The Interpersonal Process Model of Demand/Withdraw Behavior

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This manuscript was supported in part by start-up funding from the University of Utah awarded to Brian Baucom and by grants from the Deutsche Forschungsgemeinschaft (DFG; DFG Fe 263/5-1, Ha 1400/4-1 and Ha 1400/16-1) awarded to Kurt Hahlweg.

The authors would like to thank Katherine J.W. Baucom, Ph.D. and the members of the Close Relationships Interest Group at the University of Utah for their helpful comments and feedback on earlier versions of this manuscript.

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http://dx.doi.org/10.1037/fam0000044
Abstract

The demand/withdraw interaction pattern is a destructive cycle of relationship communication behavior that is associated with negative individual and relationship outcomes. Demand/withdraw behavior is thought to be strongly linked to partners’ emotional reactions, but current theories are inconsistent with empirical findings. The current study proposes the interpersonal process model of demand/withdraw behavior which includes linkages between each partners' emotional reactions and the interpersonal behavior of demanding and withdrawing. Data come from problem solving discussions of 55 German couples with observationally coded demand/withdraw behavior and fundamental frequency [$f_0$] to measure vocally encoded emotional arousal. Actor-Partner Interdependence Models (Kenny, Kashy, & Cook, 2007) were used to examine associations among demand/withdraw behavior and $f_0$ in the overall discussion and 5-minute segments. Significant cross-partner associations emerged for demanding and withdrawing behavior across the whole conversation as well as within 5-minute segments, and these associations are partially accounted for by each individual’s $f_0$. When behaviorally coded demanders expressed more vocal arousal, they demanded more and withdrew less while their partners withdrew more. In contrast, when behaviorally coded withdrawers expressed more vocal arousal, their partners demanded less and withdrew more. Findings demonstrate that demand/withdraw behavior varies between couples (i.e., some couples engage in a stronger demand/withdraw cycle than others) and between segments (i.e., when one partner increases demanding, the other increases withdrawing). Findings support key elements of the interpersonal process model, showing intra- and interpersonal pathways linking demand/withdraw behavior and emotion and demonstrate the importance of partners' behavioral roles in these linkages.

Keywords: demand/withdraw behavior, emotion, multilevel structural equation model
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The demand/withdraw interaction pattern is a dysfunctional cycle of behavior that is highly prevalent during relationship conflict in distressed romantic relationships (see Eldridge & Baucom, 2012 for a review). It occurs when one partner, the demander, nags, criticizes, or complains while seeking a change in the relationship and the other partner, the withdrawer, avoids discussion of change, changes the subject of conversation, or refuses to respond all together (Christensen, 1987). A large body of theory and research is devoted to uncovering factors associated with demand/withdraw behavior, and one line of research focuses specifically on associations between conflict-related emotional arousal and demand/withdraw behavior. Work on demand/withdraw behavior and emotional arousal has been guided primarily by the escape-conditioning model (Gottman & Levenson, 1988), which proposes that the key driver of demand/withdraw behavior is the emotional arousal of the withdrawing individual. However, this model largely ignores the demander’s arousal, as well as the within and between partner associations common in couple conflict. The current study proposes an interpersonal process model that includes pathways between emotional arousal, withdrawing behavior, and demanding behavior and tests the model during the problem-solving interactions of 55 German couples.

Demand/withdraw behavior

Demand/withdraw behavior is associated with a wide range of negative individual and relational sequelae. More specifically, higher levels of demand/withdraw behavior co-occur with highly destructive and damaging relationship behaviors, such as intimate partner violence (Holtzworth-Munroe, Smutzler, & Stuart, 1998) and infidelity (Balderrama-Durbin, Allen, & Rhoades, 2012). In addition, demand/withdraw patterns are associated with longitudinal declines in relationship satisfaction (e.g., Heavey, Christensen, & Malamuth, 1995), as well as being
associated with a range of negative physical and mental health outcomes (e.g., alcoholism, decreased well-being, and increased depressive symptoms; Kelly, Halford, & Young, 2002; Milbury & Badr, 2012; Rehman, Ginting, Karimiha, & Goodnight, 2010; Siffert & Schwartz, 2011). Moreover, this is a common pattern of relationship interaction within couples seeking therapy and often a focus of therapy (e.g., Eldridge, Sevier, Jones, Atkins, & Christensen, 2007; Johnson & Zuccarini, 2011; Wile, 2012). Finally, a growing body of research finds demand/withdraw behavior to be prevalent in distressed couples in numerous countries and cultures including Argentina (Falconier & Epstein, 2011), Australia (Noller, Feeney, Bonnell, & Callan, 1994), Belgium (Verhofstadt, Buysee, Ickes, de Clercq, & Penne, 2005), Brazil, Italy, and Taiwan (Christensen, Eldridge, Catta-Preta, Lim, & Santagata, 2006), Germany and Switzerland (Bodenmann, Kaiser, Hahlweg, & Fehm-Wolsdorf, 1998), the Netherlands (Kluwer, Heesink, & Van de Vliert, 2000), Pakistan (Rehman & Holtzworth-Munroe, 2006), and the United States (e.g., Christensen & Heavey, 1990), demonstrating the widespread nature of the behavioral cycle.

One enduring aim of research on demand/withdraw behavior is to understand why some partners take on a demanding role and others take on a withdrawing role. In heterosexual relationships, women demand more than men, and men withdraw more than women, particularly when discussing an area of relationship change identified by a female partner (e.g., Baucom, McFarland, & Christensen, 2010; Christensen & Heavey, 1990). One explanation for this sex difference comes from the escape conditioning model. The escape-conditioning model suggests that men withdraw because they are more sensitive to relationship conflict than women, experience high levels of aversive emotional arousal during relationship conflict, and withdraw to reduce their aversive arousal (Gottman & Levenson, 1988). Initial support for this model came from evidence that men show stronger physiological reactivity to naturally occurring and
experimentally manipulated stressors than women (Gottman & Levenson, 1988).

However, subsequent empirical support for the escape conditioning model has been mixed. Some studies find women, rather than men, to be more physiologically reactive to relationship conflict (e.g., Kiecolt-Glaser, Newton, Cacioppo, MacCallum, Glaser, & Malarkey, 1996). Additionally, most studies that directly examine emotional arousal and demand/withdraw behavior fail to find the hypothesized association between higher levels of an individual’s own emotional arousal and higher levels of his/her own withdrawing behavior (Baucom et al., 2011; Denton, 2001; Kiecolt-Glaser, Bane, Glaser, & Malarkey, 2003; Kiecolt-Glaser et al., 1996; Loving, Heffner, Kiecolt-Glaser, Glaser, & Malarkey, 2004; Vogel et al., 2008). An exception to this pattern of findings comes from the work of Verhofstadt and colleagues (Verhofstadt et al., 2005), who find higher levels of self-reported arousal to be associated with higher levels of withdrawing behavior for women. However, this study also finds higher levels of self-reported emotional arousal to be associated with lower levels of withdrawing behavior for men.

Despite this inconsistent empirical evidence, the notion that demand/withdraw behavior and emotional arousal are tightly linked for withdrawing partners continues to figure prominently in empirical investigations, clinical case studies, and couple therapy manuals (e.g., Wile, 2013). A number of explanations could be offered for the inconsistency in anecdotal and empirical evidence, such as reduced ecological validity of laboratory based observational research (e.g., Heyman, 2001) or misinterpretation of processes observed during psychotherapy sessions (e.g., Nickerson, 1998). The escape-conditioning model fundamentally focuses on the within-person association of an individual’s arousal and that same person’s behavior (i.e., increased arousal leads to increased withdrawing). However, this ignores the dynamic interplay of partners within a conflictual interaction. How might partners’ arousal and mutual demand/withdraw behaviors
Influence one another within the broad network of interpersonal and intrapersonal associations?

**Intra- and interpersonal linkages in emotional arousal and demand/withdraw behavior**

The defining feature of the escape-conditioning model is that withdrawers withdraw because they experience relationship conflict as intensely aversive. This idea was originally proposed as an intrapersonal process with little regard given to the role of a demander’s behavior or accompanying emotional arousal. Polarization theory and existing findings suggest that emotional arousal and demand/withdraw behavior may influence one another through a combination of intrapersonal and interpersonal pathways.

Polarization theory (e.g., Baucom et al., 2010; Jacobson & Christensen, 1996) describes demand/withdraw behavior as a cyclical pattern of interaction in which each partner’s behavior occurs as a result of, and serves as a precipitant for, the other partner’s behavior. Demanders demand both because they want some kind of change and because their partner is withdrawing, and withdrawers withdraw both because they want to preserve the status quo and because their partner is demanding. Polarization occurs when both partner’s behavior becomes more extreme over time as they intensify their behavior in response to previously unsuccessful attempts to resolve conflict. For example, if a demanding partner is unsuccessful in obtaining a desired change, s/he often makes an even stronger demand for that same change in the future. The withdrawing partner may respond in kind with stronger resistance to the intensified demand, and the cycle is set on a path of continued escalation.

The polarization process is also thought to extend to both partner’s emotional reactions during demand/withdraw interaction. Although both partners are likely to experience the demand/withdraw cycle as frustrating and aversive, the polarization process is likely to contribute to increased emotional reactivity for demanding spouses more so than for withdrawing
spouses. One reason that this effect is likely to occur is that demanding spouses likely need high levels of motivation to continue to pursue change when they have been repeatedly rebuffed and previous conversations about the desired change have been highly aversive. Higher levels of a demander’s demanding behavior are therefore likely to coincide with higher levels of that partner’s own emotional arousal. Higher levels of a demander’s emotional arousal are also likely to be related to higher levels of a withdrawing partner’s withdrawing behavior, because the withdrawing partner likely experiences the demanding partner’s increased level of emotional arousal as increased emotional pressure for change and increases the intensity of his/her resistance in kind. When this resistance takes the form of withdrawing behavior, it is likely to co-occur with emotional withdrawal as indicated by decreased levels of emotional arousal. Demanders likely experience decreases in withdrawers’ emotional arousal as indications that withdrawers are not willing to actively engage in the discussion and intensify their demanding behaviors accordingly. Thus, the polarization process involves increasing emotional arousal from the demander in conjunction with decreased emotional arousal from the withdrawer.

Existing empirical evidence provides initial support for intrapersonal and interpersonal pathways linking both partners’ demand/withdraw behavior to their own and their partner’s emotional arousal. For example, several studies link higher levels of an individual’s own emotional arousal to higher levels of his/her own demanding behavior (e.g., Baucom et al., 2011; Verhofstadt et al., 2005). Additionally, two studies find that higher levels of an individual’s withdrawing behavior are linked to higher levels of the other partner’s emotional arousal (Heffner et al., 2006; Kiecolt-Glaser et al., 1996). Finally, there is some evidence that emotional arousal is linked to both partners’ behaviors rather than to either in isolation. For example, Denton (2001) found that demanding husbands are significantly more physiologically aroused
when interacting with withdrawing wives than when interacting with demanding wives.

**Implications of different modalities of emotional arousal for demand/withdraw behavior**

Links between demand/withdraw behavior and emotional arousal have been examined using physiological indices (e.g., Kiecolt-Glaser, Bane, Glaser, & Malarkey, 2003), subjective reports (e.g., Verhofstadt et al., 2005), and vocally encoded emotional arousal (e.g., Baucom et al., 2011). These different approaches to assessing emotional arousal have differential utility for evaluating a model that includes intrapersonal and interpersonal pathways between emotion and demand/withdraw behavior. Of these three methods, measures of vocally encoded emotional arousal have particular appeal because they are related to partners’ unobservable, internal emotional states (physiological activation [e.g., Weusthoff, Baucom, & Hahlweg, 2013a] and subjective experience [e.g., Baucom et al., 2012]), and they communicate information about those internal emotional states to the other partner. These qualities make vocally encoded emotional arousal an advantageous candidate for examining both intrapersonal and interpersonal pathways linking demand/withdraw behavior and emotional arousal.

An additional benefit of vocally encoded emotional arousal is that it changes rapidly and can be measured at a high level of precision without the need for invasive equipment. This quality is beneficial because it permits examination of linkages between demand/withdraw behavior and emotional arousal on both a short-term and a long-term basis. Existing work has focused on examining associations on a long-term basis in testing whether the total amount of demand/withdraw behavior during conflict is related to the total amount of arousal during conflict. In addition to this overall association, it is also possible that demand/withdraw behavior and emotional arousal could fluctuate with one another as conflict unfolds (e.g., Wile, 2013). It may be that periods of particularly intense demand/withdraw behavior are associated with
particularly intense emotional arousal independent of how much overall demand/withdraw behavior a couple engages in and how aroused spouses are over the whole of the discussion.

**Hypotheses**

The current study proposes the interpersonal process model of demand/withdraw behavior as a framework for integrating existing findings with polarization theory. The model (depicted in Figure 1) includes intrapersonal and interpersonal linkages between partners’ behavior and emotional arousal. This proposed model is tested by examining intrapersonal and interpersonal pathways between vocally encoded emotional arousal and demand/withdraw behavior on both a short-term and a long-term basis during relationship conflict. Paths between emotional arousal and demand/withdraw behavior and covariances among emotional arousal and among demand/withdraw behavior are hypothesized to be consistent with those depicted in Figure 1. With regard to associations between emotional arousal and demand/withdraw behavior, higher levels of each partner’s *own* emotional arousal are hypothesized to be associated with higher levels of the partner’s *own* demanding, lower levels of the partner’s *own* withdrawing, higher levels of the *other partner’s* withdrawing, and lower levels of the *other partner’s* demanding. With regard to associations between partners’ demanding and withdrawing behaviors, higher levels of a partner’s demanding are hypothesized to covary with lower levels of that partner’s *own* withdrawing, higher levels of the *other partner’s* withdrawing, and lower levels of the *other partner’s* demanding. Finally, partners’ levels of emotional arousal are hypothesized to co-vary negatively. These associations are hypothesized to emerge within 5-minute segments as well as over the entirety of a problem solving discussion.

**Methods**

**Participants**
Participants \((N = 55 \text{ couples})\) are a subsample of 65 couples recruited for participation in an efficacy trial of a cognitive behavioral, relationship distress prevention seminar, Ein partnerschaftliches Lernprogramm (EPL; Hahlweg, Markman, Thurmaier, Engl, & Eckert, 1998). Couples were randomly assigned either to EPL or a waitlist control condition. See Kaiser, Hahlweg, Fehm-Wolfsdorf, and Groth (1998) for additional details about recruitment and EPL.

All couples in this study had been dating at least one year. Approximately 77.5 % of couples were married for an average of 11.2 years \((SD = 10.7 \text{ years, range } = 1 – 40 \text{ years})\). Couples’ relationship quality, as assessed by the Partnerschaftsfragebogen (Hahlweg, 1996), ranged from non-distressed to severely distressed with the majority of couples indicating current relationship distress \((M = 46.7, SD = 12.9)\). All couples were opposite-sex couples. Women were between the ages of 24 and 63 years \((M = 39.5, SD = 8.4)\), and men were between the ages of 25 and 67 \((M = 42.1, SD = 9.0)\). All participants identified as Caucasian, and 60% of participants had at least high school equivalent education.

**Procedures**

Interested couples responded to a newspaper announcement for a communication seminar for couples who wanted to learn more effective ways to communicate and to solve problems in their relationships. The advertisement made clear that the seminar was intended to assist couples prior to the development of significant relationship problems and was not intended to be marital therapy. All couples completed an identical laboratory assessment that included a battery of self-report questionnaires and a 15-minute problem-solving discussion about a self-selected area of relationship distress. Couples assigned to the EPL condition completed this assessment prior to receiving the program. The topics for the problem solving discussions were jointly selected and agreed on by both spouses. First, both spouses identified areas of actual concern by
independently completing a problem list questionnaire. Spouses then selected a topic for discussion that was highly rated on both of their lists and that both were willing to discuss. Spouses were instructed to share their thoughts and feelings about the selected topic for the full 15 minutes and were aware that the problem-solving discussions would be videotaped. Measures of $f_0$ and observationally coded demanding and withdrawing behavior were obtained from these recorded interactions. The study protocol was approved by the ethics committee of the Deutsche Gesellschaft fuer Psychologie (DGPs, German Society of Psychology).

**Measures**

**Vocally encoded emotional arousal.** Mean fundamental frequency ($f_0$) was used as the measure of vocally encoded arousal. $f_0$ refers to the lowest frequency harmonic of the speech sound wave and is highly correlated with perceived pitch. Higher $f_0$ corresponds to higher perceived pitch and is indicative of higher emotional arousal (e.g., Juslin & Scherer, 2005).

Consistent with existing findings of small to moderate associations between other forms of emotional expression (i.e., facial expression), physiology, and subjective emotion (e.g., Bradley & Lang, 2000), higher $f_0$ is moderately associated with higher levels of physiological activation (heart rate, systolic blood pressure, skin conductance, and cortisol output) and greater self-reported negative emotion during couple and family conflict (Baucom et al., 2012; Weusthoff et al., 2013a). This operationalization of emotional arousal draws on component process (e.g., Scherer, 1982) and circumplex (e.g., Bradley & Lang, 1994) models of emotion. In these models, emotion is understood to vary along the continuous dimensions of valence, which refers to how positive vs. negative an emotion is, arousal, and dominance, which refers to how dominant vs. submissive an emotion is. These models suggest that particular combinations of the three dimensions correspond to different specific emotions. For example, anger would be
reflected by high negative valence, high arousal, and high dominance. In contrast, sadness would be reflected by high negative valence, low arousal, and low dominance.

Mean $f_0$ was measured continuously for each member of the couple during the problem solving discussions by bandpass filtering the audio recordings to restrict $f_0$ values to the normal range of adult speech (between 75 and 300 Hz; Juslin & Scherer, 2005). Mean $f_0$ values outside of this range were assumed to be the result of non-verbal vocalizations (e.g., coughing) or background noise of various kinds. The recordings of ten couples contained a large amount of background noise, were of poor quality (i.e., sound-to-noise ratio of less than 5 db), or both. Reliable estimates of mean $f_0$ could not be obtained from these recordings and these recordings were therefore excluded from analyses. Mean $f_0$ values were calculated for each partner by averaging mean $f_0$ over each 5-minute segment of the problem solving discussion. Mean $f_0$ values were divided by 30 prior to analysis to prevent ill-scaling (Kline, 2011). Higher mean $f_0$ values indicated higher levels of emotionally encoded arousal.

**Observed communication.** Demand and withdraw behaviors during the problem solving discussions were coded using an adapted version of the Couples Interaction Rating System, 2nd Edition (CIRS-2; Heavey, Gill, & Christensen, 2002). The CIRS-2 contains two codes for demanding behavior (blames and pressures for change) and three codes for withdrawing behavior (withdraws, avoidance, and reverse scored discussion); the current study used both demanding behavior codes and the two withdrawing behavior codes that directly assess withdrawing behavior (withdraws and avoidance). Separate demanding and withdrawing scores were obtained for each partner for each 5-minute segment by averaging each partner’s codes for each 5-minute segment. Behaviors were coded in 5-minute segments in order to allow for maximum time within each segment while also breaking discussions into enough segments
to generate estimates of within-couple behavior. There were a small number of outliers \((n = 5\) scores) for husband withdraw (1 score), wife withdraw (3 scores), and husband demand (1 score) that were more than 3 standard deviations above the mean of each respective scale; these scores were winsorized to be equal to the next largest score. Twenty-two percent \((n = 12\) couples) of problem solving discussions were double-coded to establish inter-rater reliability. Cronbach alpha was 0.96 for demanding behaviors and 0.72 for withdraw behavior at the between-couple level and 0.91 for demanding behaviors and 0.69 for withdraw behavior at the within-couple level. Higher scores indicate higher levels of the behavior.

Analysis Plan

The research questions in the current investigation focus on how emotional arousal measured by \(f_0\) is associated with demand/withdraw behaviors, including both partners’ data and allowing for cross-partner associations. In addition, each partner has three repeated measures corresponding to consecutive 5-minute portions of the problem solving discussion. To incorporate these aspects of the data, hypotheses were tested using repeated measures Actor-Partner Interdependence Models (APIM; Kenny et al., 2006) fit via Multilevel Structural Equation Modeling (MSEM) in MPLUS version 6 (Muthén & Muthén, 1998-2011). Four dependent variables (husband’s withdrawing behavior, husband’s demanding behavior, wife’s withdrawing behavior, and wife’s demanding behavior) were modeled as a function of his or her own \(f_0\) (actor effect) and his or her partner’s \(f_0\) (partner effect; see Figure 2). In addition, between and within-couple models were specified, corresponding to couple-average associations and within-couple associations. An initial, baseline model was run to examine covariances between partners’ behavior and between partners’ vocally encoded emotional arousal in isolation (i.e., without paths from vocally encoded emotional arousal to demand/withdraw behavior). This
model allows for examination of the hypothesized interpersonal processes within vocally encoded emotional arousal and demand/withdraw behavior, separately. A full model (the final model) was then run that included the covariances from the baseline model plus the addition of all actor and partner paths from vocally encoded emotional arousal to demand/withdraw behavior. Sensitivity analyses were run to ensure that within-couple associations were not influenced by growth over time in husband and wife f_0. Procedures recommended in Curran and Bauer (2011) were used to linearly detrend husband and wife f_0, and the baseline and final models were rerun using detrended values of f_0. Results were highly consistent with those obtained using non-detrended values of f_0 and are available from the first author.

Results

Table 1 presents means, standard deviations, and correlations between study variables. Between-partner correlations are below the diagonal and within-partner correlations are above the diagonal. As expected from biological differences in anatomy, mean f_0 is higher for women than men. Consistent with prior research on demand/withdraw behavior, positive correlations emerged between one partner’s demanding and the other partner’s withdrawing at both between- and within-couple levels. In addition, higher wife mean f_0 was correlated with wife demanding and husband withdrawing behaviors in hypothesized directions, and higher wife mean f_0 was correlated with higher husband mean f_0 at the within-partner level.

Baseline model

Figure 2 displays the full repeated measures APIM that estimates actor and partner paths at the within- and between-couple levels. To arrive at this model, a baseline model was run that included covariance terms between demanding and withdrawing behaviors and between mean f_0; however, paths from f_0 to demanding and withdrawing behaviors were excluded at both within-
and between-couple levels in the baseline model. This model estimates associations within each domain (emotion and behavior) and replicates prior research examining polarization of demand/withdraw behavior (Baucom et al., 2011). Consistent with expectations, higher levels of wife demand were significantly associated with higher levels of husband withdraw \((B = 0.10, p = 0.045)\) at the within-couple level. Contrary to hypotheses, higher levels of wife mean \(f_0\) were associated with higher levels of husband mean \(f_0\) \((B = 0.012, p = 0.022)\) at the within-couple level. Similar findings emerged for demand/withdraw behavior at the between-couple level with significant associations between higher levels of wife demand and higher levels of husband withdraw \((B = 0.28, p = 0.035)\) and between higher levels of husband demand and higher levels of wife withdraw \((B = 0.17, p = 0.025)\). All other associations were non-significant.

**Final model: Within-couple level**

All paths and covariances from the full MSEM are found in Table 2, and significant paths are displayed in Figure 2. Addition of paths from mean \(f_0\) to demanding and withdrawing behaviors resulted in strong evidence of improved model fit relative to the baseline model. Sample-sized adjusted Bayesian Information Criteria (BIC\(_{SSA}\)) for the final model \((BIC_{SSA} = 1295.07)\) was 18.2 points lower than that for the baseline model \((BIC_{SSA} = 1313.20)\). Lower BIC values indicate better model fit, and differences of 10 points or more are considered to indicate strong evidence of better model fit in the model with the lower BIC relative to the model with the higher BIC (Raftery, 1995). Additionally, significant actor and partner associations emerged between mean \(f_0\), and demand/withdraw behavior and covariance terms between demanding and withdrawing behaviors that were significant in the baseline model were no longer significant. First examining paths from mean \(f_0\) to demand/withdraw behavior, wives’ demanding behavior was significantly related to their own and their partners’ mean \(f_0\). Specifically, higher values of
wives’ demanding behavior were associated with higher values of own mean $f_0$ and lower values of husbands’ mean $f_0$. This suggests that during segments when wives' vocally encoded emotional arousal was higher and husbands' vocally encoded emotional arousal was lower, wives engaged in more demanding behavior. Additionally, higher values of husbands’ withdrawing behavior were significantly associated with higher values of wives’ mean $f_0$, suggesting that during segments when wives’ vocally encoded emotional arousal was higher, husbands’ withdrawing behavior also was higher. Finally, higher values of wives’ withdrawing behavior were significantly associated with lower values of her own mean $f_0$ and higher values of husbands’ mean $f_0$.

Examining covariances, the covariance between husbands’ and wives’ mean $f_0$ remained significant, but the covariance between wife demand and husband withdraw was no longer significant. This change in significance suggests that the paths from mean $f_0$ partially account for the covariance between demanding and withdrawing behaviors. Additionally, the covariance between husband and wife withdrawing behavior emerged as significant; this covariance was not significant in the baseline model. All other paths and covariances were non-significant.

**Final model: Between-couple level**

At the between-couple level, all paths from mean $f_0$ to demand/withdraw behavior were non-significant and three covariances emerged as significant. Higher levels of wife demand were significantly associated with higher levels of husband withdraw; higher levels of husband demand were significantly associated with higher levels of wife withdraw; and, lower levels of husband demand were significantly associated with higher levels of wife demand.

**Post-hoc exploratory analyses**

To further interpret the results reported above in light of previous research on gender
differences in demand/withdraw behavior, we examined estimated intercepts at the between-couple level to see if the problem-solving discussion was characterized primarily by a wife demand/husband withdraw pattern or a husband demand/wife withdraw pattern. Significant differences between partners’ behaviors were tested by constraining the intercept for each behavior to be equal across partners and examining change in the chi-square value for the model using procedures recommended for multilevel SEM (e.g., Stapleton, 2006). Separate models were run to compare demanding behaviors and withdrawing behaviors. Results revealed wife demanding ($M = 2.56$, 95% CI [2.32, 2.81]) was significantly higher than husband demanding ($M = 1.89$, 95% CI [1.72, 2.05]; $\Delta \chi^2(1) = 15.34, p < .001$) and that husband withdrawing ($M = 1.45$, 95% CI [1.27, 1.62]) was significantly higher than wife withdrawing ($M = 1.26$, 95% CI [1.15, 1.38]; $\Delta \chi^2(1) = 5.28, p = .022$). These findings indicate that conversations were, on average, characterized by wives being in a demanding role and husbands being in a withdrawing role.

**Discussion**

This study presents and tests an interpersonal process model of demand/withdraw behavior and vocally expressed emotional arousal. When examined in isolation, partners’ demanding and withdrawing behaviors were related to one another both within the 5-minute segments as well as over the whole interaction, and partners’ vocally encoded arousal were linked within the 5-minute segments. When examined in combination, linkages emerged between partners’ vocally encoded arousal and demand/withdraw behavior within the 5-minute segments. These findings broadly support a model of demand/withdraw behavior wherein partners are responding to one another within a dyadic system, and intrapersonal arousal is both precursor and response to one’s partner. In addition, it strongly suggests that the escape-conditioning
model is too restrictive to fully characterize these associations. We situate these findings within the context of existing work and consider their implications for refining conceptual models of emotional arousal and demand/withdraw behavior.

**Dyadic behavioral and emotional processes in isolation**

The significant associations that emerged between one partner's demanding behavior and the other partner's withdrawing behavior are consistent with the proposed interpersonal process model of demand/withdraw behavior as well as with existing empirical work. In both the current study and in Baucom et al. (2011), higher levels of one partner's demanding were linked to higher levels of the other partner's withdrawing, and these effects emerged for both husbands and wives. The results of the current study extend those obtained by Baucom et al. (2011) in a sample of US couples by demonstrating that this polarized effect exists both on a segment-by-segment basis as well as over the conversation in a sample of German couples. Taken together, these findings suggest that the intensity of demand/withdraw behavior is a result both of behavior during a given part of a conversation (i.e., in segments when wives were particularly demanding, husbands were particularly withdrawing) as well as a difference between couples in how they handle conflict (i.e., some couples engage in higher overall levels of wife demand/husband withdraw regardless of how those behaviors vary across the course of the conversation). This is the first evidence that we are aware of that characterizes demand/withdraw behavior as both a process that plays out during interaction as well as a general style of interacting across the entire conversation that varies between couples.

The significant positive association between higher husband mean $f_0$ and higher wife mean $f_0$ was opposite of the hypothesized direction of the proposed interpersonal process model of demand/withdraw behavior. One possible explanation for this finding comes from work
examining fluctuations in speakers’ mean f0 during the course of a conversation. Several studies find that temporal variability in vocal variables, including mean f0, tends to be associated across speakers during interaction (e.g., Gregory, Webster, & Huang, 1993). During the interactions of strangers, stronger cross-speaker association in prosodic features is associated with positive outcomes like higher perceived ratings of quality of conversation (Gregory et al., 1993). However, the function of cross-speaker associations in emotional expression and experience are thought to vary depending on the interaction context (e.g., Randall, Post, Reed, & Butler, 2013), and it is likely that cross-partner association in mean f0 represents a different phenomenon within the context of conflictual interaction than during the interactions of strangers. One possibility is that both partners may show similar patterns of increases and decreases in arousal because they are responding to the same behavioral context. Segments of intense conflict may provoke similar increases in arousal for both partners whereas periods of relative calm may facilitate decreases in arousal for both partners. Another possibility is that the segment-by-segment linkage between partners’ vocally encoded arousal may reflect a pattern of reciprocal transmission of negative emotional arousal; that is, partners are responding to each other’s arousal and not only to the difficulty of the issue being discussed. This possibility is consistent with evidence documenting cross-partner transmission of negative emotion and emotional arousal based on self-reports and physiological measurements (e.g., Helm, Sbarra, & Ferrer, 2012; Levenson & Gottman, 1983).

**Dyadic behavioral and emotional processes in combination**

When considered jointly, vocally encoded emotional arousal and demand/withdraw behavior were associated with one another on a segment-by-segment basis in ways that were both consistent with hypotheses and that were unanticipated. Consistent with the hypothesis for demanding behavior, higher levels of wife vocally encoded arousal and lower levels of husband
vocally encoded arousal were associated with higher levels of wife demanding behavior. This finding adds further evidence to the collection of results linking higher levels of emotional arousal to higher levels of an individual’s own demanding behavior. Higher levels of wife vocally encoded arousal were also linked to lower levels of her own withdrawing behavior and to higher levels of husband withdrawing behavior, whereas higher levels of husband vocally encoded arousal were associated with lower levels of wife demanding behavior. Finally, the association between wife demand and husband withdraw was no longer significant when paths involving vocally encoded arousal were included. In summary, wives expressed more arousal during periods when they demanded more and withdrew less and their partners withdrew more; wives demanded more during periods when their partners expressed less arousal; wives withdrew more during periods when their partners expressed more arousal; and, segment-to-segment fluctuations in vocally encoded arousal partially accounted for segment-to-segment fluctuations in cross-partner associations in demand/withdraw behavior.

This collection of findings suggests that the periods of most intense wife demand/husband withdraw behavior were observed during segments when wives expressed particularly high levels of arousal and husbands expressed particularly low levels of arousal. More specifically, husband withdrawing behavior was linked only to his partner’s arousal. Considered within the broader behavioral and emotional context of the interaction, this finding suggests that husbands are sensitive to vocal cues that their wives are highly aroused and that they withdraw in response. In contrast, wife demanding and withdrawing behaviors were linked with both her own and her partner’s arousal. One possible interpretation of these associations is that when one partner is intently trying to engage the other in a discussion of a desired change and the other expresses a low level of emotional arousal and low behavioral engagement, the
initiating/demanding partner may increase her emotional intensity and demanding behavior as a means of conveying the importance of the discussion. These increases may lead to even greater emotional pressure on the withdrawing partner who appears to respond by expressing lower arousal and engaging stronger behavioral disengagement.

Importantly, these findings emerged only for wife demand/husband withdraw behavior and only at the within-couple level. Post hoc examination of mean levels of demanding and withdrawing behaviors across partners revealed that these conversations were characterized as wives demanding more than husbands and husbands withdrawing more than wives. Findings may have emerged with wife demand/husband withdraw because it was the main pattern of behavior in which couples engaged. The emergence of associations only at the within-couple level was contrary to hypotheses and suggests that emotional expression is most strongly linked with demand/withdraw behavior as a dynamic processes that unfolds over the course of a discussion rather than as a result of individual differences in emotional expression. However, these findings do not rule out the possibility of associations between individual differences in other components of emotional arousal. For example, it is possible that some individuals experience high levels of subjective arousal when the conversation as a whole is more conflictual regardless of how much variability there is in segment-to-segment demand/withdraw behavior. Such a possibility awaits examination in future research.

This collection of findings provides support for the main tenets of the interpersonal process model of demand/withdraw that distinguish it from the escape-conditioning model. Consistent with the interpersonal process model, these findings suggest that links between demand/withdraw behavior and emotion might be best conceptualized as a cyclical dyadic phenomenon in contrast to the escape-conditioning model’s intrapersonal emphasis on
withdrawers. Demanders likely engage in demanding behavior because they want some kind of change in the relationship, become upset and aroused while asking for that change, and see their partners behaviorally and emotionally pull away more when they, the demanders, increase the urgency of their expressions. Withdrawers likely engage in withdrawing behavior because they do not want to engage in a discussion about change, behaviorally and emotionally disengage from their partner when forced to talk about change, and see their partners respond to their disengagement by increasing the intensity of the discussion. Phrased differently, demanders push harder for change not just because they are upset but also because their partners pull away; withdrawers pull away not only because they do not want to consider change but also because their partners are so adamant that they do so.

These results also add specificity to the nature of the associations between emotional arousal and demand/withdraw behavior within the proposed interpersonal process model. First, these findings provide initial evidence that associations between demand/withdraw behavior and expressions of emotional arousal occur on a segment-by-segment basis rather than as a result of stable individual differences in emotional expression. Second, these findings suggest that while withdrawing behavior is linked to emotional arousal, the nature of the association depends on whether a partner is in a demanding or a withdrawing role. Demanders engage in lower levels of withdrawing behavior when they themselves are more aroused, whereas withdrawers engage in higher levels of withdrawing behavior when their partners are more aroused. It is possible that these different paths emerged because of the use of an expressive measure of emotional arousal that conveys information about each partner’s emotional state to the other. However, it is also possible that they represent a more general phenomenon of both partners being more sensitive to the demanding partner’s level of emotional arousal.
Clinical Implications

The common principles approach to couple therapy (Christensen, 2010) suggests that interrupting and preventing emotionally-linked, maladaptive forms of communication behavior is one of the core principles shared among empirically supported couple therapies. The results of the current study add to the body of evidence documenting the demand/withdraw interaction pattern as one such pattern (see Eldridge & Baucom, 2012 for a review) and provide a new conceptualization for how emotional arousal and behavior are linked within this pattern. More specifically, the findings of the current study support a dyadic conceptualization of behavior and emotional arousal in the demand/withdraw interaction pattern. Caution is warranted in extending the findings of the current study to recommending intervention strategies given the correlational nature of the study. However, the findings of the current study suggest that it may be helpful for both partners to develop increased acceptance of and tolerance for the other’s emotional and behavioral reactions. Withdrawing partners would likely benefit from strategies for accepting that the issue their partners are raising is highly important to them and for staying engaged even in the face of heightened levels of arousal. Likewise, demanding partners would likely benefit from strategies that increase their ability to accept that their partners may feel less passionately about an issue that is very important to him/her and may be less invested in change and for continuing to discuss the issue without engaging in pressuring and blaming tactics. A number of couple therapies include intervention strategies for such purposes, such as empathic joining and tolerance building in IBCT (Jacobson & Christensen, 1996).

Limitations

There are several limitations to bear in mind when considering the results of the current study. First, only one measure of emotional arousal was examined, and it is therefore not possible
to know whether these findings are unique to vocally encoded emotional arousal or are representative of emotional arousal as expressed and experienced across emotion components. The small to moderate associations observed between vocally encoded arousal, physiological measures of emotional activation, and subjective reports of emotional experience make it difficult to extrapolate these findings to other modalities of emotional arousal (e.g., see Weusthoff, Baucom, & Hahlweg, 2013b for a recent review). It is also possible that different modalities of emotional arousal may interact in their association with demand/withdraw behavior. For example, it is well known that attempts to minimize or suppress emotional expression result in increased physiological arousal (Gross & John, 2003). It may be that withdrawers minimize emotional expression during periods of heightened physiological or subjective arousal, and examination of the relative contributions of and interactions between different components of emotional arousal would be a beneficial direction for future research.

Second, the use of 5-minute segments for quantifying demand/withdraw behavior and emotional arousal prevented examination of co-variation in rapid fluctuations of behavior and emotion. It is not currently known what the optimal time window is for assessing time-varying co-variation between demand/withdraw behavior and emotion or whether the selected time window of measurement impacts that co-variation. It is possible that demand/withdraw behavior and emotional arousal co-vary on a smaller time scale than was examined in the current study. For example, blaming behavior from one spouse could evoke a rapid emotional response from the other spouse. The results of the current study cannot be interpreted as providing empirical support for such a process. Rather, the current study provides initial evidence that the relative intensities of behaviors within a 5-minute segment are associated with relative intensities of emotional arousal within a 5-minute segment. Exploration of different time windows of
measurement would be a valuable direction for future research.

Third, the between-couple sample size \( n = 55 \) couples is smaller than what would be recommended by some published standards for SEM (e.g., Bentler & Chou, 1987). It is possible that the between-couple sample size contributed to the non-significant paths between \( f_0 \) and demand/withdraw behavior at the between-couple level. However, numerous authors have noted that smaller samples can be appropriate for SEM when a model has strong covariance terms and is relatively simple (e.g., Anderson & Gerbing, 1984); both of these conditions hold in the current study and mitigate against concerns about sample size at the between-couple level. Finally, all participants in this sample were German, in heterosexual relationships, and Caucasian, and these characteristics may limit generalizability. Such concerns are lessened by the consistency of findings reported in the current study and those reported in previous work that includes racial and ethnic minority participants from the United States (Baucom et al., 2012).

**Summary and future directions**

The findings of the current study provide support for the interpersonal process model of demand/withdraw behavior. They add to the body of research linking higher levels of demanding behavior to higher levels of an individual’s own emotional arousal and provide initial evidence that associations between withdrawing behavior and emotional arousal depend on a partner’s behavioral role. These findings are based on one component of emotional arousal, vocally encoded arousal. Future work on emotional arousal and demand/withdraw behavior would benefit from simultaneous examination of multiple components of emotional arousal to clarify the specificity of intra- and interpersonal pathways between emotion and behavior. Such work would also benefit from development of specific hypotheses for different components of emotional arousal. For example, it is possible that physiological and subjective components of
emotional arousal are associated with demand/withdraw behavior through mainly intrapersonal pathways when considered in the context of expressive components of emotional arousal. Future work would also likely benefit from including an expanded range of communication behaviors and modalities of emotional expression. For example, it would be valuable to examine associations between emotional arousal and demand/withdraw behavior while also considering verbal and facial emotional expression as well as general conflict behavior. Another valuable direction for future research would be to extend the interpersonal process model to attempt to explain between couple differences in demand/demand and demand/withdraw behavioral cycles. Incorporating additional emotional variables, such as the specific emotions with which emotional arousal is associated, would likely be helpful in such endeavors. For example, it is likely that demand/demand behavior occurs when both spouses experience approach oriented emotions such as anger and demand/withdraw occurs when the demanding spouse experiences an approach oriented emotion and the withdrawing spouse experiences an avoidant oriented emotion, such as irritation or anxiety (Baucom et al., 2012). Additionally, the findings of the current study provide cross-cultural replication and extension of work on vocally encoded arousal and demand/withdraw behavior (Baucom et al., 2012). Although both samples are from Western cultures, cross-cultural replication of observational findings in intimate relationship research has been rare and adds confidence to the generalizability of the findings in the current study. In sum, the interpersonal process model of demand/withdraw behavior provides a framework that integrates multiple components of emotional arousal, specifies intrapersonal and interpersonal linkages between behavior and emotion, and allows for variability in these linkages depending on partners’ specific behavioral roles. These qualities add both specificity and breadth to the nature of associations between demand/withdraw behavior and emotional arousal, and
detail a number of potential directions for future research.
References


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CA: Muthén & Muthén.


Table 1.

Means, Standard Deviations, and Correlations of Demand, Withdraw, and Fundamental Frequency (F₀).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1. Husband Demand</td>
<td>1.89 (.084)</td>
<td>1</td>
</tr>
<tr>
<td>2. Wife Demand</td>
<td>2.57 (1.11)</td>
<td>-.12</td>
</tr>
<tr>
<td>3. Husband Withdraw</td>
<td>1.45 (.76)</td>
<td>-.08</td>
</tr>
<tr>
<td>4. Wife Withdraw</td>
<td>1.27 (.53)</td>
<td>.63**</td>
</tr>
<tr>
<td>5. Husband F₀</td>
<td>126.30 (17.66)</td>
<td>.06</td>
</tr>
<tr>
<td>6. Wife F₀</td>
<td>206.22 (18.09)</td>
<td>.31*</td>
</tr>
</tbody>
</table>

Note: Means and correlations are based on raw data prior to winsorizing and rescaling. Within-partner correlations are denoted above the diagonal (n = 165), and between-partner correlations are denoted below the diagonal (n = 55). *p < .05, **p < .01
Table 2. Estimated paths and covariances for final repeated measures APIM model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Within-Partner</th>
<th>Between-Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>SE</td>
</tr>
<tr>
<td>Path</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife Demanding Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband $f_0$</td>
<td>-0.56*</td>
<td>0.25</td>
</tr>
<tr>
<td>Wife $f_0$</td>
<td>1.12***</td>
<td>0.29</td>
</tr>
<tr>
<td>Husband Withdrawal Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband $f_0$</td>
<td>-0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Wife $f_0$</td>
<td>0.53*</td>
<td>0.24</td>
</tr>
<tr>
<td>Husband Demanding Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband $f_0$</td>
<td>0.34</td>
<td>0.19</td>
</tr>
<tr>
<td>Wife $f_0$</td>
<td>0.29</td>
<td>0.18</td>
</tr>
<tr>
<td>Wife Withdrawal Behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband $f_0$</td>
<td>0.19*</td>
<td>0.09</td>
</tr>
<tr>
<td>Wife $f_0$</td>
<td>-0.25*</td>
<td>0.11</td>
</tr>
<tr>
<td>Covariance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wife Demand - Husband Withdraw</td>
<td>0.07</td>
<td>0.03</td>
</tr>
<tr>
<td>Wife Withdraw – Husband Demand</td>
<td>0.03</td>
<td>0.02</td>
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<tr>
<td>Wife Demand - Husband Demand</td>
<td>0.07</td>
<td>0.05</td>
</tr>
<tr>
<td>Wife Withdraw - Husband Withdraw</td>
<td>0.02*</td>
<td>0.01</td>
</tr>
<tr>
<td>Husband Demand - Husband Withdraw</td>
<td>-0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Wife Demand - Wife Withdraw</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Wife $f_0$ - Husband $f_0$</td>
<td>0.01*</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Note. Robust standard errors are reported; * $p < .05$, ** $p < .01$. 
Figure 1. Conceptual representation of the interpersonal model of demand/withdraw behavior. Hypothesized positive associations are represented by the + symbol, and hypothesized negative associations are represented by the – symbol.

Note. Demanding and withdrawing variables are grouped to illustrate demand/withdraw interaction patterns involving both partners.
Figure 2. Final repeated measures APIM model. Unstandardized path coefficients are reported, and parameter estimates are included only for significant paths to ease visual presentation.

Note. * $p < .05$, ** $p < .01$