or interest in their words or behaviors toward the participant.	"Partner: Then I will eat vegetarian with you.'"	23.6%
1	Partner uses language to smooth over conflict or disagreement with a participant and/or statements expressing simple, generic appreciation of participant.	"Participant: I feel like I'm just buying everything in the store that looks good to me I need to stop. Partner: We need groceries, it's fine."	20.2%
0	No instances of positive FMSs	We sat down at the table at red lobster. My husband ordered all you eat shrimp. Partner: Gosh I better choose healthy sides because this is a lot of food. Participant: You are going to have to do some extra exercise after eating that."	47.8%

Note. *Italicized text added by researchers to highlight key features used in coding decisions. Observed frequency indicates the percentage in which the code was present across entire dataset.

Table 2

Correlations, Means, and Standard Deviations for Reported Face Threat, Observed Face Threat, FMSs, Reactance, and Health Behaviors

	Mean	SD	1	2	3	4	5	6	7	8
1. Reported negative face threat	1.58	0.98								
2. Reported positive face threat	2.26	0.84	.70***							
3. Observed neg. face threat	1.35	1.44	.09	.14						
4. Observed positive face threat	0.88	1.16	.30***	.28***	.42***					
5. Negative FMS	1.06	1.28	.001	-.17**	.04	-.14				
6. Positive FMS	0.94	1.07	-.09	-.30***	.05	-.14	.28***			
7. Reactance	2.10	0.73	.50***	.57***	.01	.23***	-.13	-.33***		
8. Healthy eating	4.47	1.60	-.12	-.20***	.03	-.03	.04	.28***	-.55***	
9. Exercise	3.91	1.90	-.19***	-.22***	.04	.01	.14	.23***	-.43***	.35***

Note. $^{**}p < .01$, $^{***}p < .001$.

Table 3

Unconditional models for dependent variables

Model Parameters	*b*	SE	*p* <
Model for reactance	0.26	0.03	.001
Model fit			
ML -2LL	485		
ML AIC	489		
ML BIC	496		
Model for healthy eating	1.83	0.18	.001
Model fit			
ML -2LL	946		
ML AIC	950		
ML BIC	957		
Model for physical activity	2.16	0.27	.001
Model fit			
ML -2LL	999		
ML AIC	1,003		
ML BIC	1,010		

Note. Coefficients are unstandardized, models are best fitting.

Table 4

Mixed level models with random intercepts presented for perceived (H1a) and observed (H1b) negative face threat (H1a), and perceived (H2a) and observed (H2b) positive face threat on reactance.

Model Parameters	*b*	SE	*p* <
Model for H1a			
Random intercept variance	0.22	0.06	.001
Residual variance	0.23	0.03	.001
Fixed effects			
Intercept	1.61	0.12	.001
Time	0.02	0.01	.074
Negative face threat (perceived)	0.26	0.05	.001
Model fit			
ML -2LL	371		
ML AIC	375		
ML BIC	382		
Model for H1b			
Random intercept variance	0.28	0.03	.001
Residual variance	0.21	0.08	.001
Fixed effects			
Intercept	2.03	0.11	.001
Time	0.02	0.01	.19
Negative face threat (observed)	-0.02	0.03	.52
Model fit			
ML -2LL	319		
ML AIC	323		
ML BIC	329		
Model for H2a			
Random intercept variance	0.21	0.05	.001
Residual variance	0.18	0.02	.001
Fixed effects			
Intercept	1.09	0.14	.001
Time	0.01	0.01	.27
Positive face threat (perceived)	0.43	0.05	.001
Model fit	333		
ML -2LL	338		
ML AIC	345		
ML BIC			
Model for H2b			
Random intercept variance	0.21	0.03	.001

Model Parameters	*b*	SE	*p* <
Residual variance	0.26	0.07	.001
Fixed effects			
Intercept	1.94	0.1	.001
Time	0.01	0.01	.27
Positive face threat (observed)	0.09	0.04	.01
Model fit			
ML -2LL	312		
ML AIC	316		
ML BIC	323		

Note: Coefficients are unstandardized, models are best fitting.

Table 5

Mixed level models with random intercepts presented for negative (H3) and positive (H4) FMSs on reactance.

Model Parameters	*b*	SE	*p* <
Random intercept variance	0.30	0.08	.001
Residual variance	0.20	0.03	.001
Fixed effects			
Intercept	2.11	0.11	.001
Time	0.01	0.01	.26
Negative politeness	-0.08	0.03	.01
Model fit			
ML -2LL	313		
ML AIC	317		
ML BIC	323		
Model for H4			
Random intercept variance	0.24	0.07	.001
Residual variance	0.20	0.03	.001
Fixed effects			
Intercept	2.15	0.10	.001
Time	0.02	0.01	.21
Positive politeness	-0.15	0.03	.001
Model fit			
ML -2LL	305		
ML AIC	309		
ML BIC	316		

Note. Coefficients are unstandardized, models are best fitting.

Table 6

Mixed level models with random intercepts presented for interaction effects on reactance (RQ1).

Reported	Negative FMS	Positive FMS
	b (SE)	*b* (SE)
Negative face threat	.02 (.04)	-0.07 (.05)
Positive face threat	.03 (.04)	.02 (.06)
Observed		
Negative face threat	.03 (.02)	-.03 (.03)
Positive face threat	.01 (.03)	.01 (.03)

Note. Table depicts the unstandardized coefficients and standard errors of the interaction between variables (face threat and FMS) used as predictors on reactance in best fitting model. No significant interactions were found.

Table 7

Mixed level models with random intercepts presented for reactance on healthy eating (H5a) and reactance on physical activity (H5b).

Model Parameters	*b*	SE	*p* <
Model for H5a			
Random intercept variance	0.5	0.14	.001
Residual variance	1.42	0.14	.001
Fixed effects			
Intercept	6.82	0.30	.001
Time	0.04	0.04	.13
Reactance	-1.23	0.12	.001
Model fit			
ML -2LL	871		
ML AIC	875		
ML BIC	882		
Model for H5b			
Random intercept variance	1.22	0.32	.001
Residual variance	1.75	0.18	.001
Fixed effects			
Intercept	5.98	0.39	.001
Time	0.05	0.03	.064
Reactance	-1.18	0.16	.001
Model fit			
ML -2LL	953		
ML AIC	957		
ML BIC	964		

Note. Coefficients are unstandardized, models are best fitting.