

Chapter 4

Effects of Rumination and Observing Martial Conflict on Observers' Heart Rates as They Advise and Predict the Use of Conflict Tactics

**James M. Honeycutt, Shaughan A. Keaton,
Laura C. Hatcher and Dale Hample**

Conflict is common in ongoing relationships because partners have shared history and interdependence. Yet, bonding strengthens relationships such that partners can understand disapproval from one another and relationships can survive partner disagreements (Canary, Cupach, & Serpe, 2001). Gottman's (1994; 2011) extensive research involving 12 studies with more than 3,000 couples and another 4,000 couples in therapy has found that arguing does not predict the end of relationships; it is *how* couples argue (e.g., with contempt, sarcasm, or ridicule versus arguing with concern, empathy, and cooperative impulses) that predicts end of relationships.

Grych and Fincham (2001) have indicated that although married individuals are healthier on average than unmarried, marital conflict is associated

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with worse health and with specific illnesses such as cancer, cardiac disease, and chronic pain, perhaps because hostile behaviors during conflict are related to alterations in immunological, endocrine, and cardiovascular functioning. Physical aggression occurs in about 30% of married couples in the United States, leading to significant physical injury in about 10% of couples. Marriage is also the most common interpersonal context for homicide, and women are more likely to be murdered by their partners than by anyone else. Finally, marital conflict is associated with important family outcomes, including poor parenting, poor adjustment of children, increased likelihood of parent-child conflict, and conflict between siblings. Marital conflicts that are frequent, intense, physical, unresolved, and child-related have a particularly negative influence on children, as do marital conflicts that spouses attribute to their child's behavior.

Arguments sometimes fester and linger, which results in escalation of conflict, while conciliatory tactics such as apologizing may not be reciprocated, leaving feelings of inequity or submission. *Imagined interaction conflict-linkage theory* explains the persistence of everyday conflict within the mind through a series of axioms and theorems that have been supported in numerous studies (e.g., Allen & Berkos, 2010; Hample, Richards, & Na, 2012; Wallenfelsz & Hample, 2010). The basic idea in conflict-linkage theory is that imagined interactions (IIs) occur in between actually enacted episodes of the continuing conflict, keeping it “alive” even when it is not behaviorally active. The study of IIs in personal relationships explains why there is often recurrent arguing and why it is often difficult to let go of old arguments (Honeycutt, 2010). Dyadic conflict is emergent and co-constructed; thus, it can go in directions neither person initially intended and can create interactional requirements that neither person welcomes. The purpose of this study is to examine conflict escalation over time. Aggressive, conciliatory tactics and concurrent rumination are observed in terms of probability and advisability. Heart rate (HR) is measured as the conflict unfolds to determine cardiovascular effects.

Providing empirical insight into social cognition, interpersonal communication, and relational experience, this study addresses gaps in research by examining HR as individuals view an escalating marital conflict that ends

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with physical coercion and withdrawal. The participants observe one partner leaving the scene after verbal aggression has occurred as well as physical coercion in the form of throwing objects at a partner in a dispute. Early research reveals that verbal aggression in the form of taunts, ridicule, and personal attacks is the *match* that may result in the form of a *fire* of physical retaliation. In this regard, Infante, Chandler, and Rudd (1989) found that by comparing a clinical sample (60 abused wives from a battered shelter and 53 abusive husbands undergoing group therapy for wife abuse) to a nonclinical sample (80 males and 83 females) that husbands and wives in violent marriages were lower in self-reported argumentativeness while higher in verbal aggression than the nonviolent sample. Even though argumentativeness was slightly associated with verbal aggression, the magnitude of the correlation was somewhat low ($r = .24$). Furthermore, Infante and Wigley (1986) reported a correlation of .32 between physical assault and verbal aggression. Using path analysis, Honeycutt and Bryan (2011) found that verbal aggression was associated with physical coercion ($B = .59$). However, when IIs were included in the model as a mediator between verbal aggression and coercion, the magnitude dwindled. IIs also predicted physical coercion ($B = .38$), suggesting that replaying and anticipating conflict scenes is part of aggression. Honeycutt and Bryan (2011) discuss how the meditational model provides support for Jacobson and Gottman's (1998) profile of the pit-bull batterer. The majority of batterers fit this profile: There is a slow buildup of anger. Hence, the conflict slowly escalates, giving these batterers time to ruminate and plan their strike.

Interestingly, HR is sensitive to sympathetic nervous system activity, which has an evolutionary connection with negative emotions including fear and anger (Levenson & Ekman, 2002). Because IIs are characterized by a variety of emotions and emotional intensity, it is prudent to measure HR in positive and negative II conditions. Additionally, simply viewing conflict may affect HR. For instance, Harrison and Cantor (1999) tracked the effects of movies: Approximately 18% of viewers had an increased HR from viewing horror films or television programs.

Conflict is associated with adrenalin and emotions (for a review, see Gottman, 1994). Hence, we examine conciliation and aggression as means to

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conflict resolution. We include intrapersonal cognition in the form of II rumination (anticipating what a person says next) and individuals' perceptions of these conflict resolutions in conjunction with HR. We examine perceptions of how an evolving conflict will unfold (probability ratings) and what people advise should happen next (advisability) while HR is continuously monitored. Evaluations and perceptions of aggressive behavior are important because individuals' behaviors are affected by their perceptions of the situation. Cognitive attributions of a situation are a major mediator of aggressive behavior (Baron & Richardson, 2004).

Background Studies

We describe conflict in terms of its emotional reception, as some people taking disagreements personally, physiological responses in terms of the sympathetic nervous system, and fight/flight responses. Additionally, individuals can have virtual participation in terms of social learning theory (SLT; Bandura, 1977) as they watch others fight and have autonomic arousal.

Taking conflict personally. The outcome of disagreements largely depends on how participants perceive the conflict situation (Folger, Poole, & Stutman, 2012). While thinking about conflict can lead to productive conflict resolution, it can also serve as a source of escalation and make problems seem worse. When participants take disagreements personally, the conflict situation often becomes destructive. Hample and Dallinger (1995) defined taking conflict personally (TCP) as "a feeling of being personally engaged in a punishing life event. [The person] feels threatened, anxious, damaged, devalued, insulted" (p. 306). The feelings associated with TCP have been associated with the tendency to avoid conflicts, verbal aggressiveness once engaged in conflict (Hample, Dallinger, & Fofana, 1995), the tendency to use inferior ego-defense mechanisms (Hample, Benson, Gogliotti, & Jeong, 1997), and diminished communication effectiveness (Barch, 1994). Because individuals who report high levels of TCP view conflict as a negative, punishing experience, it is likely that trait TCP has some effect on the nature of cognition about conflict communication. People who take conflict personally may have IIs about conflicts that are less positive and productive than

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individuals with low levels of TCP. TCP could help to explain why negative IIs intrude on positive IIs that surface in the course of therapy (Honeycutt, 2003). The relationship between TCP and IIs is an important step in understanding why some people are unable to think productively about conflict.

Cloven and Roloff (1991) discovered that the more a person thinks about a problem, the more serious the problem appears and the more likely it is one will blame the relational partner. This could be related to heart-rate escalation due to the power of rumination in the form of stress. This type of repetitive thought about conflict has the label of “rumination.” Rumination occurs when people “repetitively focus on themselves and on the nature and implications of their negative feelings” (Lyubomirsky, Tucker, Caldwell, & Berg, 1999, p. 1041). Rumination arises under a number of negative affective and decision-making conditions and, hence, can be counterproductive to effective and positive conflict resolution and relationship forgiveness. Recent data in our laboratory reveals a slight correlation between believing that conflict will damage relationships and heart rate after watching an escalating fight between marital partners ($r = .18, p = .003$). Similarly, there was a positive correlation between viewers advising the husband and wife to have proactive IIs by anticipating what they would say next and increased heart rate ($r = .19, p = .003$). This is a partial correlation in which the baseline level of heart rate is statistically controlled for and eliminated as a source of variation in the analysis. Additionally, there are very small associations between persecution feelings (e.g., people feel that they are being personally attacked during arguments) and heart rate ($r = .12, p = .041$) as well as stress reactions defined as biological reactions to arguing (e.g. “Stressful discussions make my stomach hurt”) ($r = .14, p = .012$). Hence, there appears to be small effects for increased heart rate being associated with different measures of rumination.

Physiological insight. Diffuse physiological arousal occurs when adrenalin is pumped into the cardiovascular and endocrine systems. It can be very high during heated arguments (Gottman, 1994). A great body of research indicates that happy and unhappy couples differ in HR variability when discussing events of the day as well as grievances in their relationships (Honeycutt & Bryan, 2011). HR variability, also referred to as interbeat interval (IBI), is a

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measure of the naturally occurring beat-to-beat changes in HR/heart rhythms and serves as an important method for gauging human health and resiliency. It is the physiological phenomenon of variation in the interval between heartbeats and is measured by the variation in the beat-to-beat interval in milliseconds. High IBI rates are related to increased levels of adrenalin, anxiety, and arousal (Porges, 1985). The lower the IBI value, the shorter the cardiac beat, which reflects a faster HR. Under normal conditions, HR is under the control of the parasympathetic nervous system. Generally, resting HR is 70 for men and 80 for women according to the American Heart Association. HR above 105 is high and above the effects of exercise (Rowell, 1986). Raw data from heart rate variability measurement can be converted into heart rate (beats per minute) using a formula where 60,000 is the numerator and the raw IBI value is the denominator. A similar conversion formula is also documented in other published studies (e.g., Peper, Harvey, Mei-Lin, Tylova, & Moss, 2007).

Studies further reveal that heart disease is associated with remembering arguments. There are a number of investigations in IIs in which individuals recall arguments and anticipate ensuing ones such that there is serial or repetitive arguments over unresolvable issues (Gottman & Silver, 2000; Kiecolt-Glaser & Newton, 2001). More specifically, the relational partner's HR immediately after actual discussion was predicted by discrepant IIs and lack of rehearsal (Honeycutt & Bryan, 2011). Physiological data stemming from case studies further revealed changes in IBI related to conversation topics, and also helped indicate whether the discussed issues were pleasing or a source of grievance.

Effects of watching couples fight. Recall the idiom, "Don't wash your dirty laundry in public." Have you ever watched a couple fight or yell in a public setting such as a restaurant or at a park? How did you feel? Recall that SLT claims that people imitate the behavior of significant others including parents, friends, and intimates. Observing ongoing conflict, day in and day out, using contempt by putting each other down, and demeaning the other partner have a lot of negative impact on children. In a six-year study involving more than 2,000 families, El-Sheikh and his associates (2009) measured

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children's physical stress—responses parents may not see because they take place inside the body. When watching parents fight, young subjects often had increased heart rates, faster breathing, and more sweat gland activity. Even when they became familiar with the fights, the children's level of stress did not diminish. When the parents made up, the physiological levels returned to normal. Children who see their parents fight a lot also get sick more frequently, tend to become more aggressive, have more depression and anxiety, and don't sleep as well as children from lower conflict homes.

Fight and flight and autonomic arousal. While watching couples fight, our sympathetic nervous system (SNS) may be activated in participants of an argument and in viewers as well. A fight or flight reaction is a response to stress characterized by boosts of adrenaline, dilated pupils and a fast HR. According to Cannon's (1927) descriptions, when an animal is frightened or imperiled, the SNS responds, causing adrenaline boosts, changes in pupils and HR, and sometimes extra strength shown in bursts of speed. Some also refer to a third state, "fright," occurring when an animal doesn't flee or fight, but panics and passes out or stands still—the typical "deer in the headlights" response or the collapse of sheep if chased by a dog.

One might suppose that merely observing conflict might have a relatively minor effect on the SNS. Studies in animals and humans have demonstrated that simple exposure to physical or psychological threats (e.g., watching others be intimidated in a football game or any conflict-escalating video) can activate the SNS (Dickerson & Kemeny, 2004). Furthermore, acute exposure to external stressors and threats hinder white blood cells such that the immune system is impaired (Dhabbar, 2003). The findings about cortisol and the immune system are indirect support for our expectation that conflict observation will influence HR because they all track back to changes in the SNS.

The criticism that viewing does not activate the SNS also receives little merit when examining LeDoux's research on fear and the amygdala (see chapter 11). Olsson, Nearing, and Phelps (2007) discuss the assumptions of classical fear conditioning, which has been used to explain fear learning across species. This type of conditioning requires first-hand experience with an aversive event such as being in a nasty argument as opposed to a construc-

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tive disagreement. Research reveals that cortisol exerts a permissive effect on the SNS, resulting in increased HR in preparation for physical exertion and vigilance in the form of monitoring. The power of social observation with no personal experience of the aversive event engages similar neural mechanisms as fear conditioning. The amygdala was used when subjects observed someone else being submitted to an aversive event. Their findings provide awareness into the association between learning from, and empathizing with, fearful others because “indirectly attained fears may be as powerful as fears originating from direct experiences” (Olsson et al., 2007). On this basis, we examine student observer’s fluctuation in heart rates as they observe escalating conflict in conjunction with their tendency to take conflict personally.

Current Study

The purpose of this study is the examination of conflict escalation over time in which HR is monitored on viewers of an unfolding dispute. It is expected that HR will increase in accordance with the rising intensity of the argument. In another study, Honeycutt, Sheldon, Pence and Hatcher (2014) examined how people judge the probability and advisability of aggressive (e.g., hitting) versus conciliatory actions (e.g., discussing disagreements rationally) in an unfolding dispute within a married couple, and if IIs were seen as a desirable form of communication for the conflict-engaging couple. Individuals participated in a study employing two videotaped scenarios depicting martial conflict. One situation involved male-initiated while another one illustrated female-initiated conflict. Viewers were presented with a list of possible reactions, ranging from highly conciliatory actions (apologize, ask for forgiveness, discuss the issue calmly) to physical violence or aggression (push, grab, shove partner; slap partner; throw, smash, hit or kick something; hit or try to hit partner with something). A separate study revealed that the videos were highly believable. Honeycutt et al. predicted that the husband would be more likely to be conciliatory than the wife, and the wife would be more aggressive than her husband. They found this was the case. Gottman and his associates (1998) reported a tendency for wives to initially bring up sensitive or conflictual topics for discussion while the husband deferred. Bookwala et al. (2005) also reports that women used less

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calm discussions and were likely to engage in heated arguing during disagreements. Additionally, Honeycutt and his associates (2014) found that the male was more likely to have retroactive IIs and replay the conflict in his mind. Hence, men may feel catharsis by imagining discrepant scenarios that relieve tension or anxiety. Participants in the study advised the husband to replay the arguments in his mind before the next scene. We speculate that having retroactive IIs would help to relieve tension from the conflict in a previous scene, and potentially resolve the conflict.

When viewers watch an escalating conflict, game theory posits that people's cultural scripts for conflict resolution involve "tit for tat" (Rapoport, 1966). Based on the English saying meaning "equivalent retaliation", a person using this strategy will initially cooperate, and then respond in kind to an opponent's previous action. If the opponent previously was cooperative, the person is cooperative and vice versa. According to Axelrod (1997), "tit for tat" is successful because it is "nice", "provokable" and "forgiving". A nice strategy is one that is never first to defect. In a match between two nice strategies, both do well. A provoking strategy responds by defecting at once in response to defection. A forgiving strategy is one that readily returns to cooperation if its opponent does so; unforgiving strategies are likely to produce isolation and end co-operative encounters.

Methodology. A series of exchanges reflecting game theory episodes escalating to violence was presented in our interaction lab using an electronic Qualtrics survey packet. Participants watched a series of five scenes. Each scene was paused and observers were queried about a series of reactions to each exchange ranging from highly conciliatory reactions (embracing and kissing the partner, apologize, laugh) to increasingly more aggressive behaviors (defending, criticize the other's personal attributes, curse sarcastically, throwing the dinner on the floor, hitting the partner). Participants were asked to indicate the probability, desirability, and the extent to which they would advise each of these options on a series of 7-point scales. After making initial ratings, participants turned a page to learn which reactions occurred. These reactions were more aggressive than the action that preceded them. For example, the first "scene" ended with the participants reading that a conciliatory option of "embracing" had occurred while the final scene

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informed them that “hitting the partner” occurred. On the basis of Honeycutt and his colleagues’ (2014) prior research, we predicted that conciliatory options would be less endorsed as the scenes unfolded while aggressive options would be increasingly endorsed. This hypothesis was supported, but the effect was stronger for women.

Observers watched either a five-scene marital dispute in which conflict was either initiated by the husband or wife. Separate groups of viewers watched a clip that was identical except for the sex of the conflict-initiator. Viewers were presented with a list of nine possible reactions, representing three conciliatory actions (apologize, ask for forgiveness, discuss the issue calmly) and five aggressive reactions (insult, swear or curse; push, grab, shove partner; slap partner; throw, smash, hit or kick something; hit or try to hit partner with something). Conciliatory items were adapted from the original Conflict Tactics Scale (Straus, 1979) while we added the items for forgiveness and apologizing. Aggressive items were derived from the Revised Conflict Tactics Scale (CTS2) (Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Additionally, II rumination items were based on the II proactivity and retroactivity attributes taken from the abbreviated SII Scale (Honeycutt, 2010). A sample item from the wife-initiated conflict version for proactivity is, “What is the probability that the wife (husband in the husband-initiated conflict version) will think about what to say next?” A sample item for retroactivity is, “What is the probability that the wife is replaying the previous scene in her mind?” Participants were also asked about taking conflict personally overall after watching the video.

Description of scenes. Although there were five scenes in each scenario, participants were not asked for opinions on what would happen next in the fifth scene because it was the last one; hence, the analysis is concerned with four scenes. The story began when Lisa (Mark in the second version) criticized Mark (Lisa in the second version). A series of exchanges escalating in violence was presented to participants. The videos show a typical case of family violence, where hostile language serves as a “trigger” for the release of impulsive aggressive responses. The first scene starts with verbal aggression while the last scene culminates in physical violence. This pattern is

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typically observed in previous studies reviewed by Honeycutt and Bryan (2011). In the first scene, the wife (roles are reversed for the second video) comes home tired after a long day at work to find her husband watching TV. The wife is frustrated with him for being unable to find work under the current economic conditions and criticizes his cooking. In the second scene, she continues criticizing his meal, and he withdraws to the bedroom to watch television. The wife then follows him in the third scene, and they both start arguing. The fourth scene culminates in verbal aggression, and the fifth scene in physical violence, with the wife throwing a vase at her husband before he manages to run out of the room. As he reaches the front door, the wife shoves him into the door. He breaks free and leaves.

Latent Growth Curve Modeling. We analyzed the data using a technique known as latent growth curve modeling, which is a longitudinal analysis technique to estimate growth over a period of time. Within LGCM, we are not inherently interested in the observed repeated measures of each scene over time. Instead, we are attentive to the unobserved (latent) factors (aggressive tactics, conciliatory tactics, rumination) that are posited to underlie the repeated measures. Using LGCM, we can determine if various conflict tactics' probability and advisability are linear and continue to rise. Viewers were asked to predict what would happen from a list of conflict tactics that are widely available in the social science literature and listed above.

Two growth curve models were estimated. The first one involved the conflict tactics while the second analysis was change in HR, which was measured using Polar F2 HR monitors worn on the non-dominant hand of the viewer. Continuous HR was measured but we calculated summed averages for each scene. Also, version (husband versus wife-initiated conflict) and sex (male, female) were examined for their effects on predicting whether conciliation, aggression, and rumination would be predicted for ensuing scenes. Recall that Honeycutt and his associates (2014) found that viewers increasingly recommended aggressive options for the wife, but not the husband, representing viewers' conflict-escalation scripts. In this regard, people have implicit scripts that shape their expectations about how a conflict will unfold (Buzzanell & Burrell, 1997).

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Table 1: Latent Growth Curve Model Parameter Estimates for Probability Ratings

Parameters	Coefficients			
	S1	S2	S3	S4
Aggression intercept	.59	.64	.56	.40
Mean (Standard Error)	2.16 (.09)	1.92 (.08)	1.82 (.10)	2.14 (.14)
Aggression slope	.00	.46	.80	.85
Conciliatory intercept	.61	.57	.63	.74
Mean (Standard Error)	2.26 (.10)	2.79 (.10)	2.45 (.09)	2.02 (.10)
Conciliatory slope	.00	.20	.63	.74
II Rumination intercept	.67	.52	.51	.60
Mean (Standard Error)	4.76 (.09)	4.48 (.10)	3.93 (.10)	4.40 (.11)
II Rumination slope	.00	.15	.29	.51

Version was a significant, exogenous predictor of initial II rumination (b intercept = $-.20$, $p = .048$) but not a predictor of change (b slope = $.08$, $p = .515$) in the latent growth curve analysis. Hence, the negative intercept means a moderate level of replaying the conflict and imagining what to say next is expected in the husband-initiated conflict as the wife reacts aggressively. Sex was also a significant predictor of change for escalating aggression (b slope = $-.19$, $p = .003$) but not a predictor of initial aggression (b intercept = $.04$, $p = .681$). For readers familiar with goodness of fit statistics, the model presented a good fit to the data ($\chi^2(44, N = 341) = 3.42$, $p = .000$, CFI = $.91$, RMSEA = $.08$, (90% CI: $.07, .09$). As revealed in the slopes for the aggression probability ratings in Table 1, aggressive tactics were dramatically expected to increase in the second scene ($b = .46$) much more than conciliatory tactics in the second scene ($b = .20$). Yet, conciliation was expected to increase in the ensuing scenes (b scene3 = $.63$, scene 4 = $.74$). II rumination was not expected to increase that much in scene 2 ($b = .15$) while only increasing a little more in scene 3 ($b = .29$) and then rapidly escalating in scene 4 ($b = .51$).

In terms of sex predicting biological aggression, prior research reports a tendency for wives to initially bring up sensitive or conflictual topics for discussion while the husband defers (Denton & Burlison, 2007; Gottman et al., 1998; Honeycutt & Bryan, 2011). This is referred to as *agenda initiation* since the conflictual discussion is initiated by introducing a topic that may result in disagreements and conflict. Additionally, Bookwala et al. (2005)

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have reported that women use fewer calm discussions and are more likely to engage in heated arguing during disagreements with relational partners. The latent growth curve analysis revealed a marginal effect for sex of the viewer in which males expected the aggressive reactions to rise (b slope = $-.17$). These reactions to negative communication are evidenced through means such as elevated adrenal excretions and blood pressure.

The ratings of HR escalation can be reported for five scenes because HR was measured after the final scene. Table 2 presents the growth curve results. Again for readers who may be familiar with goodness of statistics, the model provided a superb fit to the data because autocorrelation was corrected at lag one and two; $\chi^2(7, N = 341) = 4.26, p = .750, CFI = 1.00, RMSEA = .00, (90\% CI: .00, .02)$.

There were poorer models fits when autocorrelation was not corrected. This means that data can be forecast from their past. As Gottman (1994:73) notes, “if data can be forecast from their past, it is difficult to make inferences about linkages between variables.” Hence, if heart rate in scene 2 can be predicted from heart rate in scene 1 and so on, you have to correct for this bias (lag 1 autocorrelation). The solution is to statistically test for the presence of autocorrelation at different time periods (or lags) and remove the autocorrelation. Informally, it is the similarity between observations as a function of the time separation between them. Statistical removal of the autocorrelation yields an unbiased indicator of current heart rate.

Table 2: Latent Growth Curve Model Parameter Estimates for Heart Rate

Parameters	Coefficient				
	S1	S2	S3	S4	S5
HR Intercept	.90	.94	.96	.50	.99
Mean (SE)	85.08 (1.99)	84.92 (1.92)	84.01 (1.86)	85.66 (2.51)	81.74 (1.81)
HR slope	.00	.06	.12	.23	.20

Note: Values corrected for autocorrelation lags 1 and 2

HR is stable across scenes 1-4. However, it decreases in the final scene where the conflict-initiator throws an object (vase) at the partner who then leaves the duplex. The bottom line in this analysis is that the sympathetic nervous arousal is activated when individuals watch an escalating conflict. Part of this arousal may be due to II rumination, in which individuals are

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ruminating about the argument while it is occurring (replaying of prior scenes and forecasting of ensuing scenes). Honeycutt (2003) discusses online IIs, which occur simultaneously to ongoing conversation. Online IIs occur simultaneously while talking with another person while offline IIs occur outside of the actual interaction (Honeycutt, 2003). Proactive IIs occur before anticipated encounters, but can be used in the case of online IIs when anticipating ensuing arguments by another person. This occurrence often happens in the case of serial or repetitive arguing when all arguments have been exhausted and are merely restated (Berger, 1997). Hence, the persons anticipate the repetitive claims. Retroactive IIs represent flashbacks as person replay prior statements to understand what the other said. A major function of IIs is rehearsing for anticipated or ensuing encounters (scenes in this case) and the use of catharsis in order to relieve stress. Additional data analyses revealed that as the conflict evolved, the viewers believed that the aggressive actions or physical violence would rise, while conciliatory behavior, such as asking for forgiveness or apologizing, would decline. Moreover, the participants did not think that the partners were likely to forgive each other. The perceived severity of a transgression is a primary predictor of how partners approach forgiveness (Fincham & Beach, 2002).

A major point of this study is that even while watching conflict escalate, HR is relatively constant but then rises in critical scenes when the conflict is dramatically escalated through object throwing and exiting the immediate scene. Moreover, elsewhere Hatcher (2013) has shown that an increase in diastolic pressure while viewing escalating conflict is associated with taking conflict personally ($\beta = .14, t = 1.81, p < 0.05$). In other words, as diastolic pressure increased, so did taking conflict personally. However, there was no relationship between increases in systolic pressure and taking conflict personally. One of the major causes of elevated diastolic pressure is stress or anxiety. Thus, as stress or anxiety at the conflict escalation increased, diastolic pressure also increased.

Applications to Mental and Physical Health

When people take conflict personally and ruminate about conflict through IIs, anger and aggression have been thought to contribute to cardiovascular

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disease since the 19th century (Kemey & Shestyuk, 2010). Hostility is strongly associated with the progression of coronary artery disease (Boyle et al., 2004), high blood pressure, atherosclerosis, and coronary artery calcification (Suinn, 2001). Effect sizes can be as large as those associated with smoking and diet.

Controlling anger may help cardiovascular and emotional health. Evidence from multiple studies supports the association between emotions and heart disease (Chida & Steptoe, 2009). For example, anger and hostility are significantly associated with more heart problems in initially healthy people, as well as a worse outcome for patients already diagnosed with heart disease. The same study also showed that chronically angry or hostile adults with no history of heart trouble might be 19% more likely than their more placid peers to develop heart disease. Researchers found that anger and hostility did more harm to men's hearts than women's. Among patients already diagnosed with heart disease, those with angry or hostile temperaments were 24% more likely than other heart patients to have a poor prognosis. In terms of controlling heart rate, there is an I-phone app; cardiio.com. This application was studied at the MIT Media Lab. Blood is pumped into the face with every heart beat. A slight increase in blood volume causes more light to be absorbed, and hence less light is reflected from your face. Cardiio uses your camera to track miniscule changes in reflected light that are not visible to the human eye and calculate your heart beat! Measurement accuracy is within 3 beats/min of a clinical pulse oximeter when performed at rest in a well-lit environment. Cardiio provides you with a fitness level rating and estimates your potential life expectancy. The application encourages you to regularly scan your heart rate when waking up in order to get a resting, basal rate as well as after exercise, during yoga or before a meeting with your boss or someone who is important to you. The application provides heart rate changes over time through visualizations of the saved data. More importantly, the data can be exported to an excel file for eventual, statistical analysis.

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Future Research

Our future projects include examining interpersonal conflict in conjunction with pheromones. Couples will come to the Matchbox Lab at The Louisiana State University and discuss the source of greatest contention in their relationship. Some couples will argue in a no-smell condition, some will argue in a fear pheromone condition (axillary pads collected from individuals watching a scary movie are placed near the couple), and some will argue in an affection/mating condition (axillary pads collected from individuals in a particularly amorous setting are placed near the couple). The couples will be videotaped and their behaviors will later be coded for specific conflict behaviors. The participants will also be asked to fill out questionnaires about their relationships, conflict style, how they felt during this particular discussion, and how much this discussion varied from the way they usually discuss the topic. Finally we will measure IBI, somatic body movement, and electrodermal response throughout the interaction. Results might offer new insights into how we engage in interpersonal conflict.

We are also examining the ISO principle of music therapy in our lab in terms of physiological reactions to conflict. The ISO principle of music stands for Incremental Sound Organizer and matches the mood of the patient to the music being played and/or listened to, which in turn fosters the achievement of an altered state of consciousness. Agenda initiation reflects who initiates conversations and sets the agenda for discussion (Honeycutt & Bryan, 2011). However, in this case because one topic is pleasing while the other topic reflects complaints, which topic is first discussed? This question is analogous to asking if one wants to discuss “bad” or “happy” news first. We were interested in the ISO principle of music therapy in correspondence with discussing pleasing and displeasing topics in their relationships.

Conclusion

SLT says that people model their behavior by watching others. Hence, when we watch others fight, adrenalin may be released in the system activating the sympathetic nervous system. The classic fight or flight reaction is a response to stress characterized by boosts of adrenalin, dilated pupils, and a fast

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heartbeat. Some critics may contend that the SNS is less likely to be activated when observing conflict as opposed to being directly involved in it. Yet, this criticism is dubious when considering other studies, especially the work of Joseph Ledoux in this volume. HR was relatively constant when watching a marital argument, but rose when the one of the partners exited the scene. Recall the purpose of “time out” is to immediately end the conflict escalation. Yet, during time out individuals often have retroactive IIs in which they replay the argument as well as ruminating about revenge (Honeycutt, 2004).

Discussion Questions

1. *A friend comes to you saying that they had a serious argument with their partner in whom they either slapped or shoved them or were the recipients of the slaps or shoves. Your friend asks for advice on what he/she should do next. What do you tell them; consider leaving their partner (exit), continue to raise the divisive issue (voice), pretend as if nothing happened (loyalty), or something else?*
2. *Think of the last serious argument you had with someone. Did you or the interaction partner take the conflict personally? Did you use aggressive or conciliation tactics as well as replaying what was just said and anticipating what was going to be said next? Was the conflict resolved? Why or why not?*
3. *Have you ever noticed a “racing heart” or perspiration while engaged in a heated argument with someone or do you feel as if you are quite calm while arguing? Are you eager to defend your opinion when someone challenges your beliefs (conflict-engager) or do you prefer to remain quiet (conflict-avoider)?*

Key Terms

Imagined interaction, social learning theory, game theory, quid-pro-quo, rumination, conflict escalation, taking conflict personally, conciliation, forgiveness

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