

Moving Past Conflict: How Locomotion Facilitates Reconciliation in Humans and
Chimpanzees (*Pan troglodytes*)

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ABSTRACT

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Social animals must overcome conflicts, an inherent and often detrimental consequence of gregarious life. One strategy for doing so is reconciliation, or post-conflict affiliation between former opponents. In humans and other primates, this behavior is often assumed to require a switch between opposing motivational states (e.g., anti- to pro-social). In this thesis, I argue that reconciliation is facilitated by an underlying individual tendency for movement and change between states, a motivation known as locomotion. Section one of this thesis uses a longitudinal, observational approach to establish stable individual differences in chimpanzee reconciliation while controlling for numerous relational factors known to influence the occurrence of this behavior. These individual differences are then related to several behavioral proxies of locomotion motivation. Section two of this thesis explores the relation between locomotion and conflict resolution in humans, using a range of methodological approaches and measures, including hypothetical scenarios, experimental inductions, essay studies, narrative reflections, and dyadic interactions. I conclude by emphasizing the importance of going beyond relational and other instrumental approaches to conflict resolution in order to understand more fundamental individual motivations underlying reconciliation behavior. If an individual motive to effect change and therefore resolve conflict in turn impacts one's social relationships, it has even broader significance. Across the primate order, the influence and importance of such relationships suggest the potential role of reconciliatory motivations when it comes to individual survival, health, and overall well-being.

TABLE OF CONTENTS

List of Figures & Tables	iii
Acknowledgements	iv
General Introduction	1
Section I: Chimpanzee Research	
Introduction.....	14
Method.....	17
Results.....	23
Discussion.....	29
Conclusions.....	32
Section II: Human Research	
Introduction.....	35
Study 1: Conflict Scenarios.....	42
Method.....	43
Results.....	45
Discussion.....	47
Study 2: Experimental Inductions.....	49
Method.....	49
Results.....	51
Discussion.....	53
Study 3: Conflict Essays.....	54
Method.....	55
Results.....	57
Discussion.....	60
Study 4: Conflict Narratives.....	62
Method.....	63
Results.....	66

Discussion.....	68
Study 5: Dyad Discussions.....	70
Method.....	71
Results.....	74
Discussion.....	77
Conclusions.....	80
General Discussion.....	85
References.....	95
Appendix A: Regulatory Mode Questionnaire (RMQ).....	116
Appendix B: Conflict Scenarios.....	118
Appendix C: Supplementary Tables.....	120

LIST OF FIGURES & TABLES

Section I: Chimpanzee Research

Table 1: <i>Description of Variables used in Models 1 & 2</i>	22
Figure 1: <i>Mean Corrected Conciliatory Tendency (CCT) per Subject</i>	24
Table 2: <i>Results of Model 1</i>	25
Table 3: <i>Results of Model 2</i>	26
Figure 2a: <i>CCT & Social Behavior Switches</i>	28
Figure 2b: <i>CCT & Social Partner Switches</i>	28
Figure 2c: <i>CCT & Latency to Reconcile</i>	28

Section II: Human Research

Figure 1: <i>Locomotion Predominance X Negative Feelings on Reconciliation</i>	47
Figure 2: <i>Reconciliation by Regulatory Mode Induction Condition</i>	52
Figure 3a: <i>Locomotion Predominance & Conflict Strategies</i>	58
Figure 3b: <i>Locomotion Predominance & Reported % Reconciliation</i>	60
Figure 4a: <i>Locomotion Predominance & Ripeness</i>	67
Figure 4b: <i>Ripeness Mediates Locomotion Predominance-Affect Link</i>	68
Figure 5: <i>Regulatory Mode Predominance & Conversation Length</i>	77
Table S1: <i>Study 1 Regulatory Mode Strength Multiple Regressions</i>	120
Table S2: <i>Study 2 Regulatory Mode Strength Multiple Regressions</i>	121
Table S3: <i>Study 3 Regulatory Mode Strength Multiple Regressions</i>	122
Table S4: <i>Study 4 Regulatory Mode Strength Multiple Regressions</i>	123
Table S5: <i>Study 5 Regulatory Mode Strength Multiple Regressions</i>	124

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In sum, conflict among monkeys, people, and even entire groups or nations follows a certain dynamic that is universal, and so is its resolution...

... Emphasis on the role of personality and individual differences in psychology can bring useful insight to research on animal conflict regulation. Similarly, concepts such as attachment and separation, so central in developmental and social psychology, appear to share unexplored similarities with aggressive conflict and post-conflict reunions in nonhuman primates. Primatologists and other students of animal behavior would benefit from learning more about these psychological concepts.

— *Natural Conflict Resolution* (Aureli & de Waal, 2000)

GENERAL INTRODUCTION

Nonhuman Reconciliation

Conflict is a pervasive and potentially disruptive facet of social life. However, given the many benefits associated with group living, animals have evolved strategies to mitigate its inherent costs. One such strategy is reconciliation, first defined by de Waal & van Roosmalen (1979) as post-conflict affiliative behaviors between former opponents. Initially documented in chimpanzees, reconciliation has since been reported in over 30 primate species (reviewed in Aureli, Cords, & van Schaik, 2002) and a growing number of other social mammals (reviewed in Schino, 2000). As the most widely studied post-conflict phenomenon of nonhuman animals, reconciliation's two central assumptions are that it involves a switch between opposing motivational states (i.e., from hostility and fear to a positive inclination), and that this motivational shift serves to repair social relationships (de Waal, 2000). Whereas some research has corroborated the reparative consequences of this behavior (e.g., Aureli & van Schaik, 1991; Cords, 1992), the majority to date has sought to explain variation in reconciliation's occurrence. Traditionally, this has been conceptualized and carried out at the species, group, or dyadic level of analysis.

For example, *Macaca* species characterized by higher levels of despotism generally exhibit lower tendencies to reconcile as compared to more socially tolerant species (reviewed in Thierry, 2000). The relative influence of kinship on reconciliation (detailed below) has also been shown to covary with respect to species dominance style (e.g., Aureli, Das, & Veenema, 1997). Researchers have further found variation in both the presence (Palagi, Paoli, & Tarli, 2005) and frequency (Castles, Aureli, & de Waal, 1996)

of reconciliation across separate groups of the same species, likely reflecting disparate social conditions. Beyond species and group differences, most previous research has focused on the dyad, particularly under predictions generated by the Valuable Relationships Hypothesis (VRH; de Waal & Aureli, 1997). According to the VRH, reconciliation should occur whenever the quality of relationships has important fitness consequences (Kappeler & van Schaik, 1992).¹ As certain social partners are likely to derive more benefits from their relationship, a variety of studies have corroborated that reconciliation is augmented among valuable opponent dyads (see van Schaik & Aureli, 2000). For example, in species with nepotism-based patterns of affiliation and dominance, kin reconcile more than non-kin (Castles & Whiten, 1998; Schino, Rosati, & Aureli, 1998). Reconciliation is also higher in dyads with frequent cooperation (Wittig & Boesch, 2003), grooming and agonistic support (Cooper, Bernstein, & Hemelrijk, 2005), stronger social bonds based on sex-class (reviewed in Watts, 2006), and even those whose relationship value has been experimentally enhanced (Cords & Thurnheer, 1993).

Though other accounts have been provided (e.g., Silk, 2002), the VRH is the most commonly cited explanation for variation in reconciliation,² recently receiving additional attention in the human literature (McCullough, Luna, Berry, Tabak, & Bono, 2010). It is worth emphasizing, however, that relationship value may very well depend on which partner of the interaction is under consideration. This underscores a basic argument that within a dyad, the fitness consequences of reconciliation are *not* necessarily the same for each opponent. But while proponents of the VRH have correctly pointed out that value in

¹ Assuming conflict actually disrupts such relationships (Aureli et al., 2002).

² See Silk (1996) and Cords & Aureli (1996) for a debate on the issue.

a given relationship is not always symmetric (i.e., equivalent for both partners; e.g., Cords & Aureli, 2000)³, the premise has not yet led to a systematic investigation of whether *individuals* are therefore differently motivated to resolve conflict.

Individual Differences

While much prior research has demonstrated that variation in reconciliation is manifest along these dimensions (i.e., species, group, dyad), it remains less clear whether such is the case at the individual level of analysis. In contrast, research emerging across an array of domains and taxa has turned its focus to this level in particular (see Sih, Bell, & Johnson, 2004). As the subject of a large and growing body of recent studies, individual differences in animal behavior provide a forum for an interdisciplinary dialogue (Réale, Dingemanse, Kazem, & Wright, 2010), bridging traditionally distinct fields such as behavioral ecology and personality psychology (Gosling, 2001; Nettle & Penke, 2010; Wolf & Weissing, 2012). Indeed when behavioral differences between individuals are consistent over time and across situations, they are often deemed animal ‘personalities’ (though other terminologies, such as temperaments or behavioral syndromes, are used: Bell, 2007; Réale, Reader, Sol, McDougall, & Dingemanse, 2007). However, while a number of previous studies regarding stable individual variation have focused on aggressive behaviors (reviewed in Sih, Bell, Johnson, & Ziemba, 2004), none have focused on the aftermath of aggression (i.e., post-conflict behaviors). Perhaps because reconciliation is inherently an inter- as opposed to intra-individual phenomenon, individual motivations for resolving conflict have traditionally appeared less important outside of a relational context.

³ As one plausible example, an alpha male and his subordinate companion might place different fitness values on their relationship.

Human Reconciliation

While social psychology has a longer tradition of recognizing that individual-level variables affect interrelational processes (Leary & Hoyle, 2009), even here relatively little specific consideration has been given to how individual differences shape reconciliation. The human literature typically emphasizes forgiveness, most commonly defined as the set of post-conflict motivational changes whereby an individual becomes decreasingly motivated by negative inclinations and increasingly motivated by positive conciliation (McCullough, Worthington, & Rachal, 1997). Although most psychologists agree that forgiveness and reconciliation are distinct constructs, there is less consensus over *how* they differ, and particularly whether one is a precondition for the other. While some argue that forgiveness is a means toward reconciliation (e.g., Auerbach, 2004), others maintain the exact opposite (e.g., Kanz, 2000; Kearns & Fincham, 2004). Many authors emphasize their functional independence (e.g., de Waal & Pokorny, 2005; Deutsch, 2006), citing the various combinations of forgiveness and reconciliation that are possible (see Freedman, 1998 for useful examples). Among the most constructive generalizations to emerge from this work is that unlike forgiveness, reconciliation implies a restoration of the relationship. When one forgives, on the other hand, he or she does not necessarily resume friendly relations with the offender. Further, while reconciliation can take many different forms, it does not always assume culpability, as is the case with forgiveness. Many conflicts do not result from unequivocal transgressions, but rather involve (and persist because of) conflicts of interest in which there is a dual sense of blame and victimhood. Reconciliation requires that two individuals come together again (Enright, Freedman, & Rique, 1998) in an agreement that the conflict will no longer

disrupt the relationship, whereas forgiveness involves one individual internally absolving another. This underscores the more basic premise that reconciliation is a relational outcome (McCullough, Kurzban, & Tabak, 2013)⁴ whereas forgiveness is an individual outcome.⁵

The limited set of work that has been done on human reconciliation⁶ has focused almost exclusively on children and adolescents. Adopting observation methodology similar to that of the nonhuman work, research confirms that children also engage in friendly post-conflict reunions with former opponents (Verbeek, Hartup, & Collins, 2000). However, also akin to the animal work, such research has habitually emphasized species (e.g., comparing the function of human to nonhuman primate reconciliation: Ljungberg, Westlund, & Forsberg, 1999), group (e.g., cultural differences with respect to conciliatory tendencies and strategies: reviewed in Butovskaya, Verbeek, Ljungberg, & Lunardini, 2000) and dyad (e.g., testing the VRH) differences in conciliatory tendency. With respect to the latter, several studies have compared reconciliation rates among friends and non-friends, yielding inconsistent patterns of results (*cf* Butovskaya & Kozintsev, 1999; Verbeek & de Waal, 2001 and Fujisawa, Kutsukake, & Hasegawa, 2005). Though various explanations have been provided, perhaps alternative reasons for a failure to detect support for the VRH could be illuminated by exploring the role of

⁴ Importantly, this does not preclude *individual* motivations for this behavior.

⁵ See Hook et al. (2012) for a study of individual differences in conceptualizations of forgiveness.

⁶ Here we refer specifically to reconciliation between individuals, as opposed to inter-group or even national-level reconciliation.

individual differences. However, like the animal conflict resolution literature, such differences have not been the focus of scientific study (but see Dunn & Herrera, 1997).

In adults, there has been much less directly comparable work on reconciliation behavior, likely because the social and cognitive mechanisms in place are more similar across children and nonhuman primates (see Cords & Killen, 1998), and for practical reasons, such as the feasibility of observations. Adult reconciliation typically extends beyond overt behavioral interactions, involving more sophisticated social-cognitive capacities, such as language. Regarding forgiveness, previous research has investigated how situational, relational, and only very recently, individual variables influence the tendency to forgive. Situationally, forgiveness varies as a function of factors like apologies (Weiner, Graham, Peter, & Zmudlnas, 1991), attributions of responsibility and intent (Eaton, Struthers, & Santelli, 2006; Struthers, Eaton, Santelli, Uchiyama, & Shirvani, 2008), and perceptions of justice (Karremans & Van Lange, 2005). Relational characteristics, such as empathy and closeness (McCullough et al., 1998) as well as high relationship commitment (Finkel, Rusbult, Kumashiro, & Hannon, 2002) promote partner forgiveness. Individual dimensions, for example rumination tendencies (McCullough, Bono, & Root, 2007), implicit and explicit self-esteem (Eaton, Struthers, Shomrony, & Santelli, 2007), and religious/spiritual predilections (McCullough & Worthington, 1999)⁷ can also play a role in determining forgiveness. Despite the fact that forgiveness represents an individual outcome, forgiveness theory has focused less on stable (i.e., dispositional) factors. Personality traits, such as agreeableness and neuroticism, have

⁷ Empirical research has yet to discern, however, whether religious individuals merely believe themselves/aspire to be more forgiving, or demonstrate higher forgiveness for real transgressions.

repeatedly been shown to predict (positively and negatively, respectively) forgiveness (reviewed in Mullet, Neto, & Rivière, 2005). Dispositional forgiveness, or an individual's propensity to forgive over time and across situations (e.g., Roberts, 1995; Berry, Worthington, Parrott, O'Connor, & Wade, 2001) has also been related to these traits, and further applied to research on attachment and depression (Brown, 2003; Burnette, Taylor, Worthington, & Forsyth, 2007).

Although an exhaustive review of the human forgiveness literature is beyond the scope of this dissertation, it bears repeating that it has not traditionally emphasized stable individual variation. And despite the fact that research on individual differences in forgiveness is gradually increasing, it is noteworthy that the majority of this work explores constructs that are not as readily apparent, identifiable, or measurable in other species. Consequently, a rich comparative discourse—off to an auspicious start over a decade ago (see Aureli & de Waal, 2000)—has become less of a reality.⁸ On this point, I now turn my focus to a common theme across both the human and nonhuman animal conflict resolution literatures.

Motivational Switch

One important similarity between reconciliation and forgiveness within these literatures is the concept of motivational *change* (e.g., McCullough et al., 1997; de Waal, 2000). McCullough and colleagues' (1997) well-cited definition of forgiveness (a switch from negative to positive motivational states) coincides with de Waal's (2000) description of such a switch as one of the most fundamental aspects of reconciliation. The

⁸ Nonetheless, the interdisciplinary interest in evolutionary mechanisms for conflict resolution has continued (see Long & Brecke, 2003; McCullough, 2008; Verbeek, 2008; Fry, 2013).

definitional overlap points to a much broader characterization—that at its core, the process of conflict resolution is *a process of change* (Marcus, 2006). In his account of social-psychological approaches to conflict, Kelman (2008) elaborates on this characterization: “conflict resolution efforts must be geared to discovering the possibilities for change, identifying the conditions for change, and overcoming the resistances to change.” The inherence of change has been emphasized by many other practitioners and researchers of conflict resolution (reviewed in Mitchell, 2005), even at the individual level of analysis (Shapiro, 2006). And despite inevitable differences across disciplines (contributing to the unfortunate lack of overlap), this theme is a recurring and potentially unifying one. However, these claims are mostly of a conceptual nature. Surprisingly, no formal theories have been applied or developed to test the role of an *individual motivation for change* in conflict resolution.⁹ Though empirical studies have not yet been conducted, there is strong consensus that various mechanisms for attenuating conflict (whether reconciliation, forgiveness, or others) will be shaped by a motivation toward some new (changed) end-state.

When it comes to individual differences, then, it follows that a more basic and general motivation for change could facilitate reconciliation. Regulatory Mode Theory (RMT; Kruglanski et al., 2000; Higgins, Kruglanski, & Pierro, 2003) describes this as *locomotion*, a motivation for change (Scholer & Higgins, 2012) and movement, as well as *fast* initiation of change and movement from state-to-state. Importantly, locomotion regards change *as an end in itself*, emergent from any region within the life space,

⁹ Notwithstanding a relevant literature on the role of change in conflict processes more broadly—e.g., ripeness theory (e.g., Zartman, 1989; 2000; Coleman, 1997; 2000) and dynamical systems theory (Coleman, 2006)—described in further detail in Section II.

behaviorally and/or psychologically. Numerous studies have consistently shown that individuals with strong locomotion motivation want to effect change (Higgins, 2012). Importantly, locomotion can vary across individuals both as a chronic individual difference (see Kruglanski et al., 2000) and an induced momentary state (see Avnet & Higgins, 2003). Such variation has been shown to affect domains as diverse as judgment and decision-making (Avnet & Higgins, 2003), physical exercise (Mannetti, Pierro, Higgins, & Kruglanski, 2012), intrinsic/extrinsic motivation (Pierro, Kruglanski, & Higgins, 2006), counterfactual thinking and regret (Pierro et al., 2008), inter-temporal choice (Mannetti et al., 2009), group performance (Mauro, Pierro, Mannetti, Higgins, & Kruglanski, 2009), leadership styles (Kruglanski, Pierro, & Higgins, 2007), and comparative advertising (Pierro et al., 2013). Indeed, across a variety of realms, locomotors generally show a strong preference for dynamic action over stasis (Kruglanski, Pierro, Higgins, & Capozza, 2007; Mannetti, Giacomantonio, Higgins, Pierro, & Kruglanski, 2010), creating newfound implications for behavioral change (Scholer & Higgins, 2012). Given the breadth of this research (reviewed in Higgins, 2012), it is particularly surprising that locomotion has yet to be applied to the study of conflicts and their resolutions.

Current Research

The goal of the present work is to unite these various research fronts by exploring how individual differences in human and nonhuman reconciliation relate to a more fundamental motivation for change. Building on the premise that reconciliation requires a shift from one state to another, and prompted by the paucity of research on individual variation, I sought a framework that was broad and basic enough to make species-general

predictions at the individual level of analysis. Using RMT, a widely validated theory of social and motivational psychology, I propose that locomotion, or an individual's tendency to *move or change from one state to another*, is a significant predictor of reconciliation. In other words, an individual's locomotion motivation can create the *conditions for change*, a key component of the conflict resolution process according to its scholars and practitioners. In exposing this relation, I aim to better connect the social psychological and conflict resolution literatures. Even more broadly, I hope to resume the interdisciplinary discussion on conflict resolution set forth in *Natural Conflict Resolution* (Aureli & de Waal, 2000) by illuminating a construct (locomotion) that is identifiable and measurable across species. In effect, I also highlight RMT as a useful theoretical lens through which to generate novel hypotheses about individual differences in animal behavior.

Unlike prior reconciliation research, which has focused on species, groups, or dyads, my objective in the present set of studies is to hone questions and hypotheses to the level of the *individual*. In both humans and other species, the VRH has generated important relational findings, inconsistencies of which might be further explained by individual differences. At the very least, those differences should be able to explain an additional proportion of the variance in conciliatory tendency. More consistent with that research tradition, however, my aim is not to equate reconciliation phenomena in humans and nonhuman animals, nor to suggest that they entail commensurate behavioral and cognitive complexity. The numerous ways in which such phenomena differ between humans and animals (for one, language) limit the utility (and appropriateness) of these comparisons. But from this diversity, do more universal patterns emerge, and are they

beneficial to our understanding of individual differences in conflict resolution? Using RMT as a theoretical platform, I argue that considering an individual's basic tendency for movement and change is integral to such an understanding.

Beyond being integral, I propose that this relation is rather fundamental—and if so, should be evident across species. Reconciliation was once deemed a “natural phenomenon” (Aureli & de Waal, 2000), necessitating cross-disciplinary approaches to provide further evidence for the continuity of behavioral mechanisms for conflict regulation. The current research builds on that theme by identifying a common motivation that might underlie reconciliation in humans and nonhuman primates, namely the motivation to switch between different states. I investigate the role of locomotion in post-conflict behavior in both humans and chimpanzees (*Pan troglodytes*)—the former enabling access to subjective states, streamlining the validation and refinement of theoretical associations, the latter allowing for environmental control and repeated behavioral observation, facilitating long-term data collection. This work is divided into two major sections, chimpanzee (Section I) and human (Section II) research. The first section provides original evidence for stable individual differences in chimpanzee reconciliation tendencies. Using a long-term dataset comprising over 2,000 post-conflict observations, and controlling for a range of relational (e.g., opponent affiliation) and situational (e.g., conflict intensity) characteristics, this study establishes that individuals explain a significant, additional portion of the variance in conciliatory tendency. These tendencies are then related to several behavioral proxies of locomotion motivation, reflecting how often and how quickly an animal tends to switch states more generally. The second section presents a series of five studies establishing a relation between the

predominance of a person's locomotion motivation and his or her overall motivation to reconcile. The first two studies present participants with hypothetical conflict scenarios to examine how chronic (Study 1) and experimentally induced (Study 2) individual differences in locomotion predominance influence a person's motivation to reconcile. The next two studies examine this relation by way of people's own conflict experiences, both through essay recall of previous conflict events (Study 3) and verbal narratives of ongoing conflict issues (Study 4). The last study examines this association in the context of real-world conflict discussions between roommates (Study 5). Finally, a discussion of this work will integrate Sections I and II, proposing future directions and interdisciplinary applications across both humans and nonhuman primates. Such a comparative approach is particularly instrumental to the current research program in its capacity to highlight basic principles and mechanisms potentially regulating conflict resolution. For a phenomenon as ubiquitous as conflict, illuminating the motivational underpinnings of reconciliation could give rise to general projections about its occurrence and frequency in humans and other social animals.

SECTION I. CHIMPANZEE RESEARCH¹⁰

¹⁰ **Original publication:** Webb, C. E., Franks, B., Romero, T., Higgins, E. T., & de Waal, F. B. M. (2014). Individual differences in chimpanzee reconciliation relate to social switching behaviour. *Animal Behaviour*, *90*, 57–63.

Stable individual differences in animal behavior, often termed ‘animal personalities,’ are the focus of a large and growing body of recent research (Sih, Bell, & Johnson, 2004; Dingemanse & Réale, 2005; Bell, Hankison, & Laskowski, 2009). Such differences are manifest in evolutionarily meaningful patterns such as activity, mating, feeding, predation, and sociality, ultimately translating into important fitness consequences for the individual (Sih, Bell, Johnson, & Ziemba, 2004).

Conflict and post-conflict repertoires are a social domain in which individual differences remain relatively unexplored. Reconciliation, first defined by de Waal and van Roosmalen (1979) as interopponent post-conflict affiliation, represents an evolved strategy to preserve the benefits (and minimize the costs) of conflict-inherent group life. The number of animal species in which reconciliation has been reported continues to grow—most recently extending to canids (Cools, Van Hout, & Nelissen, 2008; Cordoni & Palagi, 2008) and corvids (Fraser & Bugnyar, 2011). The centrally assumed motivational switch underlying this behavior allows individuals to overcome hostility and repair social relationships (de Waal, 2000). Accordingly, the Valuable Relationships Hypothesis (VRH; de Waal & Aureli, 1997) predicts that reconciliation will be more frequent following conflicts between opponents who derive higher fitness benefits from their relationship (Kappeler & van Schaik, 1992), presuming conflicts actually disrupt such relationships (Aureli et al., 2002). The VRH been substantiated by both observational (reviewed in Watts, 2006) and experimental research (Cords & Thurnheer, 1993) across various nonhuman primate species. Given this *relational* emphasis, we know much less about stable *individual* tendencies that might also influence reconciliation’s occurrence.

Recent work by Seyfarth, Silk, & Cheney (2012) demonstrates that other aspects of primate sociality are influenced by stable individual differences, in turn impacting an animal's fitness. In a principle component analysis of female baboon behavior, researchers identified several personality styles to be associated with multiple measures of reproductive success. These individual dimensions influenced the strength and stability of social bonds (critical to fitness in this species: Silk et al., 2010), accounting for variance beyond that explained by kinship and dominance rank. In addition to 'social personality' traits (see also Koski, 2011), primate personality research has adopted diverse psychological approaches ranging from bold-shy continua (Wilson, Clark, Coleman, & Dearstyne, 1994) to five-factor models (reviewed in Freeman & Gosling, 2010) to the use of more recent motivational frameworks such as promotion/prevention orientations (Franks et al., 2013). Building on this work, the primary goal of the present study was to identify whether there are stable individual differences in reconciliation, controlling for other social variables known to influence its occurrence. If stable individual variation in reconciliation is indeed present, subsequent research might then consider including conciliatory tendency as a component of broader animal personality.

The human personality literature typically describes forgiveness, which also relies on a fundamental switch that occurs between opposing motivational states in post-conflict interactions (McCullough et al., 1997). Given how central an assumption this motivational shift between states is for reconciliation (de Waal, 2000), it could be that a more basic and general motivation for change underlies this behavior. In particular, Regulatory Mode Theory (RMT; Kruglanski et al., 2000; Higgins et al., 2003) describes individual variation in locomotion motivation, a tendency for movement (and fast

initiation of change) from state-to-state. As such, the secondary goal of the present study was to test whether RMT can help explain how individual variation in reconciliation may relate to more fundamental individual differences in motivation, namely the motivation to switch between different social states. It bears repeating that we refer to locomotion not as the biomechanics of animal movement, but as a motivational style, heretofore demonstrated in humans across a wide range of research domains (Higgins, 2012). Preliminary evidence (Section II) reveals that people with strong locomotion motivation have higher and faster conciliatory tendencies following interpersonal conflicts. Indeed, recent work has extended psychological theories developed in relation to human personality to stable individual variation in animal behavior (e.g., Uher, Asendorpf, & Call, 2008). Franks and colleagues (Franks, Higgins, & Champagne, 2012; Franks et al., 2013) have recently validated the use of similar motivational models (Higgins, 1997) in the study of personality differences across species (reviewed in Franks & Higgins, 2012).

We used a long-term dataset of chimpanzee conflict and post-conflict behavior to: (1) establish if individual differences in reconciliation were present and importantly, stable across time and situations (i.e., as a possible constituent of broader animal personality), and (2) examine the relation between these differences and three behavioral measures of locomotion motivation (hereafter, social switching behavior). Our first prediction was that stable individual variation in post-conflict behavior would be present when controlling for a number of other variables shown by previous studies to influence reconciliation (such as kinship, dominance, and affiliation level). RMT provided a conceptual framework for our second prediction that individuals with higher conciliatory tendencies would exhibit more social switching behavior. Overall, both the long-term

nature and large sample size of the current dataset make it a particularly good candidate for exploring these patterns and the stability of individual differences over time—especially given the high number of observations on spontaneously occurring behaviors. Though a number of past studies have reported different individual reconciliation rates (e.g., Preuschoft, Wang, Aureli, & de Waal, 2002), to our knowledge ours is the first quantitative overview of that variation, and an initial step in determining how it relates to a more basic tendency to switch between states.

METHOD

Subjects and Housing

Subjects were 31 adult and adolescent chimpanzees (*Pan troglodytes*), socially housed at the Field Station of the Yerkes National Primate Research Center located in Atlanta, Georgia. Two separate groups (FS1 and FS2) had access to indoor areas and large outdoor compounds (750 m² and 520 m², respectively) equipped with visual barriers, a variety of climbing structures, and enrichment toys. Food and water were available *ad libitum*.

Group demographic compositions varied throughout the study period as a result of births, deaths, and removals. At any given time, both groups comprised multiple adult males and at least twice as many adult females. Our analyses were limited to conflicts in which at least one of the opponents was 8+ years old, resulting in 9 male and 22 female subjects. Adults/adolescents had to be involved in >12 observed conflicts throughout the study period in order to be included as a subject. A more detailed description of the study subjects can be found in Romero and de Waal (2010, Table 2).

The Yerkes National Primate Research Center is accredited by the American Association for the Accreditation of Laboratory Animal Care. All procedures were approved by the Institutional Animal Care and Use Committee of Emory University and were conducted in accordance with the Animal Behavior Society's "Guidelines for the treatment of animals in behavioural research and teaching."

Observations

The data analyzed in the present study were collected between 1992 and 2000 for FS1 and 1994 and 2000 for FS2. Throughout that time, controlled observation sessions were conducted approximately once per week in both study groups by the same trained research technician, Mike Seres (see de Waal, 1989 for details). During these 90-minute sessions, all-occurrences of agonistic interactions (defined by at least one the following behaviors: tug, brusque rush, trample, bite, grunt-bark, shrill-bark, flight, crouch, shrink/flinch, or bared-teeth scream; de Waal & van Hooff, 1981; van Hooff, 1974) were recorded, as well as affiliative interactions (kiss, embrace, groom, touch, finger/hand in mouth, play, and mount). Additionally, observation sessions included scan samples (in 5-minute intervals through 1993 and 10-minute intervals in subsequent years) of state behaviors (e.g., contact sitting).

As the sessions were not designed to study post-conflict interactions directly, formal post-conflict (PC) and matched-control (MC) observations were not conducted. However, because the recordings were continuous, the behavior of opponents following agonistic interactions represents PC data (de Waal & Yoshihara, 1983). For each conflict, the identities of the initial aggressor and recipient of aggression were noted, as was the conflict's intensity (i.e., with or without physical contact). Polyadic conflicts (i.e., those

involving >2 individuals) were divided into dyadic components (de Waal & van Hooff, 1981).

Following the standard PC-MC procedure (de Waal & Yoshihara, 1983), former opponents were observed for a 10-minute PC period, where all subsequent affiliative and agonistic interactions, as well as the initiator, recipient, and timing of those interactions, were recorded. Each PC was paired with an MC of the same duration, recorded on the nearest observation day (always within ± 7 days of the conflict). Periods of at least 10 minutes during which neither opponent was involved in another conflict were selected, *a posteriori*, as MC observations, and used as baseline data for comparison purposes with the PC (see below).

Data Analysis

We analyzed data from a total of 2,146 PC-MC pairs (1,121 for FS1 and 1,025 for FS2). According to the PC-MC method, a PC-MC pair was designated ‘attracted’ if opponents affiliated only or earlier in the PC than in the MC, ‘dispersed’ if the affiliation occurred earlier or only in the MC, and ‘neutral’ if it occurred at the same time in both or in neither the PC nor the MC. In our analyses, attracted dyads indicated the presence of reconciliation while dispersed and neutral dyads indicated the absence of reconciliation. For each subject, we compared the number of attracted, dispersed, and neutral interactions, calculating an individual’s corrected conciliatory tendency (CCT) as follows: $100 * [(attracted - dispersed) / all]$ (Veenema, Das, & Aureli, 1994). As described, in our statistical models, the occurrence of reconciliation accounted for differences between PC and MC observations, and each subject’s CCT included all of the PC-MC

pairs in which s/he was a part. We analyze individual variation from multiple angles, but individual data were treated separately (i.e., never pooled into larger aggregates).

Generalized mixed models (GMMs) were conducted in Stata v11.2 in order to test for consistent individual differences in reconciliation (Gelman & Hill, 2006; Rabe-Hesketh & Skrondal, 2008) while controlling for the relation between reconciliation and various fixed effects (see Table 1 and below for details on model specification). By allowing the intercept of the statistical models to vary by individual chimpanzee (i.e., as a random effect), we can test whether repeated observations of the same subjects over time show greater stability than would be expected by chance. Notably, we can simultaneously account for the influences of various aspects of the social context (i.e., as fixed effects), making such models a valuable yet relatively underused approach for quantifying stable individual differences in behavioral tendency.

Our first model (Model 1) incorporated a crossed random effects structure (Baayen, Davidson, & Bates, 2008) with a binary outcome (0/1 if reconciliation did not/did occur), using a binomial error distribution and logit-link function. The data were structured by conflict (i.e., one line of data per conflict) to enable us to control for the fixed effects of conflict (number of participants, intensity), dyad (sex- and age-class combination, kinship, dominance, affiliation level), and group (FS1 or FS2, group size) characteristics. Conflict opponents were entered as crossed random effects. Kinship was restricted to matrilineal relationships, and only (grand)-mother-offspring and maternal siblings were considered related. Dominance was based on non-agonistic approach/retreat interactions and the direction of submissive signals. Affiliation level was calculated with a combined measure of four state behaviors (contact sitting, sitting within arm's reach,

grooming, and mutual grooming) collected during scans, using the quartile points of dyadic scores for each focal individual. Only dyads with scores higher than the top quartile were considered to have a strong affiliative relationship. Dyadic values for dominance and affiliation were calculated for each year independently. When we found an effect of a 3-level factor (i.e., sex- or age-class) on the occurrence of reconciliation, we ran multiple comparisons between the groups in order to determine their relative effects in Model 1.

A second model (Model 2) sought to further examine the stability of individual differences by collapsing the data for a count of each subject's reconciliations and conflicts by observation year (i.e., one line of data per individual per year). Due to non-normally distributed annual CCT values (such transformation problems—in our case resulting from a preponderance of years when CCTs equaled zero—are well known for count data with small mean frequencies), we modeled a reconciliation count outcome (the number of attracted–dispersed pairs a subject had in a given year), controlling for the number of conflicts (i.e., total pairs) a subject had in that year (entered as a fixed effect) to approximate an individual's tendency to reconcile during that time (Gelman & Hill, 2006; Rabe-Hesketh & Skrondal, 2008). A generalized multilevel model with a Poisson error distribution and logit-link function was performed, with subject entered as a random effect. Additionally, subject sex and age, as well as group characteristics (social group and group size) were entered as fixed factors (Table 1). Overall, in Model 2, in which we extracted information concerning the interaction for each subject, individual subjects formed the unit of analysis, whereas in Model 1, in which each conflict is considered independently, the opponents therein formed the unit of analysis.

Table 1. Description of variables used in GMMs in Models 1 & 2.

Model	Variable	Description
Outcome: Reconciliation		
1	Binary	Occurrence of reconciliation (0=No, 1=Yes)
2	Count	Subject # of attracted–dispersed pairs (per year)
Random Effect: Individual		
1	Opponent x Opponent	Crossed random effects structure
2	Subject	Regular random effect structure
Fixed Effects:		
1	Participants	Conflict # of participants
1	Intensity ^a	Conflict intensity (0=Non-physical aggression ^b , 1=Physical aggression)
1	Kinship ^a	Dyad kinship (0=Not kin, 1=Kin)
1	Dominance ^a	Dyad dominance (0=Unequal, 1=Equal)
1	Affiliation ^a	Dyad affiliation (0=Not strong, 1=Strong)
1	Sex-class	Dyad sex-class (All-Male, Mixed-Sex ^c , All-Female)
1	Age-class	Dyad age-class (All-Adult, Mixed-Age ^c , All-Adolescent)
1,2	Group	Social group (0=FS1, 1=FS2)
1,2	Group size	Social group size
2	Sex	Subject sex (0=Male, 1=Female)
2	Age	Subject age-class (0=Adolescent, 1=Adult)
2	Conflicts	Subject # of conflicts (per year)

^a See also Romero, Castellanos, and de Waal (2011) for details on variable measurement and calculation

^b Corresponds to ‘low’ in Romero et al. (2011)

^c Reference groups

A third set of analyses tested predictions regarding individual CCT and three measures of social switching behavior. The first, *social behavior switches*, equals the number of different behaviors that a subject initiated towards another individual over the observation session. All social (i.e., affiliative and agonistic) behaviors were taken into

account. An event was also counted as distinct if the subject engaged in the same behavior but with a different individual. For instance, if A groom B was followed by A groom C, the total number of events was two. The second index, *social partner switches*, equals the number of different individuals towards which a subject directed any behavior over the observation session. In this case, the number of interactions with each individual was not taken into account. Both indices are expressed as rates per hour and were calculated for each year independently. Finally, an animal's *latency to reconcile* was calculated as the number of seconds that took place between the end of the conflict and the onset of reconciliation, averaged for each observation year, and then log-transformed for normality. We used the two frequency indices as estimations of the overall rate at which individuals switched between different social states, and latency as an indicator of how quickly they did so. Beyond testing our predictions by entering each variable into Model 2 as an additional fixed effect, we compared these measures—averaged across all observations—directly to an individual's mean CCT by collapsing the data by subject (i.e., one line of data per individual). The latter analyses were conducted via separate multiple linear regressions for each variable, entering subject CCT (normally distributed upon collapsing) as the outcome and controlling for subject group, sex, and age at the conclusion of the study period.

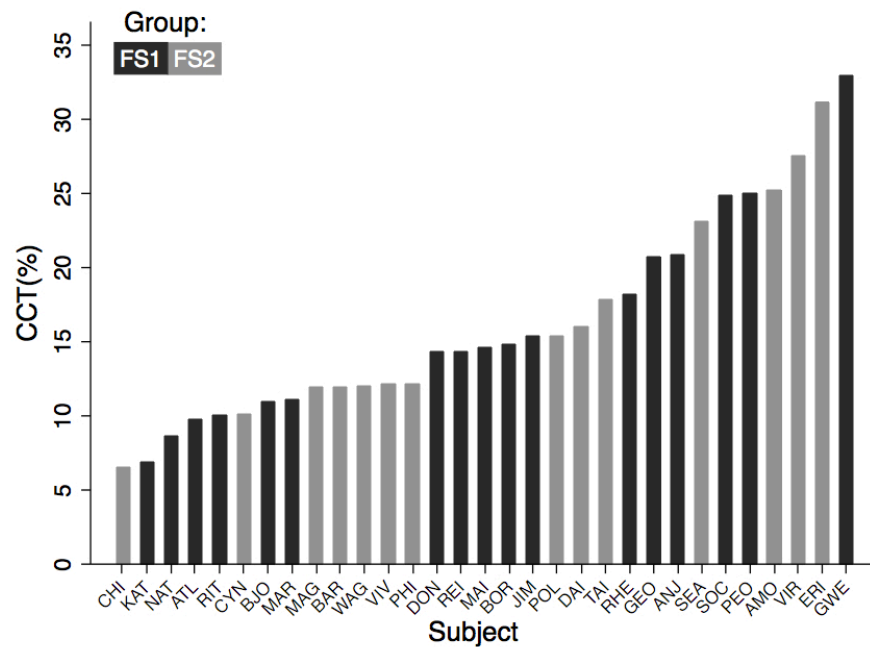
RESULTS

Individual Differences

The mean \pm SD CCT of all 31 individual subjects was 16.3% \pm 7.0%. We found substantial individual variation, such that subject CCTs ranged from 6.5% to 32.9%

(Figure 1). Testing this variation, Model 1 revealed a significant crossed random effect of opponents (likelihood ratio test: $LRT = 27.47$, $P < 0.0001$). That is, individuals differed reliably in their level of reconciliation while controlling for a variety of other factors shown by previous research to affect this behavior (Table 2). According to Model 1 results, between-individual heterogeneity was relatively high for both opponents, such that the variances for both intercepts were large relative to their standard errors.

Figure 1. Mean corrected conciliatory tendency (CCT) per subject.



Opponent affiliation was also a predictor of reconciliation, indicating that strongly affiliated dyads reconciled significantly more than dyads with weaker affiliation levels. Further, all-female dyads reconciled significantly more than mixed-sex dyads (showing a similar trend when compared to all-male dyads; $\beta = 0.43$, $P = 0.165$) and all-adult and all-adolescent dyads reconciled significantly more than mixed-age dyads (there were no significant differences between all-adult and all-adolescent dyads; $\beta = 0.64$, $P = 0.332$).

Additionally, conflicts involving physical aggression were reconciled significantly more than those involving non-physical aggression. Neither the number of conflict participants nor the number of available social partners (i.e., social group size) significantly predicted reconciliation. We found no significant between-group differences, nor influence of kinship or dominance, on the occurrence of reconciliation.

Table 2. Results of Model 1. Conflict opponents were crossed (random effects) to model the presence/absence of reconciliation (outcome) controlling for conflict, opponents' relationship, and group characteristics (fixed effects).

<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Test statistic</i>	<i>P</i>
Random Effect				χ^2	
Opponent 1	0.447	0.104	0.283 — 0.707	27.47	0.000
Opponent 2	0.403	0.102	0.245 — 0.662		
Fixed Effects				<i>Z</i>	
Participants	0.001	0.094	-0.184 — 0.186	0.01	0.992
Intensity	0.296	0.136	0.029 — 0.563	2.18	0.030
Kinship	-0.014	0.412	-0.820 — 0.793	-0.03	0.974
Dominance	-0.305	0.392	-1.073 — 0.463	-0.78	0.437
Affiliation	0.619	0.141	0.342 — 0.897	4.38	0.000
Sex-class					
All-Male	0.208	0.215	-0.214 — 0.630	0.97	0.334
All-Female	0.647	0.201	0.253 — 1.041	3.22	0.001
Age-class					
All-Adult	0.718	0.166	0.392 — 1.043	4.32	0.000
All-Adolescent	1.357	0.644	0.095 — 2.619	2.11	0.035
Group	0.041	0.268	-0.484 — 0.566	0.15	0.878
Group size	0.003	0.075	-0.144 — 0.151	0.04	0.968

After uncoupling the data for each subject per observation year, the results of Model 2 demonstrated a significant random effect of subject (LRT = 22.56, $P < 0.0001$), indicating that even when the data are structured by year, individuals are highly stable in their reconciliation tendencies (Table 3). Importantly, this result is reported controlling for the number of conflicts that a subject encountered in a given year—which, unsurprisingly, positively predicted the number of reconciliations he or she had. Consistent with Model 1 results, we found no significant effect of group or group size on subject reconciliations. We also found no significant differences depending on subject sex or age.

Table 3. Results of Model 2. Subject was entered as a random effect in order to model its annual reconciliation total (outcome) controlling for its annual conflict total, sex, and age-class, in addition to group characteristics (fixed effects).

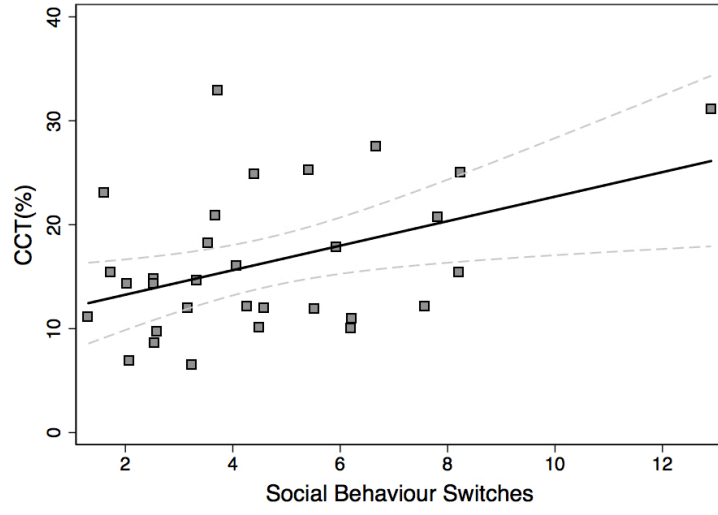
<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Test statistic</i>	<i>P</i>
Random Effect				χ^2	
Subject	0.365	0.081	0.237 — 0.562	22.56	0.000
Fixed Effects				<i>Z</i>	
Group	0.175	0.175	-0.167 — 0.517	1.00	0.316
Group size	-0.054	0.061	-0.174 — 0.065	-0.89	0.374
Sex	-0.257	0.198	-0.645 — 0.131	-1.30	0.194
Age	0.052	0.160	-0.261 — 0.366	0.33	0.744
Conflicts	0.024	0.003	0.019 — 0.030	8.34	0.000

Social Switching Behavior

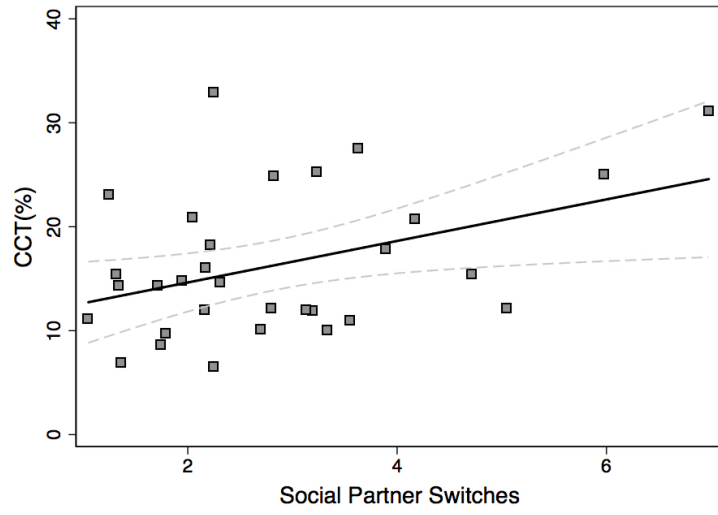
Associations were first determined between an individual's mean CCT and his or her average rate of social behavior switching, social partner switching, and overall latency to reconcile (respectively, mean \pm SD: 4.59 ± 2.54 behavior switches/hour; 2.84 ± 2.32 partner switches/hour; latency of 155.40 ± 60.85 seconds). We found a significant positive relation between individual CCT and social behavior switching ($\beta = 1.24$, $P = 0.027$), indicating that subjects who reconciled more tended to switch between different social behaviors at a higher rate (Figure 2a). We also found a significant positive relation between individual CCT and social partner switching ($\beta = 2.22$, $P = 0.037$), such that subjects who reconciled more tended to switch between different social partners at a higher rate (Figure 2b). Further, there was a significant negative association between CCT and average latency to reconcile ($\beta = -5.15$, $P = 0.023$), indicating that subjects who reconciled more did so more quickly (Figure 2c). Notably, all three relations were also significant when entered as separate fixed effects into Model 2 (social behavior switches: $\beta = 0.12$, $P < 0.001$; social partner switches: $\beta = 0.21$, $P < 0.001$; latency to reconcile; $\beta = -0.10$, $P = 0.042$), demonstrating their stability over time.

Figure 2. Relation between subject mean corrected conciliatory tendency (CCT) and average (a) social behavior switches; (b) social partner switches; (c) latency to reconcile (note that the X -axis is log-transformed). The solid lines are trend lines and the dashed lines denote 95% confidence intervals.

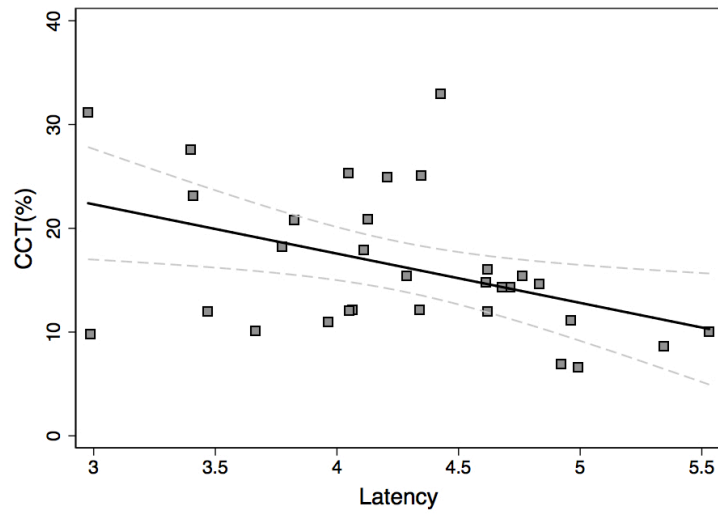
(a)



(b)



(c)



DISCUSSION

Both Models 1 and 2 support our key hypothesis that chimpanzees exhibit stable individual variation in conciliatory tendency. Whereas Model 1 (structured by conflict) allowed us to control for characteristics of the opponents' relationship, Model 2 (structured by subject) allowed us to control for individual characteristics. We found that, after statistically accounting for these and other potential variables, opponents still exhibited stable individual differences in reconciliation (Model 1), and subject CCTs were consistent from one observation year to the next (Model 2). Accordingly, these models revealed individual variation as an important predictor of post-conflict behavior, above and beyond associations established in previous studies.

The affiliation level between opponents was also a predictor of reconciliation. Though this general pattern is consistent with the VRH and previous findings in chimpanzees (e.g., Watts, 2006), other results are less clear. Given the value of chimpanzee male alliances, one might expect reconciliation to be highest in all-male dyads—as indeed reported by de Waal (1986)—although evidence for this pattern is mixed (reviewed in Watts, 2006). That all-female dyads reconciled more than other pairs (though the difference only reached statistical significance when compared to mixed-sex dyads) could reflect the unusually strong female bonds in the Yerkes groups (Preuschoft et al., 2002), further promoted by having over twice as many female than male subjects. Although past research has typically investigated dyad sex- rather than age-class combination differences, our result demonstrating higher reconciliation among similarly-aged social partners may be indicative of compatibility, an additional component of relationship quality (Cords & Aureli, 2000). Our further finding that conflicts with

physical aggression were reconciled more often than those with no physical aggression follows inconclusive evidence in chimpanzees (*cf* Kutsukake & Castles, 2004; Koski, Koops, & Sterck, 2007), suggesting that it would be useful for future research to explore potential interaction effects (Koski, de Vries, van den Tweel, & Sterck, 2007).

More central to the aims of our research, we also found a relation between individual differences in CCT and three separate measures of social switching behavior. We confirmed that subjects with higher CCTs had higher average rates of social behavior switching and partner switching, and lower mean latencies to reconcile. All three describe locomotion motivation—a more general tendency to initiate, and initiate quickly, movement from state-to-state (Kruglanski et al., 2000; Higgins et al., 2003). Because reconciliation itself constitutes a motivational shift from one state to another, locomotion motivation was a particularly appropriate general construct for addressing this variation. Our findings suggest that stable individual differences in reconciliation may relate to an underlying motivation to switch between different social states. It is worth noting that an individual’s motivation to reconcile (as for other social phenomena) may be difficult to measure, as both partners must be motivated in order for the interaction to occur. While a measure of the motivation to reconcile would ideally include unsuccessful reconciliation ‘attempts’ (i.e., when individuals attempted to reconcile but their partners did not reciprocate), we are aware of no studies to date that have collected such a measure. In this sense, conciliatory tendency serves as a proxy for the motivation to reconcile. Given this conservative estimate, we still found compelling support for our predictions. We encourage future work to include such unsuccessful efforts to interact with social partners (not only when studying reconciliation, but other social behaviors, e.g., grooming) for a

better evaluation of social motivation. Along with the results presented here, such studies can reveal the potential utility of motivational frameworks in exploring the underpinnings of various tendencies, and highlight novel interpretations of consistent individual differences in animal behavior. Beyond advancing a motivational approach to behavior, however, we hope our study serves as a catalyst for determining other predictors of stable individual differences in reconciliation.

As a social behavior that exhibits considerable individual consistency across both time and context, reconciliation warrants integration with the animal personality research. For example, sociability, generally defined as the tendency to tolerate and seek interactions with conspecifics, is a relevant personality dimension to post-conflict behavior. Koski's (2011) sociability factor in captive chimpanzees consisted of behaviors important in the formation and maintenance of social relationships (e.g., grooming and seeking/accepting social proximity). Nevertheless, additional factors (labeled positive affect and equitability) comprised other socio-positive behaviors. Accordingly, in primates and other socially complex species, sociability is not unidimensional but likely encompasses many different traits (Koski, 2011). In this regard, understanding how suites of traits correlate as behavioral syndromes (Sih, Bell, & Johnson, 2004) may benefit from the incorporation of additional aspects of an individual's sociality, namely its conciliatory tendency.

Beyond establishing the stability of individual differences, the role of individual plasticity in conflict and post-conflict phenomena provokes further inquiry. More recent emphases in personality research have been placed on phenotypic plasticity, noting that individuals differ not only in their average level of behavior, but also in their

responsiveness to environmental variation (i.e., ‘behavioral reaction norms;’ Dingemanse, Kazem, Réale, & Wright, 2010), particularly in the social realm (Bergmüller & Taborsky, 2010; Réale & Dingemanse, 2010). If social switching behavior is suggestive of such social behavioral flexibility (or ‘social sensitivity:’ Sih & Bell, 2008; Sih, 2013) more broadly, we can generate hypotheses about whether individuals with higher conciliatory tendencies would exhibit more plasticity in reconciliation. Investigating the shapes of behavioral reaction norms as a function of various social contexts (e.g., across different social partners) therefore represents an important next step. With respect to our earlier point, one could investigate whether an individual’s motivation to reconcile is directed preferentially at those partners who are most likely to reciprocate. If such regulated expression optimizes an individual’s relationships, conciliatory behavior would therefore represent a novel domain in which to evaluate social competence (Taborsky & Oliveira, 2012). How both the consistency and plasticity of reconciliation reflect and influence other aspects of sociality, such as the nature of an individual’s social bonds or network position, are additional considerations for future research.

CONCLUSIONS

Reconciliation is conceptually rooted in a relational discourse, notably that of the VRH. We have established that beyond relationship value, stable individual differences represent an additional and potentially meaningful source of variation in conciliatory tendency. Despite conflict being a pervasive and potentially disruptive element of sociality in primates and other gregarious species, post-conflict behavior has not been a

focus of animal personality research. Though often less intuitive to approach the study of sociality from the individual level of analysis, individual differences influence how social processes themselves unfold. To the extent that those differences in part drive the formation and maintenance of social relationships, they have more ultimate consequences. In particular, insofar as an individual's conciliatory tendency shapes or reinforces the strength and stability of its social bonds, it can also impact its fitness. Though this remains an open question, our findings suggest a relatively unexplored area of research warranting further study.

SECTION II. HUMAN RESEARCH

The inevitability of interpersonal conflict is now a generally accepted and well-studied premise. Conflict resolution has concurrently emerged as a related field of scientific inquiry and research. Driven by the ever-pressing need to understand *human* motives for mitigating conflict, the field aims to identify the conditions under which opposing parties achieve resolutions. Consistent with that tradition, our responses to conflict have largely been conceptualized as means towards (or away from) obtaining desired ends (such as restored relations or newly distributed resources); that is, they have been treated as instrumentally motivated. What has not received sufficient attention is the additional possibility that our responses to conflict are not simply instrumentally motivated in this way. This in turn raises the possibility that—for some individuals or in some situations—post-conflict tendencies are not merely in the service of resolutions, but in the service of other and perhaps more fundamental motivations.

What are these more fundamental motivations? Turning to the conflict resolution literature itself, there is a general consensus that resolving conflicts necessitates *change*. Researchers and practitioners alike frequently make implicit (and at times explicit) references to the role of change in conflict resolution processes. In the *Handbook of Conflict Resolution* (Deutsch, Coleman, & Marcus, 2006), for example, Marcus (2006) states that “one can think of change as an outcome of a constructive or destructive conflict resolution process, and the process of change as a series of conflict resolution activities that lead to some new (changed) end-state.” Other contemporary scholars in the field have adopted the term ‘conflict transformation’ (Lederach, 1995; Galtung, 1996) to generally describe the complex *set of changes* that is necessary to alter the course of

conflict.¹¹ Researchers have also presented and developed a Lewinian model of change in the context of what makes a conflict ‘ripe’ for resolution (Coleman, 1997; 2000) and the application of dynamical systems approaches (e.g., Coleman, 2006). At the same time, social-psychological research has emphasized the inherence of change to specific post-conflict constructs such as forgiveness and reconciliation. In particular, McCullough and colleagues' (1997; 1998) widely-cited definition of forgiveness characterizes it as the suite of *motivational changes* that occurs following a transgression whereby the victim becomes less motivated by avoidance and revenge and more motivated by benevolence. Likewise, de Waal's (2000) use of the term reconciliation (often to describe post-conflict affiliation between former opponents in nonhuman animals)^{12,13} relies on a centrally assumed *motivational shift* wherein fear and hostility make way for a more positive inclination.

Despite in some cases rather limited disciplinary overlap, these different examples share a key interdisciplinary theme: motivational change and movement between states are the core of conflict resolution. Evidence for this association between a broader individual motivation for change and reconciliation has been found in one of our nearest

¹¹ We do not elaborate on the present-day distinction between the terms ‘conflict resolution’ and ‘conflict transformation,’ but see Mitchell (2002) and Botes (2003) for useful commentaries.

¹² As primatologists define it, reconciliation involves post-conflict behavioral affiliation, which functions to repair or improve the relationship between former opponents (but see Cords, 1993 for a discussion of how operational definitions differ from functional ones). In humans, it should be reemphasized that the function of reconciliation is similar, but the means by which it is achieved is clearly not limited to overt behavioral interactions.

¹³ It should also be noted that the term ‘reconciliation’ in humans typically refers to a much broader and more complex set of peacebuilding processes (see Lederach, 1997). For the purposes of the research presented in Section II, we define reconciliation simply as a motivation to engage in friendly relations with recent conflict partners.

nonhuman primate relatives (Section I; Webb, Franks, Romero, Higgins, & de Waal, 2014), suggesting its fundamental nature. Yet in spite of numerous conceptual claims, there have yet to be specific, empirical investigations of this important relation in humans (but see: McCullough, Bono, & Root, 2007). And although the motivation for change represents a theoretical principle across disparate literatures and fields, when it comes to the potential role of individual differences, the discussion has typically not been grounded in relevant theory. Remarkably, no formal theories of human motivation have been employed to understand the relation between a stable *individual* motivation for change and conflict resolution, but an appropriate framework does exist.

Namely, Regulatory Mode Theory (RMT) describes variation in locomotion, a motivation for movement and change from state-to-state, *for making things happen* (Kruglanski et al., 2000; Higgins, Kruglanski, & Pierro, 2003; Higgins, 2012). Locomotion can vary across people both as a chronic individual difference (see Kruglanski et al., 2000) and as an induced momentary state (see Avnet & Higgins, 2003). Returning briefly to the proposition that the resolution of conflict can be partially achieved via non-instrumental means, a motivation for locomotion regards change as *an end in itself*. In other words, rather than a means toward a particular outcome, the essential nature of locomotion is change away from a current state for its own sake. Specifically, in conflict situations, *the motivation to change the current state through resolution can be intrinsically motivated—an end in itself—when an individual has a locomotion motivation*. Consistent with field theory (see Lewin, 1951; Deutsch, 1968), locomotion can be manifest in any region within the life space, whether behavioral or psychological. Thus, the primary concern of this motivational system is simply to move

in an experiential sense. Given the centrality of that particular experience to conflict transformation, locomotion could thus represent a more fundamental motivation underlying the resolution of interpersonal conflict.

In addition to a self-regulatory emphasis on initiating movement and change, RMT posits an orthogonal motivational emphasis on making critical comparisons and evaluations (i.e., *assessment*). Building on classic theories of self-regulation (e.g., Carver & Scheier, 1990), RMT treats locomotion and assessment as functionally independent, such that individuals can differ habitually or temporarily in their relative emphasis on one mode over the other. Unlike locomotion individuals (for whom change is an end in itself), people in the assessment mode value the process of appraisal as an end in itself (Higgins et al., 2003). Prior research has shown that these modes exemplify a trade-off between speed and accuracy—while locomotors prioritize speed in the service of *getting things done*, assessors prioritize accuracy in the service of *getting things right* (Kruglanski et al., 2000; Mauro et al., 2009). However, this assessment desire can yield negative outcomes such as procrastination (Pierro, Giacomantonio, Pica, Kruglanski, & Higgins, 2011). Further, the assessment tendency for critical evaluation can lead to counterfactual thinking and regret (Pierro et al., 2008), which despite clear implications for conflict resolution, has never been studied in this context.¹⁴ Thus, in conflict situations, while locomotion is primarily concerned with moving from a current state to a changed end-state, assessment is primarily concerned with critically evaluating the current state in

¹⁴ These and other studies highlight that the assessment motivation to get things right, if left unchecked (i.e., in the absence of any locomotion motivation), can have detrimental effects in certain cases of goal-pursuit. Together this research reveals that assessors will value accuracy even at the expense of speed, and will take the time to figure things out by engaging in counterfactual thinking, even if it leads to greater regret and procrastination.

reference to the desired end-state, in order to understand the best or right way to proceed. This primary concern can have secondary consequences, in that constant assessment (in the absence of locomotion) may leave people confined to the current state (Avnet & Higgins, 2003). Indeed, assessors have a tendency toward stasis over dynamic action and change (Kruglanski, Pierro, Higgins, & Capozza, 2007; Mannetti, Giacomantonio, Higgins, Pierro, & Kruglanski, 2010), potentially creating corresponding repercussions for conflict resolution. Namely, when confronted with such situations, *in their constant critical evaluation of potential actions in search of the right one, people with strong assessment concerns can become entrenched in the current state of conflict.*

In Section II, we advance the notion that peoples' responses to conflict go well beyond instrumental motivations, and take seriously the idea that motivational change from one state to another is an essential theoretical consideration for human conflict resolution research. On those grounds, we seek to highlight the appropriateness of constructs like locomotion and assessment when it comes to conflict; motivational ends in themselves which have direct implications for resolutions. In this sense, *resolving conflict is not merely regarded as a means to a valuable end, but as a motivational response that is in the service of locomotion or assessment concerns.* RMT thus suggests a new and untold story regarding potential response mechanisms for conflict resolution.

As a theory of self-regulation with broad applicability, RMT has been employed across a range of disciplines (see Higgins, 2012). Prior research, however, has never examined RMT's implications for human conflict resolution. In investigating this link, the present work will also contribute to our understanding of *individual differences* in conflict resolution, which is largely inconclusive and incomplete (see Lewicki, Litterer,

Minton, & Saunders, 1994). Because conflict is an inherently inter-individual phenomenon, studies have commonly focused on relational or situational characteristics of resolutions over stable individual predictors (akin to the nonhuman animal literature, as highlighted earlier). A notable exception is recent work on the role of dispositional factors in forgiveness (reviewed in McCullough, 2001), much of which has emphasized personality dimensions such as the Big Five (McCrae & Costa, 1999; e.g. McCullough & Hoyt, 2002). Given the *motivational* nature of forgiveness (e.g. McCullough et al., 1997) and conflict resolution phenomena more generally, it is perhaps also surprising that self-regulatory frameworks have rarely been applied in this context (but see Mischel, DeSmet, & Kross, 2006). Recent studies applying Regulatory Focus Theory (RFT; Higgins, 1997) have begun to break this pattern (e.g. Santelli, Struthers, & Eaton, 2009; Molden & Finkel, 2010; Winterheld & Simpson, 2011), suggesting the further promise of employing related motivational frameworks such as RMT.

The independence of the locomotion and assessment modes allows them to be studied as separate motivational dimensions (each from low to high strength) or collapsed into a single dimension of *regulatory mode predominance*. Following conflict situations, locomotion and assessment impose competing forces on an individual: an individual either is pulled away from the current state of conflict in the service of change, i.e., ‘getting on with it’ (locomotion), or is pulled toward it in the service of increased evaluation and understanding, i.e., ‘getting to the bottom of it’ (assessment). Because these motivational forces act in opposition to one another in their influence on what a person decides to do (i.e., these modes *themselves* are in conflict), we focus on the implications of their *relative* strength for conflict resolution. More specifically, while

both motivational systems are certainly necessary for effective goal-pursuit, *in the context of conflict*, we argue that locomotion's predominance over assessment is essential, given the inherence of change to conflict resolution processes. Assessment's motivation for critical evaluation (particularly in undesirable situations like conflict) could, in fact, potentially fuel more negativity in the absence of any locomotion, diminishing peoples' motivation to move forward. Thus, while locomotion as an end in itself could theoretically lead to a variety of conflict outcomes, we argue that, relative to assessment, it actually serves to facilitate change in conflict situations in ways that are conducive to resolutions. However, on this point we will let the research speak for itself.¹⁵

In Section II, five studies using diverse methodologies and measures are presented in order to examine the role that regulatory mode plays in human conflict resolution. Our general hypothesis is that the predominance of locomotion over assessment will facilitate a non-instrumental motivation to move past conflict. If change is an end in itself for those in a predominant locomotion state, then the motivation to move on should be achieved in its service, regardless of the negativity that conflict generates. In the first two studies, we investigate this premise using hypothetical conflict scenarios, both when predominance is studied as a chronic individual difference (Study 1) and as an experimentally-induced state (Study 2). In Study 3, we determine whether the results of these studies translate to peoples' recollections of their own real-life conflicts, and explore differences in the particular conflict strategies they employ. We then consider the role of locomotion

¹⁵ On this point it is also worth mentioning that while the question under study most warrants a regulatory mode predominance approach, we have included supplementary analyses (Appendix C) to illustrate the relative effects of locomotion and assessment strength. These analyses provide empirical evidence supporting our theoretical reasoning for emphasizing predominance.

predominance when people reflect upon *ongoing* difficult conflicts, affording the important opportunity to examine the emotional experiences that are present (Study 4). In Study 5, we examine the more dynamic effects of regulatory mode by prompting conflict discussions between roommates. This approach allowed us not only to analyze how stable individual variation in locomotion and assessment influenced relational effects, but also to determine the extent to which behavioral responses during actual conflicts provided converging evidence with the results of Studies 1-4.

Study 1

In this study, we presented participants with various interpersonal conflict scenarios in order to examine how individual differences in regulatory mode predominance influence post-conflict motivations and feelings. Consistent with the idea that locomotion predominance should move individuals away from the current conflict state (i.e., in the service of change), we predicted that it would be associated with 1) higher motivation to resolve conflict situations; 2) lower negative emotions in relation to conflict situations; and 3) decreased influence of those emotions on the overall motivation to reconcile. Specifically, we reasoned that if locomotion predominates, the motivation to reconcile should be maintained regardless of how participants ‘feel’ about the conflict; i.e., the motivation for *getting it done*. On the other hand, as locomotion predominance weakens, assessment would increase sensitivity to the way one feels in the service of comparisons, evaluations, and responding in the ‘best’ manner; i.e., the motivation for *getting it right*.

METHOD

Participants

Eighty-nine students (23 men, 66 women) from the Behavioral Research Lab (BRL) of Columbia's Business School participated for \$5 compensation. Participants' ages ranged from 18-36 ($M = 23.35$, $SD = 4.19$). Because the difference in locomotion predominance scores between males ($M = 0.01$, $SD = 1.08$) and females ($M = 0.42$, $SD = 1.08$) approached significance: $t(87) = -1.55$, $p = .06$, we controlled for sex in the following analyses.

*Materials and Procedure*¹⁶

We measured participants' chronic regulatory mode via the Regulatory Mode Questionnaire (RMQ; Kruglanski et al., 2000). The RMQ consists of 30 items rated on 6-point scales, which have been shown to reliably characterize locomotion and assessment. Sample items for locomotion include: "I feel excited just before I am about to reach a goal" and "When I finish one project, I often wait awhile before getting started on a new one" (reverse-scored); Sample items for assessment include: "I often compare myself with other people" and "I often critique work done by myself and others" (see Appendix A for full scale). Previous research (see Kruglanski et al., 2000; Higgins et al., 2003) has shown assessment and locomotion to be orthogonal or uncorrelated, which was corroborated by the current study, $r(87) = -0.04$, $p = .74$. Consistent with prior research, regulatory mode predominance was calculated as a continuous measure by subtracting

¹⁶ Note: All studies in Section II had trained female experimenters. In each case, prior to beginning the study, experimenters obtained informed consent from participants. The experimenter then facilitated the study procedure described, and provided debriefing forms immediately following the study. In the event that more than one experimenter ran the same study, analyses revealed that experimenter identity had no impact on results.

the assessment subscale ($M = 4.09$, $SD = 0.83$, Cronbach's $\alpha = .86$) from the locomotion subscale ($M = 4.41$, $SD = 0.70$, $\alpha = .83$) of the RMQ. Analyses are based on this difference score ($M = 0.31$, $SD = 1.12$), for which a higher score indicates stronger locomotion predominance.¹⁷

Upon coming to the BRL and completing the RMQ, each participant was presented with six interpersonal conflict scenarios (see Appendix B for all scenarios).

Participants were asked to imagine that they and a friend were engaged in a conflict over a series of issues, for example:

Imagine that you and a friend are having a conflict over differing ideas of how to spend more time together. You have both recently desired 'expanding your horizons' by meeting new people, and think it would be fun and beneficial to your friendship to have these new experiences together. However, it is beginning to feel like you are seeking to widen your social circle in different ways (for example, you are excited about going to museums and art galleries; your friend is excited about going to parties and social events). As a result, your friend is becoming involved in a somewhat different 'scene,' and although makes an effort to include you, realizes that you are not as eager. You make the effort to be inclusive of your friend as well, but feel that he/she is not as enthusiastic. It feels like your mutual goal of wanting to experience new things together and advance your friendship is being thwarted by different ideas on what those experiences should be.

As this particular conflict illustrates, the scenarios did not involve serious offenses or transgressions, but rather conflicts-of-interest (or misunderstandings) that two social partners surmount in the service of their relationship.¹⁸ Nevertheless, in order to account

¹⁷ Across all of our samples, more participants fell along the locomotion predominance dimension than along the assessment predominance dimension (i.e., a higher proportion of participants had positive than negative difference scores). Thus, we refer to stronger versus weaker locomotion predominance (rather than locomotion versus assessment predominance).

¹⁸ As such, there is an analogue between our approach and the concept to which the term reconciliation refers in the animal behavior literature (from McCullough, Kurzban, & Tabak, 2013), a motivation to restore friendly relations, rather than to forgive a transgression.

for the possibility that one partner was conveyed as more responsible, we also switched the ‘roles’ that participants played in half of the conflicts they received. For example, in the scenario above, “you” and “your friend” were switched throughout the paragraph (see Appendix B). After reading each scenario (counterbalanced by participant), participants filled out a short questionnaire consisting of several items (rated on 7-point Likert-type scales) designed to measure their conflict resolution motivations. We were particularly interested in the extent to which participants reported a motivation to resolve the conflict (“I am motivated to reconcile with my partner;” $M = 5.11$, $SD = 1.53$) and their negative emotional experience (“I have negative feelings as a result of this conflict;” $M = 4.65$, $SD = 1.74$).

As participants’ responses to these two items varied significantly by conflict type (motivation to reconcile: $F(5, 440) = 3.86$, $p < .01$, $n_p^2 = .03$; negative feelings: $F(5, 440) = 13.64$, $p < .0001$, $n_p^2 = .09$) and role (motivation to reconcile: $t(87) = -5.90$, $p < .0001$; negative feelings: $t(87) = 2.11$, $p < .05$ —i.e., less motivation to reconcile and more negative feelings when the friend was depicted as responsible compared to the participant), we controlled for both factors in the analyses that follow. After collapsing across all conditions (and controlling for conflict type, role, and participant sex), we investigated whether chronic individual differences in regulatory mode influenced participants’ post-conflict motivations and feelings.

RESULTS

Generalized linear mixed models (grouped by participant) were performed on the data in order to examine responses across the six conflict scenarios. Consistent with our

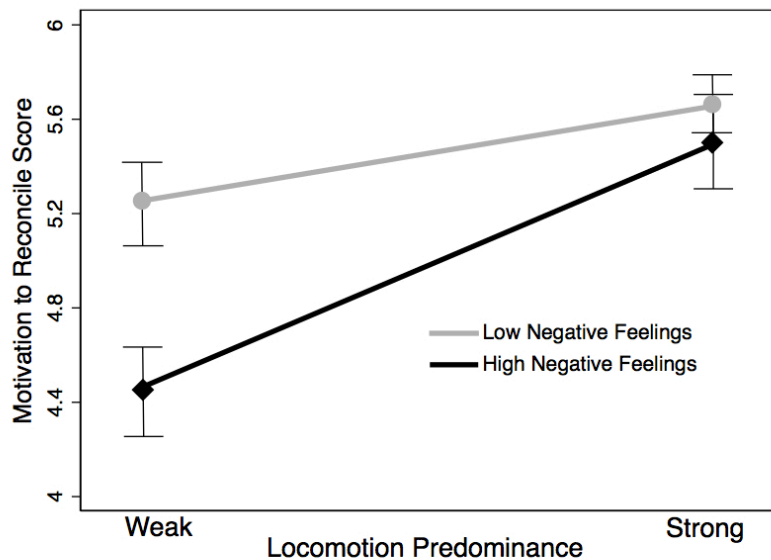
predictions, we found a significant main effect of regulatory mode predominance on the motivation to reconcile ($\beta = 0.26, p < .01$), such that stronger locomotion predominance was associated with increases in the reported motivation to reconcile. Further, we found a significant main effect of regulatory mode predominance on the negative feelings reported in response to the conflict ($\beta = -0.37, p < .0001$), such that stronger locomotion predominance was associated with decreases in negativity. When controlling for negative feelings, the relation between regulatory mode predominance and the motivation to reconcile remained significant ($\beta = 0.21, p < .05$).

We then examined the interaction between participants' chronic locomotion predominance and those negative feelings on the motivation to reconcile. A significant interaction between predominance and negativity ($\beta = 0.17, p < .01$) indicated that as the strength of one's locomotion predominance increased, the less one's negative feelings influenced the motivation to reconcile. As Figure 1 illustrates, individuals with weaker locomotion predominance were more susceptible to negativity influencing their motivation to reconcile—specifically, the motivation to reconcile was diminished at high levels of negativity. In contrast, for individuals with stronger locomotion predominance, even high levels of negativity did not obstruct their motivation to reconcile.

Unsurprisingly, across the entire sample, the higher the negative feelings participants experienced, the less motivated they were to reconcile: $r(87) = -0.16, p < .001$. While this may be the general case, the reported predominance X negativity interaction reveals that an important exception exists in cases when locomotion predominance is strong (see Figure 1). Multiple regressions simultaneously accounting

for locomotion and assessment effects (i.e., as separate ‘strength’ scores rather than combined predominance scores) are presented in Table S1 (Appendix C).¹⁹

Figure 1. Locomotion Predominance X Negative Feelings Interaction on the Motivation to Reconcile. One standard deviation above/below the centered values of the predictor variables were entered back into the regression equation to compute these means. Error bars represent ± 1 SEM.



DISCUSSION

Overall, the strength of participants' locomotion predominance is positively predictive of their motivation to reconcile, and negatively predictive of their negative emotions in relation to the conflict. Even more interestingly, the degree of negativity that

¹⁹ These supplementary analyses confirm that locomotion and assessment act as competing forces on an individual when it comes to conflict situations (i.e., their effects go in opposite directions). Though mainly for archival purposes, such analyses provide further justification for the use of the predominance measure rather than locomotion and assessment strength in our primary analyses.

one experiences in relation to the conflict becomes *less* influential as one's locomotion predominance increases. For participants with weaker locomotion predominance scores, more negative feelings are associated with decreased reconciliation motivations. One possible interpretation of this result is that negative feelings can often “get in the way” of peoples' motivation to resolve conflict, but predominant locomotors' motivation for change (as an end in itself) provides a buffer against potential obstructions. This begins to highlight the general premise of Section II and indeed the underlying thesis of this dissertation more broadly: that conflict resolution is not merely instrumentally motivated per se, but in the service of a more fundamental individual motivation for change. Study 1 also begins to highlight this as a story of motivation more than just a story of the negative emotional experience of conflict. For predominant locomotors, the motivation to reconcile is not simply explained by the experience of lower negativity—rather, it is precisely their motivation to overcome high negative feelings that makes them unique.²⁰ The diversity of scenarios with which participants were presented (Appendix B) also goes some way in indicating the stability of these patterns across different conflict and role situations. Having confirmed our intuitions regarding the role of regulatory mode in interpersonal conflict (via chronic individual differences), we then sought to confirm whether similar patterns were true when regulatory mode predominance was experimentally induced.

²⁰ This is an important finding because the nature of the items on the RMQ vary in affective tone. This result captures the relatively more important role of motivation than mere emotional differences between locomotors and assessors. In this way, it complements prior research on RMT across other domains such as decision-making, activity orientations, and achievement (e.g., Kruglanski et al., 2000; Higgins et al., 2003) highlighting motivational rather than purely affective discrepancies.

Study 2

Results of Study 1 provide supporting evidence for the basic relation hypothesized between regulatory mode predominance and conflict resolution. In Study 2, we aimed to provide experimental support for our hypothesis. According to RMT, locomotion and assessment predominance vary across individuals not just chronically (as ‘traits’) but also temporarily (as ‘states’). If the link between conflict resolution and a broader individual motivation for change indeed exists, then it should be present when regulatory mode is treated both as a dispositional *and* as a situational variable. To address this, we used an established experimental manipulation to induce participants into a momentary state of locomotion or assessment predominance, upon which they were exposed to a conflict scenario. In Study 2, we expected that being placed into a state of locomotion predominance would also yield a higher motivation to reconcile, and that this result would be maintained when accounting for the effect of stable individual differences reported in Study 1.

METHOD

Participants

Fifty-eight participants (17 men, 41 women) aged between 18-37 ($M = 23.04$, $SD = 3.88$) were again recruited from Columbia’s BRL for \$5.00 compensation. There were no significant sex differences in any of the variables analyzed below.

Materials and Procedure

Upon entering the lab, participants first completed the RMQ. As in Study 1, locomotion and assessment were uncorrelated— $r(56) = 0.09$, $p = .45$ —and a difference

score ($M = 0.39$, $SD = 0.88$) was calculated as a continuous measure by subtracting participants' assessment scores ($M = 4.05$, $SD = 0.67$, $\alpha = .79$) from their locomotion scores ($M = 4.45$, $SD = 0.64$, $\alpha = .81$).

Participants were randomly assigned to one of two experimental conditions: a locomotion induction ($N = 29$) or an assessment induction ($N = 29$), maintaining similar proportions of men and women. To encourage the belief that the experimental induction had no relation to the subsequent conflict task, participants were asked whether they would be willing to participate in a short pilot study (titled the "Behavior Over Time Task") for a colleague at Columbia Teachers College. If they agreed to participate, they continued to the induction; if they did not consent, they proceeded immediately to the conflict task. Participants in the latter case ($N = 2$) were excluded from analyses.

Devised by Avnet & Higgins (2003), the regulatory mode induction task prompts participants to reflect on three items from the locomotion and assessment (respectively) sub-scales of the RMQ (Kruglanski et al., 2000). Participants read: "This task is about how people recall their behavior over time. You are requested to recall three different behaviors you have used successfully in the past and to write a short example for each behavior. These are the kind of behaviors that you find people doing in everyday life." In the locomotion condition, participants were then asked to: "Think back to the times when you acted like a 'doer,'" "Think back to the times when you finished one project and did not wait long before you started a new one," and "Think back to the times when you decided to do something and you could not wait to get started." In the assessment condition, participants were then asked to: "Think back to the times when you compared yourself with other people," "Think back to the times when you thought about your

positive and negative characteristics,” and “Think back to the times when you critiqued work done by others or yourself.”

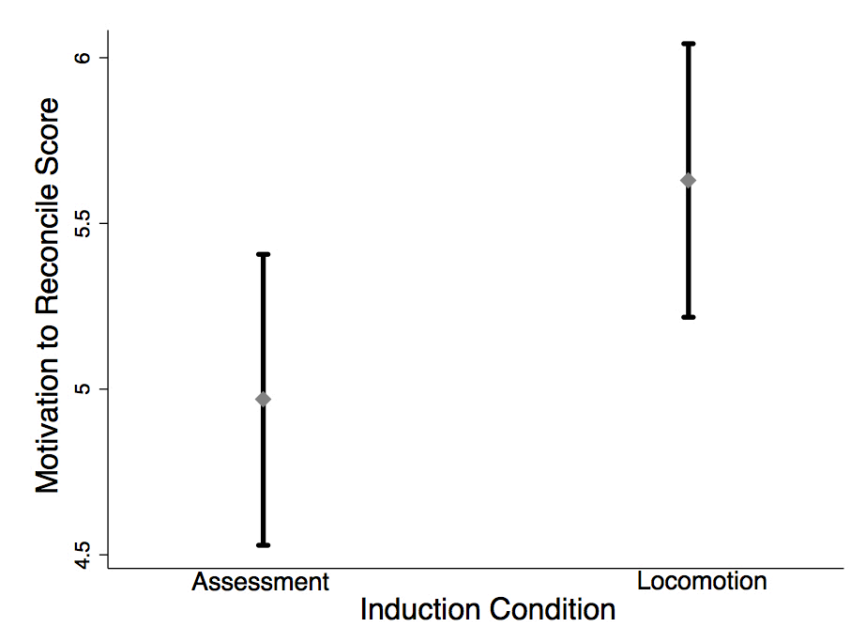
Upon completing the induction instrument, participants then proceeded to the ‘actual’ study. Participants were randomly given one of three of the conflict scenarios described in Study 1 (Appendix B). These three conflict scenarios were selected because they differed neither in the extent to which participants reported a motivation to reconcile, confirmed by the current study ($F(2, 55) = 1.29, p = .29, n_p^2 = .05$) nor in the negative feelings generated, also confirmed in this sample ($F(2, 55) = 1.15, p = .44, n_p^2 = .03$). As in Study 1, ‘role’ was switched in half of the conflicts, but in these particular conflicts, did not significantly impact participants’ reconciliation motivation ($t(56) = -0.74, p = .23$) or negativity ($t(56) = 1.13, p = .13$). Upon reading the conflict, participants were then presented with a conflict resolution questionnaire identical to that used in Study 1.

RESULTS

Results of linear regression analyses indicated a main effect of regulatory mode induction on the motivation to reconcile ($\beta = 0.66, p < .05$), such that those in the locomotion condition reported a higher overall motivation to reconcile than those in the assessment condition (Figure 2). In other words, consistent with our prediction, individuals induced into a state of locomotion predominance were more motivated to resolve conflict than those induced into a state of assessment predominance. In the event that ‘role’ mattered but we just did not have the statistical power to detect it, we performed a multiple regression including both main effects and the interaction term,

which again revealed only a main effect of induction condition ($\beta = 1.06, p = .01$). There was no effect of induction condition on the negative feelings participants reported ($\beta = -0.03, p = .94$), again highlighting that the results on the motivation to reconcile are not merely due to differences in negativity experienced. Importantly, these findings are also reported controlling for chronic individual differences in regulatory mode. Upon adding the chronic predominance X negativity interaction term, the main effect of induction condition was still maintained ($\beta = 0.66, p < .05$).

Figure 2. Motivation to Reconcile by Induction Condition. Point symbols indicate means and capped bars illustrate 95% confidence intervals.



Chronic individual differences in regulatory mode predominance did not predict significant differences in the motivation to reconcile ($\beta = 0.26, p = .15$), or in negative feelings ($\beta = -0.27, p = .14$), though directionally results were consistent with Study 1.

There were also no interactions between regulatory mode predominance and induction condition on reconciliation motives ($\beta = -0.25, p = .41$) or negativity ($\beta = -0.27, p = .46$). Multiple regressions simultaneously including chronic locomotion and assessment strength are displayed in Table S2 (Appendix C).

DISCUSSION

The results of Study 2 extend those of Study 1 by demonstrating that locomotion predominance, when experimentally induced, increases the motivation to resolve interpersonal conflict scenarios. Together, these results suggest that locomotion's predominance over assessment, both as a personality disposition and a situational state, can positively influence peoples' motivation to reconcile. Moreover, results are not merely attributable to the different emotional experience of locomotors and assessors during conflict. In Study 2, despite no effect of mode induction on the negative feelings participants reported, an influence of locomotion predominance on the motivation to reconcile was still observed. In essential yet unique ways, these studies support the underlying hypothesis that an individual motivation to effect change can enable conflict resolution, highlighting this as truly a story of *motivation* rather than purely emotion.

One potential limitation of Studies 1 and 2 is their basis in hypothetical conflict scenarios. Because of this, Study 3 sought to determine whether similar patterns would be found when individuals recalled personal conflict events. Given that participants would be reflecting on their *own* experiences, we also took the opportunity to examine the conflict responses that they enacted following these events.

Study 3

Rusbult and colleagues (1982) have identified two categories of constructive conflict response: *voice* (attempting to improve conditions) and *loyalty* (waiting for conditions to improve), as well as two types of destructive conflict response: *exit* (threatening or ending the relationship) and *neglect* (allowing the relationship to deteriorate). In addition to varying along a constructive/destructive dimension, these responses have been shown to vary in their degree of activity/passivity (Rusbult & Zembrodt, 1983). Exit and voice are considered active behaviors because the individual attempts to *change* something about the conflict situation, whereas neglect and loyalty are considered passive behavioral responses to conflict because no such attempts are made.

In Study 3, participants were recruited to describe a recent conflict episode with a close social partner (a transgression on the part of the partner) and rate their conflict resolution motivations. In addition to reconciliation motivations, we were interested in the relationship between participants' chronic regulatory mode and their conflict responses (exit, neglect, voice, and loyalty). Specifically, we predicted that participants with stronger locomotion predominance would experience conflict as less unresolved than participants with weaker locomotion predominance. We also predicted that given their motivation to make things happen, individuals characterized by stronger locomotion predominance, compared to those characterized by weaker locomotion predominance, would engage in more active and constructive confrontation (i.e., voice responses) than passive and destructive behaviors (i.e., neglect responses). Finally, consistent with the results of Studies 1 and 2, we predicted that locomotion predominance would be related

to a higher motivation to resolve conflict, and lower negative feelings in association with the conflict.

METHOD

Participants

Seventy-seven participants (32 men, 45 women) were recruited from Columbia's BRL for the sum of \$5.00. Ages ranged from 18-45 ($M = 22.90$, $SD = 4.77$), and there were no significant sex differences on variables of interest.

Materials and Procedure

Participants first completed the RMQ. Locomotion and assessment were again uncorrelated— $r(75) = -0.14$, $p = .24$ —and predominance ($M = 0.31$, $SD = 0.97$) was calculated by subtracting participants' assessment scores ($M = 4.05$, $SD = 0.67$, $\alpha = .76$) from their locomotion scores ($M = 4.41$, $SD = 0.68$, $\alpha = .83$).

Participants were then prompted to recall and write about a recent interpersonal conflict experience: "Think of a time recently that you felt out-of-rapport with someone you're close to, to a time when that person did or said something that upset you. Please use the space provided to describe the experience in your own words" (adapted from Kammrath & Dweck, 2006). Upon writing a short conflict essay, participants were given a questionnaire about their post-conflict motivations and behaviors. Items reflected conflict qualities (e.g., "This conflict was significant;" "This conflict feels unresolved") and relationship qualities (e.g., "I am close with my partner;" "I am satisfied with my relationship to my partner"). As in Studies 1 and 2, the first two items on this survey measured participants' current motivation to reconcile and their negative feelings in

response to the conflict. Participants endorsed each item on a Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Participants were also asked to specify how long ago (in days) the conflict took place, in addition to the nature of the relationship (family, friend, romantic, work/school colleague, other). The average recency of the reported conflict was about 3 months ($M = 87.38$, $SD = 114.07$ days), and the most common relation was friendship (63.4%) followed by romantic partner (18.2%) and family member (13.0%).

Next, participants were asked to rate the extent to which they engaged in various conflict behaviors on a Likert-type scale ranging from 1 (*never*) to 5 (*a great deal*). Three items characterized each principal response to conflict (from Kammrath & Dweck, 2006). These included *voice* responses—“I openly discussed the situation with my partner,” “I tried to work with my partner to find a solution to the problem,” and “I tried to bring my concerns out into the open so that the issue could be resolved in the best possible way” ($\alpha = .86$); *loyalty* responses—“I accepted his/her faults and didn’t try to change him/her,” “I tried to accept the situation and move on,” and “I learned to live with it” ($\alpha = .69$); *exit* responses—“I talked about ending the relationship,” “I considered breaking up with my partner,” and “I used threats to pressure my partner into changing his/her thoughts and actions” ($\alpha = .72$); and *neglect* responses—“I sulked about the issue,” “I criticized him/her for things that were unrelated to the real problem,” and “I treated him/her badly, for example, by ignoring him/her or saying cruel things” ($\alpha = .71$).

Before completing the study, participants were given a brief questionnaire about their more general conflict and post-conflict tendencies. We prompted them to think of a social group (5-15 people) of which they were currently a part and had been a part of for

at least one year. They were then asked to respond to the following two (free-response) questions: “How many different conflicts have you had within this group in total?” and “What proportion of the conflicts that you had did you reconcile?”

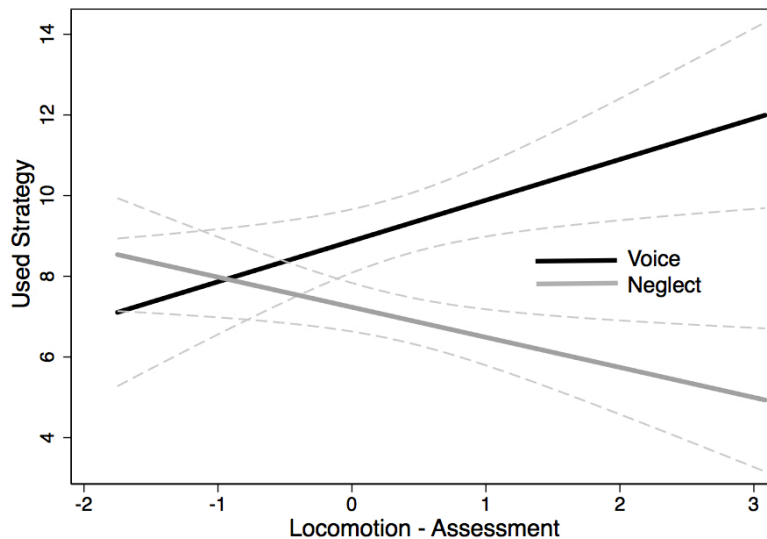
RESULTS

Simple and multiple linear regression models were conducted for all analyses reported below. Regarding the conflict essays participants wrote, the predominance measure did not predict differences in the reported significance of the conflict ($\beta = -0.04$, $p = .83$) or time since occurrence ($\beta = -24.63$, $p = .53$). However, as regulatory mode predominance increased, the likelihood that the conflict felt unresolved decreased ($\beta = -0.62$, $p < .01$), confirming our prediction that locomotion predominant individuals would experience their conflicts as less unresolved than their weaker locomotion predominance counterparts. Even controlling for this factor in a multiple regression analysis, predominant locomotors still reported a higher current motivation to resolve the conflict ($\beta = 0.42$, $p < .05$). Importantly, these patterns are not attributable to differences in characteristics of the conflict (i.e., significance or recency) or relationship (see below) about which participants wrote in their essays.²¹ They are also not attributable to the negative feelings participants reported experiencing due to these conflicts, which again significantly decreased as locomotion predominance increased ($\beta = -0.51$, $p < .01$).

²¹ To be sure this interpretation is accurate, an objective measure of conflict severity was also obtained by having external raters code the written description of the event (on the same scale that participants used). The two coders showed considerable agreement $r(75) = 0.70$, $p < .0001$, so an averaged rating was calculated. This rating had no relation to participants' regulatory mode predominance ($\beta = -0.05$, $p = .77$), helping to rule out the possibility that predominant locomotors simply recall less significant/severe conflicts.

Regulatory mode predominance did not predict significant differences in the nature ($F(4, 70) = .34, p = .85, \eta_p^2 = .02$) or quality (closeness: $\beta = -0.15, p = .92$; satisfaction: $\beta = .24, p = .12$) of the relationship to the conflict partner. It did, however, predict participants' behavioral responses towards their partner following conflict events (Figure 3a).

Figure 3a. Locomotion Predominance and Conflict Strategies. The solid lines are fitted regression lines and the dashed lines denote 95% confidence intervals.



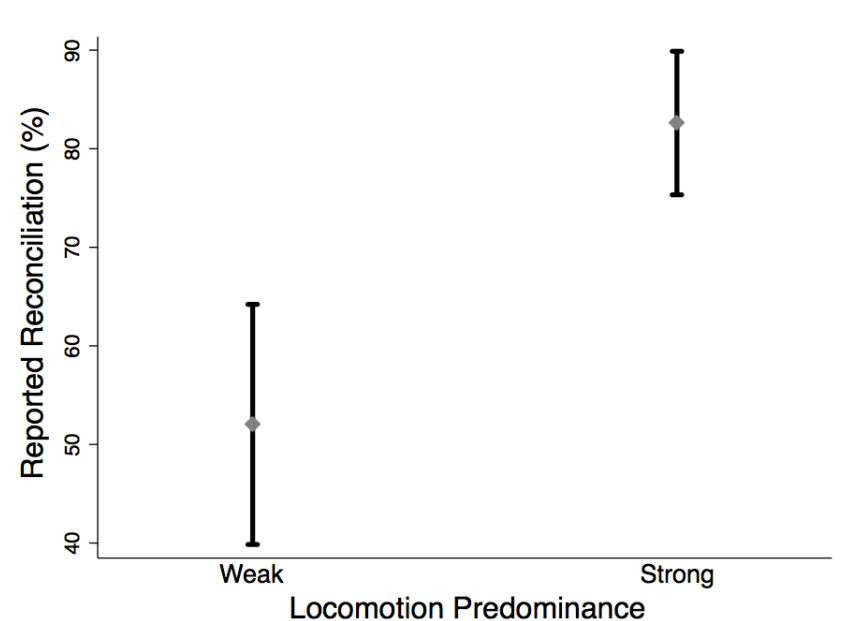
The relation between regulatory mode predominance and *voice* responses was significantly positive ($\beta = 0.94, p = .01$), indicating that stronger locomotion predominance was associated with more use of active, constructive responses to conflict. Conversely, the relation between regulatory mode predominance and *neglect* responses was significantly negative ($\beta = -0.69, p < .05$), revealing that stronger locomotion predominance was associated with less use of passive, destructive responses to conflict.

These effects were maintained when analyses controlled for the extent to which participants felt the conflict was unresolved ($\beta = 0.79, p < .05$ and $\beta = -0.68, p < .05$, respectively). Regulatory mode predominance was not predictive of the use of loyalty ($\beta = 0.22, p = .38$) or exit ($\beta = -0.05, p = .83$) responses to conflict. Despite a significant positive association between locomotion predominance and constructive conflict responses overall ($\beta = 0.56, p < .01$), and a marginal negative relation between locomotion predominance and destructive responses conflict responses overall ($\beta = -0.37, p = .10$), these effects are clearly driven by voice and neglect responses, implicating the activity/passivity dimension in a manner consistent with our predictions.

There was one additional regulatory mode predominance effect in this study worth noting. While regulatory mode predominance did not predict the number of conflicts participants reported experiencing in general ($\beta = -2.34, p = .86$), it *did* predict a significant difference in the proportion of conflicts that they reported reconciling ($\beta = 15.68, p < .0001$).²² As Figure 3b illustrates, individuals characterized by weaker locomotion predominance reported reconciling on average 52.0% of their conflicts, whereas individuals characterized by stronger locomotion predominance reported reconciling on average 82.6% of their conflicts. Taken together, these results provide compelling evidence for our claim that stronger locomotion predominance is associated with a greater individual experience of reconciliation. As in previous studies, multiple regressions revealing patterns for locomotion and assessment strength for outcomes of interest are displayed in Table S3 (Appendix C).

²² Note that these were proportions that *participants* reported, rather than proportions that we calculated from separate counts of reconciliations and conflicts.

Figure 3b. Locomotion Predominance and Reported Percentage Reconciliation. Point symbols indicate means and capped bars illustrate 95% confidence intervals. A median-split on the locomotion-assessment difference score determined weak versus strong locomotion predominance.



DISCUSSION

Study 3 further supports a relation between reconciliation and a broader individual motivation for change, this time in the context of peoples' own conflict experiences. First, as locomotion predominance increased, the likelihood that the conflict felt unresolved decreased. Second, controlling for this factor, predominant locomotion individuals still reported a higher current motivation to resolve the conflict. These results reflect how predominant locomotors do not like disruptive conflict and thus they work to resolve it, which increases the likelihood that they will do so (the first finding) and, to the extent that a conflict has not been resolved, will be more motivated to resolve any remaining conflict (the second finding). Further substantiating this pattern is their reports

of reconciling over 30% more of their conflicts in general, as compared to their weaker locomotion predominance counterparts.

With respect to the particular responses enacted during their conflict experiences, our predictions were met regarding a positive relation between stronger locomotion predominance and the use of voice strategies, and a negative relation between stronger locomotion predominance and the use of neglect strategies. This again reflects the locomotion preference for change over stasis (thus preferring active to passive responses), and the ability to overcome negativity and resolve conflict in the service of change (thus preferring constructive to destructive conflict responses). It adds an important dimension to our understanding, though, in that locomotors are not simply motivated to enact destructive responses that also yield change. Theoretically, one could make a case for locomotion and the use of exit strategies under certain conditions (see Kruglanski, Pierro, & Higgins, *in press*). However, given evidence across these studies that predominant locomotors feel less negatively about the conflict, and that in this study they were prompted to recall a conflict with a current *close* social partner, exiting the relationship would actually create *further* disruption. Unlike the movement and change that characterizes locomotion, the constant appraisal that characterizes assessment can entrench people in the current state of conflict, leading them to not *do* anything about it. Indeed a relation between assessment and rumination, counterfactual thinking, and regret has been established (Pierro et al., 2008). It is precisely this tendency to experience negativity in combination with a susceptibility to stasis over action that could lead to

passive/destructive strategies such as neglect, not found with strong locomotion predominance.²³

Overall, Study 3 elaborates on the role of regulatory mode in individuals' experiences of their own interpersonal conflicts by showing that predominant locomotors' higher motivation to resolve conflicts is compounded with strategies that enable their successful resolution. In our next study, we prompted participants to recall an *ongoing* conflict in their lives. The objective was to test whether the relation between locomotion predominance and conflict resolution would be maintained when people reflect on difficult and persistent interpersonal conflict issues. Studying ongoing (i.e., as opposed to past) conflicts also afforded us the key opportunity to examine how regulatory mode influences the emotional experiences that are present *during* conflict.

Study 4

Having demonstrated that stronger locomotion relative to assessment can positively influence the likelihood and nature of conflict resolution across scenario, experimental, and personalized essay recall studies, we then sought to examine this relation when participants spoke about a conflict that was still very much present in their lives. In Study 4, we asked participants to verbalize and reflect on a persistent, difficult conflict in which they were currently involved. For ongoing, persistent conflicts of this nature, one relevant theoretical approach has been to investigate whether the conflict is

²³ Here it is worth emphasizing that the reason for differences between locomotors and assessors in regret is not simply due to some general difference in negativity, but in their tendency to engage in counterfactual thinking. Similarly, the use of neglect strategies cannot fully be explained by a greater experience of negativity, again underscoring this as a story of motivation. It also suggests some intriguing ways in which these two areas of research might be connected.

‘ripe’ for resolution (e.g., Zartman, 1989; 2000; Coleman, 1997; 2000). Zartman’s theory of *ripeness* (Zartman, 2000) is intended to explain when people in conflict are susceptible to their own or others’ efforts to move the conflict toward resolution. Specifically, when people in conflict have reached a stalemate but perceive the possibility for change, the conflict is ripe (i.e., for steps toward resolution to begin). Ripeness is thus a condition of the *readiness for change*, which has clear and direct relevance to the current thesis and body of work. Specifically, we predict that ripeness will be positively associated with locomotion predominance (as a chronic individual motivation for movement and change). Moreover, given the present nature of the conflicts under study, we examined participants’ affective experience upon privately discussing these issues. Building on results of our previous studies, we predict that stable individual differences in locomotion predominance will be associated with more overall positive affect, and less overall negative affect, when it comes to participants’ ongoing conflict experiences.

METHOD

Participants

Ninety-two participants (29 men, 63 women) were recruited from Columbia’s Teachers College (TC) for \$10.00 compensation. Participants’ ages ranged from 19-46 ($M = 27.40$, $SD = 5.91$). Sex differences with respect to variables of interest are addressed below.

Materials and Procedure

Participants completed an online pre-questionnaire prior to the study, which included the RMQ. In this sample, locomotion and assessment were weakly positively

correlated: $r(90) = 0.24, p < .05$. A continuous regulatory mode predominance measure was calculated ($M = 0.27, SD = 0.92$) by subtracting participants' assessment scores ($M = 4.19, SD = 0.75, \alpha = .81$) from their locomotion scores ($M = 4.47, SD = 0.74, \alpha = .85$) on the RMQ.

On the day of the study, participants came to the TC lab and were prompted to privately verbalize an ongoing conflict in which they were currently involved. Specifically, they were asked to: "Please think of an ongoing difficult conflict that you are currently involved with. It can be a conflict in your family, personal life, at work, in your community or anywhere else. It is important that you are involved in this conflict, that the conflict is ongoing, that the conflict is difficult, and that the conflict feels important to you." After being given two minutes to reflect on the conflict, participants were asked to speak, during a 5-10 minute audio-recorded session, about their current experience and reactions to the conflict. They were specifically asked to: "Please talk about your thoughts and feelings and why this conflict is important to you." Upon completing the audio recording, participants engaged in a short (<15 minute) coding exercise, which was unrelated to the purposes of this study.²⁴

Following coding, participants then completed a questionnaire that measured their post-conflict motivations and feelings. In particular, a set of *ripeness* questions was developed to test for the extent to which the conflict was in a state of readiness for change and resolution. Participants endorsed each of the following items on a Likert-type scale ranging from 1 (*not at all*) to 7 (*extremely*): "It is possible to locate a mutually

²⁴ In brief, all participants were asked to code their conflict narratives for the extent to which they pursued promotion and prevention goals: for more information, see Coleman, Kugler, Kim, & Vallacher (*in prep*).

acceptable agreement/resolution to this conflict,” “I am optimistic about finding an agreement/resolution to this conflict,” “I am motivated to find a solution to this conflict,” “I believe the other disputant(s) are motivated to find another solution to this conflict,” “I can envision a solution to this conflict that could be satisfying for all involved,” “There is a way out of this conflict.” Given high internal consistency ($\alpha = .84$), these six items were averaged to create an overall measure of conflict ‘ripeness’ ($M = 4.41, SD = 1.37$).²⁵ Because men ($M = 4.93, SD = 1.27$) scored significantly higher than women ($M = 4.24, SD = 1.38$) on this measure: $t(90) = 2.23, p = .01$, we controlled for sex in all subsequent analyses.

Participants completed a variety of other surveys designed to capture characteristics of the relationship (e.g., quality and length) and conflict (e.g., context and intensity) about which they spoke, mainly used for control purposes in this study. The most common relation was family (29.4%), followed by work (25.0%) and friend (10.9%). The most common conflict issues concerned relationships (50.0%), values (43.3%), and resources (26.7%)—note that the issues were not mutually exclusive categories. Finally, participants completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS was used to gauge both positive (e.g., active, proud, determined) and negative (e.g., upset, guilty, distressed) emotional responses to the conflict. Specifically, participants used a Likert-type scale ranging from 1 (*not at all*) to 7 (*extremely*) to endorse each of 20 adjectives in response to the question: “How do you feel currently about this conflict?” These were then separately

²⁵ It is worth noting that in his original conceptualization, Zartman (2000) discussed two components of ripeness: a mutually hurting stalemate (MHS) and a mutually enticing opportunity (MEO). Given our primary interest in a perceived solution for (or way out of) conflict, when we refer to ripeness, we are referring mainly to the MEO component.

collapsed into the positive ($M = 3.46$, $SD = 1.22$, $\alpha = .88$) and negative ($M = 4.01$, $SD = 1.31$, $\alpha = .86$) affectivity subscales used in our analyses.

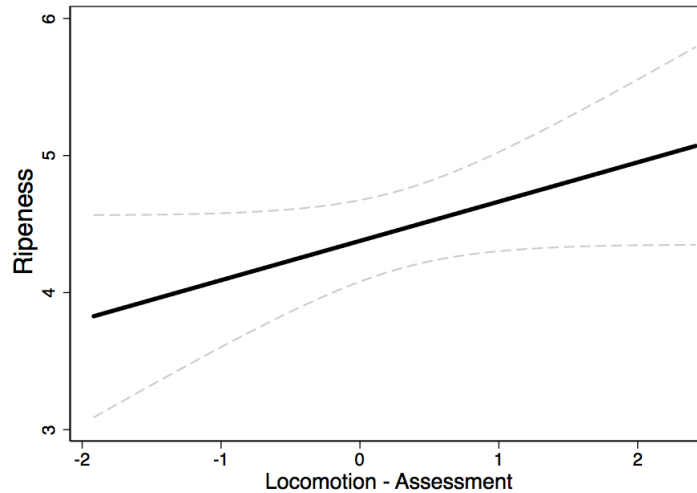
RESULTS

The relation between locomotion predominance and ripeness is displayed in Figure 4a. As in previous studies, we regressed the ripeness measure on the main effect of regulatory mode predominance, controlling for sex. As predicted, there was a significant positive relation between the two variables, such that increases in locomotion predominance strength were associated with increases in ripeness ($\beta = 0.29$, $p < .05$). In other words, as people became more locomotion predominant, they became more likely to report there was a way out of their persistent conflict situation.

Next, we examined the relation between locomotion predominance and the affective experiences participants reported with respect to the conflict. Consistent with our predictions, increases in locomotion predominance were associated with more positive affect in relation to the conflict experience ($\beta = 0.27$, $p < .05$). Further, increases in locomotion predominance were associated with less negative affect in relation to the conflict experience ($\beta = -0.36$, $p < .01$). Together, these results suggest that as people become more locomotion predominant, they attribute more positive emotions and less negative emotions to difficult and ongoing conflict issues in their lives. We conducted follow-up analyses²⁶ that revealed the robustness of these patterns when controlling for qualities of the relationship and conflict about which participants spoke.

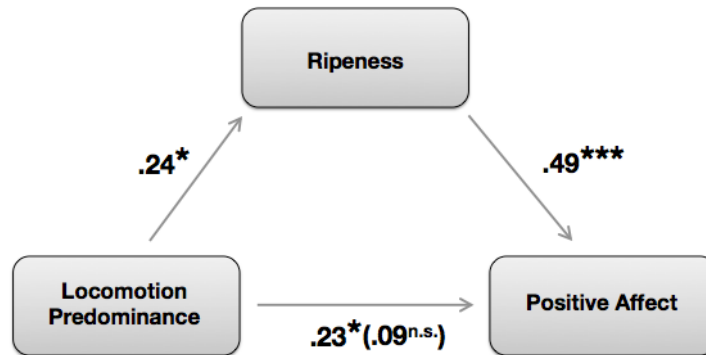
²⁶ As in Study 3, we also obtained an objective measure of conflict severity by having external raters code the verbal transcripts of the event. Two coders showed substantial agreement $r(90) = 0.67$, $p < .0001$, so an averaged rating was used. This rating had no relation to participants' regulatory mode predominance ($\beta = 0.03$, $p = .59$).

Figure 4a. Locomotion Predominance and Ripeness. The dashed line is a fitted regression line and the gray area denotes the 95% confidence interval.



A question raised by the above results, and warranted by this research more generally, is whether the relation between regulatory mode predominance and affect can be explained by ripeness. Accordingly, we ran a mediation analysis, which included sex and negative affect as covariates (notably, unlike positive affect, negative affect was not significantly associated with ripeness). As shown in Figure 4b, the effect of regulatory mode predominance on positive affect was fully mediated by ripeness—predominance, direct: $t(90) = 1.83$; predominance, mediated: $t(90) = 0.80$, Sobel's $Z = 2.05$, $p < .05$.

Figure 4b. Mediation Analysis. The relation between locomotion predominance and a more positive emotional experience regarding conflict is mediated by increased ripeness. Standardized coefficients are shown. * $p < .05$. ** $p < .01$. *** $p < .001$.



Mediation was confirmed by a bootstrapping procedure, an approach advocated by recent researchers that reports confidence intervals (CIs) for the indirect effect in lieu of simple significance tests (Shrout & Bolger, 2002). A boot-strapped (10,000 repetitions) Sobel mediation analysis showed that, controlling for sex and negative affect, ripeness significantly mediated the relation between locomotion predominance and positive affect (bias-corrected bootstrapped indirect effect 95% CI: [.02, .23]). The alternative mediation model (positive affect mediating the relation between locomotion predominance and ripeness) was non-significant (Sobel's $Z = 1.62$, $p = .14$). Results of multiple regressions including both locomotion and assessment strength predictors on outcome measures central to this study are presented in Table S4 (Appendix C).

DISCUSSION

Study 4 adds a new dimension to our understanding of how regulatory mode influences the resolution of interpersonal conflicts. It builds on Study 3's finding that predominant locomotors are more likely to experience their conflicts as resolved, but this time, constrains the task by having participants think of a conflict in which they are

currently engaged. Under such conditions, locomotion predominant individuals are more likely to endorse that their conflicts are ‘ripe’ for resolution. Thus, the locomotion motivation for change and movement facilitates the perception of a way out, no matter how persistent and difficult the conflict. Moreover, predominant locomotors report experiencing more positive affect and less negative affect in relation to those conflicts, corroborating prior study results.

Most importantly, peoples’ sense of ripeness regarding the conflict fully explains the relation between locomotion predominance and positive affect. In other words, a broader individual motivation for change enables a perception of a way out in conflict, which can fully account for the experience of more positive emotions (this makes particular sense when considering specific items from the PANAS such as ‘active’ and ‘determined’). Locomotion gives people the sense that change is possible, indeed even *necessary*, which then yields a more positive affective experience. This pattern further resonates with Study 3 findings regarding individual differences in the particular strategies that are employed following conflicts. Namely, it is likely this sense that the conflict *can* be resolved that leads predominant locomotors to take a more proactive role by engaging in voice strategies. Similarly, one can also imagine that this sense, which contributes to a more positive experience, makes them less likely to engage in neglect strategies. It further helps to elucidate why they would not necessarily be more motivated to seek change through terminating the relationship (exit strategies).

Overall, a ripe moment is one in which “the parties’ motivation to settle the conflict is at its highest” (Zartman, 2000). Though ripeness has been studied across various contexts (see also Zartman, 1989; Coleman, 1997; 2000; Pruitt, 1997; 2007),

limited knowledge has been acquired on stable *individual* motivations that might contribute to its presence (but see Coleman et al., *in prep*). The present study illuminates not just how regulatory mode predominance can create different experiences of conflict ripeness, but also how this experience can in turn contribute to a more positive emotional experience of conflict in particular, which appears to be a benefit of locomotion predominance when it comes to its resolution. Importantly, one could imagine that a motivation for change could have some detrimental consequences in certain cases of conflict resolution, but this study points to one reason (i.e., greater experience of ‘ripeness’ increasing positive affect) why this may not be the case.

Study 5

The four previous studies, using different methods and measures, offer consistent evidence that regulatory mode predominance influences interpersonal conflict resolution. However, a potential limitation to address is the emphasis on individuals’ reports of their conflict experiences rather than behavioral evidence regarding what happens during conflict-related interactions between individuals. Because conflict is inherently an inter-individual phenomenon, self-report data can only go so far in revealing how such interactions actually unfold in the real-world. In Study 5, we recruited roommate dyads to engage in conflict-relevant discussions and sought a behavioral measure to test the hypothesized relation between locomotion predominance and conflict resolution. Namely, we were interested in the *duration* of the discussion between participants as a measure of participants’ motivation to move on, and move on quickly, from the issue. If predominant locomotors are primarily motivated to *get on with it*, we would expect them

to be done with their conflict conversations more quickly. To the extent that predominant assessors are primarily motivated to *get to the bottom of it*, we would expect them to engage in more drawn out discussions about recent conflicts with their roommates. We also predicted that the dynamic most influencing how the discussion unfolds would be dictated by the particular individual whose conflict experience was chosen as the basis of discussion (i.e., the ‘victim,’ detailed in Method below). Specifically, on the basis of the needs-based model of reconciliation (Shnabel & Nadler, 2008), we predicted that the victim’s regulatory mode predominance would dictate conversation length. Shnabel and Nadler’s (2008) research confirms that victims experience a loss of power and control in conflict situations, which they then seek to reassert in post-conflict interactions. This model therefore led to our more specific prediction that conflict *victims* with stronger locomotion predominance would have briefer conflict conversations than their weaker locomotion predominant counterparts. Further, consistent with results of the prior studies reported here, we anticipate that locomotion predominant individuals will indicate that their conflicts are more resolved, and report less negative feelings about them. Thus, Study 5 aimed to replicate and extend previous findings through a real-world situation in which two individuals talked about a recent conflict, affording a key behavioral measure relevant to understanding locomotion and assessment motivations in this context.

METHOD

Participants

50 roommate dyads ($N = 100$) from Columbia’s BRL were recruited to take part in this study. Participants’ ages ranged from 18-37 ($M = 23.31$, $SD = 4.49$). There were

52 female and 48 male participants, constituting 21 female-female dyads, 10 male-female dyads, and 19 male-male dyads (relevant sex differences are addressed separately below). Each roommate was compensated \$5.00 for his or her participation.

Materials and Procedure

Upon entering the lab, dyad members were placed in adjacent rooms to complete the RMQ and conflict description. The conflict prompt was similar to that of Study 3, in that participants were asked to write about a time (in the last year) when they felt out-of-rapport with the roommate who accompanied them to the lab, when the roommate did or said something that upset the participant. To eliminate deception, participants were informed that their roommate would potentially be able to view this description at a later part of the experiment, but that all subsequent questions and questionnaires would remain completely confidential. Following the essay, they responded to several items about the conflict and their relationship to the roommate, rated on Likert-type scales ranging from 1 (*not at all*) to 7 (*very much so*). These included whether the conflict was resolved, how negatively they felt about the experience, how close they feel to their roommate, and how satisfied they are with their relationship. Participants were also asked to indicate how long ago (in days) the conflict began, and how long (in months) they had lived with their roommate. The mean recency of the reported conflict was about 2.5 months ($M = 79.35$, $SD = 91.06$ days). On average, roommates had lived with one another for 8 months ($M = 8.14$, $SD = 7.10$). Upon completion of the essays, the experimenter then randomly selected one of the two roommates' descriptions to serve as the basis for the subsequent discussion. This meant that for half the participants the conflict that was subsequently discussed was an event where *they* felt hurt by their roommate—what we will refer to as

being in the role of ‘victim’ in the conflict. For the other half of the participants, the conflict that was subsequently discussed was an event where they knew their roommate considered themselves to be a victim of something they did or said—placing them in the role of ‘perpetrator’ in the conflict.

Participants were then reunited in a third room and asked to sit at a common table. The experimenter told participants that one of their essays had been randomly selected for the purposes of the study, and that they would be having a discussion about the conflict experience together. The experimenter proceeded to read that description out loud, and then activated a handheld audio recording device on the table moments before leaving the room.²⁷ Participants were instructed to stop the recording when they were finished with their conversation, and then notify the experimenter as such. These recordings provided the basis for our central behavioral measure of interest—conversation length.

In our analyses, we followed the approach recommended by Kenny and colleagues (e.g., Kenny, Kashy, & Cook, 2006) and employed actor-partner interdependence models (APIMs). APIMs account for the mutual influence that dyad members have on one another by estimating the extent to which an individual’s independent variable has an effect on his/her own dependent variable (i.e., an *actor* effect), as well as the extent to which an individual’s independent variable has an effect on his/her partner’s dependent variable (i.e., a *partner* effect). Thus, our models treat the roommate dyad as the major unit of analysis while partitioning the variance for

²⁷ The two female experimenters for this study were instructed to not make eye contact or orient towards either participant while reading these descriptions (randomly selected on the basis of participant numbers); as in previous studies, follow-up analyses revealed no differences in results depending on experimenter identity.

locomotion predominance into effects due to the actor, the partner, and the actor X partner interaction. In this sample, locomotion scores and assessment scores were again slightly positively correlated, $r(98) = 0.22, p < .05$, and as in previous studies, individual predominance scores ($M = 0.42, SD = 0.83$) were calculated by subtracting the latter ($M = 4.02, SD = 0.71, \alpha = .80$) from the former ($M = 4.45, SD = 0.62, \alpha = .81$).

RESULTS

Closeness and satisfaction. Generalized linear mixed models (grouped by dyad) were performed for all APIM analyses (see Campbell & Kashy, 2002). We first ran an APIM using actors' and partners' locomotion predominance scores to predict differences in potential variables that might need to be controlled for in subsequent analyses. While actor/partner locomotion predominance did not predict differences in the recency of the conflict or length of cohabitation between roommates, we did find a marginally significant positive actor effect of locomotion predominance on relationship closeness ($\beta = 0.16, p = .07$) and a significant positive effect on satisfaction ($\beta = 0.19, p < .05$). We found no partner effects or actor X partner interactions on these variables. However, because stronger locomotion predominance was associated with participants reporting that they felt closer and more satisfied in their relationships, we controlled for both factors in subsequent analyses.

Conflict resolution and negativity. We performed another APIM analysis using actors' and partners' locomotion predominance scores to predict actors' perceptions that their conflicts were resolved, and their negative feelings regarding the conflict. Because males ($M = 5.62, SD = 1.24$) reported that their conflicts were more resolved than

females ($M = 4.98$, $SD = 1.88$): $t(98) = 2.03$, $p = .02$, we also controlled for sex in the analyses that follow. Consistent with our hypotheses and the results of prior studies, locomotion predominant individuals were more likely to indicate that their conflict had already been resolved ($\beta = 0.30$, $p < .05$) and reported less negativity in response to the conflict ($\beta = -0.33$, $p < .05$) compared to those individuals characterized by weaker locomotion predominance. There were no partner effects or interactions between roommates' scores on either of these outcomes. Nonetheless, unlike prior studies, we were able to account statistically for the potential interdependence of conflict partners' scores.

Conversation length. Next, we tested the major question of the study: whether roommates' regulatory mode predominance differentially predicted the behavioral outcome measure of conversation length. Because roommates' conversation lengths were (by definition) equivalent, we collapsed by dyad and ran a multiple linear regression controlling for dyad sex-class and combined relationship closeness/satisfaction. Our outcome measure was the length of time (in seconds) of participants' conflict discussion recording, which was log-transformed for normality. Our predictors included locomotion predominance main effects for both the individual whose conflict was chosen, i.e., the 'victim,' and his/her roommate, i.e., the 'perpetrator,' as well as their interaction.

Results of this model revealed a significant main effect of victim predominance ($\beta = -0.39$, $p < .01$), indicating that as victims' locomotion predominance increased, the duration of their conflict discussions *decreased*. However, this association was qualified by a marginal victim X perpetrator locomotion predominance interaction ($\beta = 0.22$, $p = .09$). To facilitate interpretation of these findings, we created four dyad classes

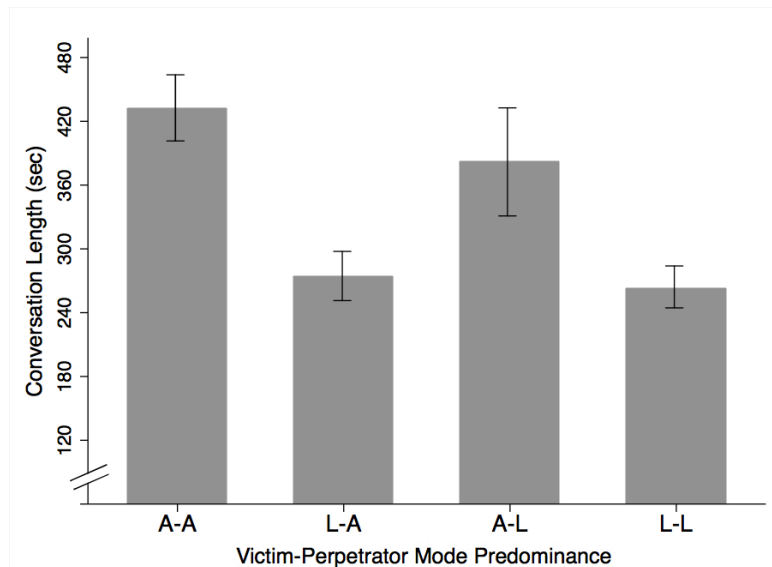
depending on the *victim-perpetrator predominance combination* (see Figure 5). These comprised locomotion-locomotion (LL) dyads, where both victim and perpetrator were locomotion predominant; assessment-assessment (AA) dyads, where both victim and perpetrator were assessment predominant; and two mixed-predominance dyad classes: one where the victim was locomotion predominant and the perpetrator was assessment predominant (LA), and the other where the victim was assessment predominant and the perpetrator was locomotion predominant (AL).²⁸

As illustrated in Figure 5, the length of roommates' conflict discussions varied significantly among these different dyad classes: $F(3, 46) = 4.63, p < .01, n_p^2 = .10$. Planned comparisons revealed a significant contrast between LL/LA dyads versus AA/AL dyads: $F(1, 48) = 7.23, p < .01, n_p^2 = .10$, reflecting the fact that discussions involving locomotion predominant victims' conflicts were overall shorter than discussions involving assessment predominant victims' conflicts. Discussions among AA dyads were significantly longer than those of either LA or LL dyads ($ps < .05$), whereas AA dyads did not significantly differ from AL dyads: $F(1, 48) = 2.99, p = .10, n_p^2 = .06$, although it appears that there is some tendency for locomotion perpetrators to speed up the dyadic conversation. In addition, LL dyads had significantly shorter discussions than did either AL or AA dyads ($ps < .05$), whereas discussion length did not significantly differ between LL and LA dyads: $F(1, 48) = 0.42, p = .52, n_p^2 = .02$. Importantly, these results were maintained when accounting for dyad sex-class, relationship closeness/satisfaction, and the extent to which the conflict was already resolved. Multiple

²⁸ Note that here we refer to locomotion versus assessment predominance, primarily for ease of interpretation. However, a median-split on the locomotion-assessment difference score (i.e., weak versus strong locomotion predominance) yielded similar patterns.

regressions simultaneously accounting for the relative effects of locomotion and assessment strength on primary variables of interest are displayed in Table S5 (Appendix C).

Figure 5. Roommates' Regulatory Mode Predominance and Conversation Length. Means and standard deviations for each dyad class, which denote victim-perpetrator predominance combinations; A = assessment predominant individual, L = locomotion predominant individual.



DISCUSSION

To summarize, upon recruiting roommate dyads to have discussions about recent areas of conflict, we found that participants with stronger locomotion predominance reported their conflicts were more resolved, and less generative of negativity, than did participants with weaker locomotion predominance. In this sense, Study 5 was a replication of Study 3 with extension to a real-world context, allowing us to examine

conflict interactions and simultaneously account for the potential interdependence of dyad members' regulatory mode scores. It also afforded a key behavioral test of our hypothesis that predominant locomotors would be more motivated to move past conflict. Specifically, when conflict discussions between roommates were based on a locomotion predominant victims' conflict, they were over two minutes shorter than conflict discussions surrounding an assessment predominant victims' conflict. Consistent with the needs-based model of reconciliation (Shnabel & Nadler, 2008), victims' regulatory mode predominance was most predictive of the conversation length between participants. The deprivation of power that victims experience in conflict situations leads to a corresponding motivational state in which they experience this deprivation as a need that must be fulfilled. In subsequent interactions, this manifests itself as an enhanced desire to restore their sense of control and an increased likelihood of engaging in power-seeking behaviors (see also Foster & Rusbult, 1999). Importantly, this research builds on Shnabel and Nadler's (2008) framework by suggesting that individual motivations reflecting different regulatory mode concerns can also influence the victim/perpetrator dynamic in ways that are consistent with a needs-based approach.²⁹ It also highlights a unique measure relevant to this dynamic, i.e., how long the conversation between partners over their conflict issue ensues—an important dimension of conflict interactions for research to consider more generally. Our findings suggest that locomotion predominant victims' faster conversation lengths reflect their motivation to simply *get it done*. On the other

²⁹ Interestingly, for perpetrators, the deprivation that is experienced is one of moral inferiority. In post-conflict interactions, this manifests itself as an enhanced motivation to restore a public moral image. Although this remains an open question for future study, perhaps this motivation partially enables the victim's regulatory mode predominance to take precedence.

hand, assessment predominant victims' longer conversation lengths reflect their motivation to *get it right*. Overall, given the locomotion motivation for speed and to move on from conflict situations, and the assessment motivation for accuracy and to figure things out in conflict situations, this behavioral outcome measure yielded results that are consistent with our hypotheses.

In addition to the actor's locomotion predominance predicting that the conflict was resolved, one might expect to find a partner effect—i.e., one's roommate's predominance to also predict as such. Indeed, on its own, partner locomotion predominance *was* a significant predictor of actors' reports that their conflicts had already been resolved ($\beta = 0.32, p = .05$). However, this effect was eliminated upon entering actors' scores into the APIM.

Interestingly, we also found that roommates' locomotion predominance scores were significantly positively related ($\beta = 0.29, p < .05$). In other words, locomotion predominant individuals were more likely to have locomotion predominant roommates, which could reflect a regulatory fit-matching selection effect. This is intriguing in light of our finding that locomotion predominance also predicted more relationship closeness and satisfaction. Whether the higher ability of locomotion predominant individuals to move on from conflict is in part a cause or consequence of having better relationships is a question that warrants future study. This is particularly relevant in a living situation, which may very well provide an additional incentive for partners to put conflict issues in the past. Further, as a test of how discussions unfold when dyads are asked to revisit conflict issues that they have previously encountered, Study 5 was still able to tap into

locomotors' motivation to go forward, and move on quickly, from interpersonal conflict situations—i.e., their motivation to just *get it done*.

CONCLUSIONS

The preceding set of studies represents the first to apply Regulatory Mode Theory (RMT) to human conflict resolution, uncovering the promise of this application when it comes to understanding what motivates different individuals in conflict. It underscores a novel approach to this question by emphasizing that peoples' responses to conflict need not be simply instrumentally motivated (e.g., to restore a valuable relationship), but partially driven by more fundamental individual differences in motivation. Namely, the locomotion desire to effect change echoes what conflict scholars and practitioners have described as an essential driver of conflict resolution. Importantly, change and movement between states is an *end in itself*, suggesting that reconciliation can occur for locomotors regardless of what is instrumentally at stake. On the other hand, the assessment desire to make critical evaluations and comparisons, while also essential to motivation, can have various negative consequences in conflict situations. Specifically, it can cultivate a state of immobility over action and change, which theoretically, will never *in and of itself* resolve conflict. As we have shown here, it is therefore the *predominance* of an individual's locomotion over assessment that is the most relevant predictor of his or her motivation to take that critical step. We have demonstrated this under a range of empirical circumstances, including hypothetical conflict scenarios and experimental

inductions (Studies 1 and 2), as well as personal conflict essays (Study 3), narratives (Study 4), and dynamic roommate interactions (Study 5).³⁰

This is not to say that the assessment mode lacks benefits for conflict resolution. A combination of both locomotion and assessment is necessary for successful goal-pursuit (see Higgins, 2012), and this should be no less true when it comes to resolving conflict. Indeed, previous studies on individual and group performance have shown that assessment and locomotion complement one another and that self-regulation is most effective when both modes are active (see Kruglanski, Orehek, Higgins, Pierro, & Shalev, 2010). One can imagine that assessment would be important to the extent that conflict resolution requires figuring out what went wrong, and evaluating the best or “right” way to proceed (e.g., so as to prevent future conflicts of a similar nature). It is the absence of a stronger motivation to move away from the current state and actually effect change, however, that proves problematic. Further, in many cases there is no *right* solution to conflict but to move forward, again reinforcing the central importance of locomotion’s predominance over assessment. As we have shown here, the *less* locomotion presides over assessment, the *less* motivated people are to reconcile (Studies 1, 2, 3) and perceive a way out of intractable conflicts (Study 4), likely fueled by and fueling *more* negativity (Studies 1, 3, 4, 5), passive and destructive conflict strategies (Study 3), and time taken to deliberate on the issue (Study 5).

In the same vein, there are also costs associated with locomotion in the absence of any assessment. One can easily imagine that merely *getting on with it* may not be

³⁰ Again, supplementary analyses (see Tables S1-5) provide even further support for the notion that locomotion and assessment pull people in *opposite* directions in such conflict situations.

mutually perceived as beneficial or appropriate. In other words, moving forward does not necessarily mean resolving the conflict in the eyes of one's partner. Some conflicts may require extensive deliberation and critical evaluation—but again, as we have shown here, *not* at the expense of taking action toward change. It is therefore of interest for future research to evaluate optimal combinations of locomotion and assessment, both within an individual, but also within a dyad. Though in this research we were most interested in investigating differences between individuals who operate *predominantly* in the locomotion versus assessment mode, follow-up studies should take into account their potential optimality in conflict situations (see Coleman et al., *in prep*).

In highlighting the distinct motivational forces of locomotion and assessment, RMT might also help to illuminate how different ways of self-regulating following interpersonal conflict can exacerbate or even *become* the primary conflict at hand. We have all experienced conflicts where the original goal incompatibility becomes secondary to the conflict that results from the use of incongruent resolution tactics. The image of one person being motivated to move on from the conflict as quickly as possible, and his/her partner being motivated to dig deeper to understand what truly happened, maps well onto our lay theories and perceptions about individual variation in conflict resolution tactics. This common incompatibility can create an entirely new conflict (which intriguingly, has never been the focus of scientific study). This reemphasizes both that responses need not be instrumentally motivated *per se* (i.e., not simply concerning resolutions), and the appropriateness of motivational orientations like locomotion and assessment in understanding such incompatibilities. Indeed, a predominant locomotor for whom change is an end in itself may move on from conflict in the service of just *getting*

it done. The contemplation and evaluation that characterizes predominant assessment does not necessarily yield such change—once again, the process of analysis as an end in itself may stifle this process in the service of *getting it right*. Overall, this highlights something else that we might have yet to appreciate when it comes to conflict resolution: *independent of instrumental concerns, the resolution process itself can also involve a conflict between what two different motivational systems demand*. Building on the previous example, during the resolution process, a high assessment partner who is motivated to find out what *really* happened and respond in the *right* manner can come into conflict with a locomotion partner who is motivated to *move forward* and not look back.

The present research is an important step in understanding how individual differences in basic motivations such as locomotion and assessment influence the conflict resolution process. Because forgiveness, reconciliation, and other conflict resolution constructs are considered to be fundamentally *motivational* phenomena, understanding the self-regulatory processes involved should be a priority. Recent research has begun to apply related motivational frameworks (e.g., Santelli et al., 2009; Coleman et al., *in prep*), and we encourage future work to build on this momentum. Moreover, conflict resolution is not only conceptualized as a motivational phenomenon, but a process and an outcome requiring motivational *change*. We thus also hope that future work will capitalize on the relevant insights RMT in particular can generate for this idea and area of research more broadly. Compared to knowledge regarding the relational factors that influence conflict resolution, individual determinants are much less understood. This is concerning, given that individual dimensions influence how relational processes take

shape. In particular, the ability to manage conflict has clear implications for the development and maintenance of social relationships. Social relationships directly impact human mortality, stress, and myriad other aspects of physical and mental health and well-being (e.g., Cohen, 2004; Helliwell & Putnam, 2004; Holt-Lunstad, Smith, & Layton, 2010), underscoring the broader significance of investigating what motivates different individuals to resolve interpersonal conflicts. As we have demonstrated here, RMT can provide a powerful tool to further this investigation.

GENERAL DISCUSSION

Conflict resolution, in its most fundamental sense, involves a motivational switch between states. While scientists and practitioners across fields have acknowledged this point, both in their definitions and descriptions of conflict resolution constructs, the role of an *individual* motivation for change in resolving conflict has not been the focus of systematic research. As one example, this ‘motivational shift’ is a fundamental assumption made within both the forgiveness and reconciliation literatures (spanning humans and other species), but research to date has failed to translate these assumptions into testable predictions on its occurrence. As an established framework of human motivation, RMT provides an initial step in the realization of this theoretical and empirical translation. RMT posits that movement or change between different states (i.e., locomotion) is a motivation that exhibits considerable variation between individuals. In this body of work, we emphasized individual differences in the motivation to resolve conflict—which had largely been overlooked by prior research—and examined how they might reflect more fundamental individual differences in a motivation for change.

Specifically, we established stable individual differences in chimpanzee reconciliation, and related those differences to locomotion (Section I), and used various approaches to establish a relation between locomotion and conflict resolution in humans (Section II). In the former, we explored how an animal’s conciliatory tendency related to its propensity for social switching behavior. This aspect of locomotion motivation was reflected not only in an individual’s frequency of switching between different social behaviors and partners, but also its speed of switching from conflict to reconciliation. In the latter, we analyzed peoples’ responses to hypothetical conflict scenarios (Studies 1-2),

personal conflict events (Studies 3-4), and real-time interactions (Study 5), and measured locomotion as a personality disposition (Studies 1,3-5) and an experimentally induced state (Study 2), reinforcing this relation across a range of methodological contexts.

Together, the results obtained support our hypotheses and highlight the generality of the proposed link between a motivation for change and conflict resolution, providing empirical support for a relation that was conceptually implicit.

This work simultaneously addresses the lack of research on individual differences in post-conflict behavior, a gap that is almost as deep in humans as it is in other species. In nonhuman primates, variation in reconciliation has typically been accounted for by species, group, and dyadic patterns, rather than stable individual predictors. In humans, even forgiveness theory has tended to neglect the role of dispositional factors, again emphasizing how partners' relationships and conflict attributes influence the tendency to forgive. Research presented in both Sections I and II demonstrated that *individual* motivations for resolving conflict can explain variance beyond that accounted for by important relational (e.g., the quality of the relationship between opponents) and situational (e.g., conflict context or intensity) characteristics. Further, these individual motivations need not be instrumentally driven (i.e., in the direct service of resolutions), but in the service of a broader motivation to change (and change quickly) between different states. Thus, incorporating individual dimensions into research on conflict and post-conflict motivations in both humans and nonhuman animals could not only help unravel inconsistencies in existing research findings, but yield many new interesting research avenues of their own.

In nonhuman animals, honing the study of post-conflict behavior to the individual level of analysis introduces myriad questions. Given our findings relating individual differences in reconciliation to locomotion, another factor from the animal personality research worth highlighting is activity (Freeman & Gosling, 2010), which generally refers to the amount of physical movement an individual engages in. While our study focused on one aspect of social activity (i.e., social switching behavior), it would be of interest to explore whether animals who are more active in general engage in different frequencies and types of conflict and post-conflict behaviors (not to mention other social behaviors). This highlights the promise of frameworks like RMT in generating novel predictions about animal behavior, an overarching objective of this work.

An additional question these results provoke is how reconciliation fits under other broader personality structures also being studied in animals—for example, bold/shy, sociability, and measures of the Big Five like extraversion and agreeableness. Indeed, ‘friendlier’ or more outgoing animals may have higher conciliatory tendencies than those lower in such traits, a question beyond our limits that nevertheless merits attention. Although an animal’s propensity for social change, and fast initiation of change, is different from social motivation per se, future research must parse these motives and develop validated behavioral measures of locomotion. This will lend itself to unique study questions, such as the extent to which locomotion motivation might predict (and potentially underlie) other aspects of animal sociality and behavior. Finally, questions about individual variation in the behavioral repertoires for reconciliation (For example, do some animals exhibit different behavioral profiles for reconciling? Are some more

likely to adopt certain behaviors only in post-conflict contexts?) set another important agenda for future research.

In the same chimpanzee groups studied in Section I, Romero and colleagues (2010; 2011) have also investigated consolation and appeasement behaviors. In some primates, post-conflict affiliative interactions not only take place between conflict opponents, but can be directed from bystanders towards conflict victims (in the case of consolation) and aggressors (in the case of appeasement). Like reconciliation, these behaviors are important in mitigating conflicts-of-interest, and thus play an important role in limiting the costs and preserving the benefits of social group life. It is not only of interest to explore consistent individual variation in different post-conflict behaviors (Webb, Romero, Franks, & de Waal, *in prep*), but potential intercorrelations among them—e.g., do individuals with higher reconciliation tendencies also console more? How might other (i.e., higher-level) personality dimensions be predictive of such correlations? Though conflict itself is not a well-documented phenomenon within the nonhuman primate personality literature, some research (e.g., Pederson et al., 2005) has revealed that different personality dimensions are positively (e.g., dominance) and negatively (e.g., agreeability) predictive of agonistic behavior in chimpanzees. Perhaps because extensive study periods are often required to amass sufficient observations, an effective integration of conflict (and in effect, post-conflict) processes within animal personality research, while promising, has thus far proven difficult. Nonetheless, we encourage future studies in this area to consider how reconciliation and various other aspects of individual post-conflict repertoires can inform (and be informed by) the relevant animal personality research.

We also encourage animal personality research to apply novel motivational frameworks like RMT. While more than a decade of research has established RMT as a useful model of human behavior and personality, this is the first attempt to highlight its utility for generating predictions in animals. In effect, the question remains as to whether and how it would also be possible to measure assessment motivation in other species, making this an additional priority for future work. Following the basic premise that locomotors are motivated to initiate and maintain movement while assessors are motivated to appraise the situation and choose among alternatives, there are conceivable observational and experimental techniques that would tap into these motivational orientations. Though beyond the scope of the present work, such techniques could provide original, much-needed theoretical approaches to the study of animal personality and—to anticipate a later argument—individual welfare and fitness (see Franks, Higgins, & Champagne, 2014).

In this dissertation, RMT served as a theoretical starting point for investigating how reconciliation may relate to an underlying motivation to switch between different social states, allowing us to study reconciliation as motivational change and generating useful predictions for stable individual differences in behavior not only in humans, but in other primates. The question of whether nonhuman primates can help us understand human behavior has long interested ethologists and psychologists alike (Hinde, 1987). Interdisciplinary approaches have numerous advantages, some of which are captured by this body of work. Following Brosnan, Newton-Fisher, and van Vugt (2009)'s typology, they can stimulate new research ideas and methods—in our research, they highlighted a gap in knowledge when it came to individual differences in reconciliation, not just in

nonhuman primates but additionally within our own species. Cross-disciplinary perspectives also help elucidate unexpected or inconsistent data (e.g., inconclusive support for the VRH in children), which we hope this individual-level approach will facilitate in the future. They can also contribute to the advancement of theory. In our research, we add post-conflict motivations to the growing body of topics to which RMT has been applied, and begin to suggest ways in which locomotion might be operationalized in nonhuman animals. With necessary caution, applying human personality frameworks to other species can not only aid in theory development, but help researchers avoid ‘reinventing the wheel’ across disciplines (Brosnan et al., 2009). Finally, interdisciplinary approaches can also illuminate the evolutionary underpinnings of particular social psychological phenomena. Although reconciliation has been studied widely in our close primate relatives, and used to understand the origins of our own behaviors, exploring how individual differences and underlying motives influence its occurrence will only broaden this understanding.

In humans, another interdisciplinary question raised by this research is the distinction between reconciliation and forgiveness. Although these concepts are clearly related, and often used synonymously, there are important differences. In particular, reconciliation involves a behavioral or psychological act toward resuming friendly relations with a social partner, which is clearly distinct from the act of forgiveness, i.e., pardoning a partner’s transgression. These have remarkably different implications for an individual’s social relationships, a topic which has yet to be formally addressed by research. For example, in what cases might an individual be motivated to reconcile, but not forgive; and vice versa? Throughout Section II, we intentionally asked participants

about their motivation to reconcile rather than forgive, realizing that variation in the meaning participants extracted from this was inevitable (Hook et al., 2012). Nonetheless, we believe the discrepancy is an important one for future research to more explicitly acknowledge and address. Regardless of their differences, what reconciliation and forgiveness maintain in common is a basic motivational switch, prompting a prosocial change on behalf of one or both opponents. This switch is something that we share with other primates, allowing us to overcome the potentially disruptive conflicts incited by the intensely social lives that we lead.

Returning to the role of locomotion in conflict resolution in humans, it is also worth noting that movement saturates the *language* used to describe conflict resolution—you *move on* or *past*, you *get over* or *beyond* (consider also what it means to *meet halfway*). Alternatively you *don't get anywhere*, you *make no progress* or have otherwise *reached an impasse* or a *stalemate* (consider also what it means to *stand one's ground*). Cognitive linguists have long been interested in the impact of metaphors on our everyday construal of events and relationships (see Landau, Meier, & Keefer, 2010). Given the central role these metaphors can play in our social cognition, and strong links between locomotion and conflict resolution in this regard, it is perhaps surprising that the study of movement has not permeated the field more generally (but see: LeBaron, MacLeod, & Acland, 2014).

In this vein, Section II points to cases where a locomotion state can be advantageous for reconciliation, not only as a chronic 'personality' disposition, but a situationally induced experience. The latter raises the question of whether physical movements like walking (as a behaviorally induced locomotion state) could similarly

facilitate reconciliation. On this topic, recent research has demonstrated the positive effects of walking on cognitive processes such as creativity (Oppezzo & Schwartz, 2014), and a much larger body of work has documented the benefits of physical activity to cognitive functioning in general (see Hillman, Erickson, & Kramer, 2008 for a review). Although these studies emphasize individual advantages, the functions are highly relevant to interpersonal conflict resolution (e.g., cognitive flexibility and cognitive control). However, the extent to which walking could influence inter-individual processes like conflict resolution is a question that has received little if any scientific attention. It is certainly conceivable that locomotion in a behavioral form such as walking might also facilitate reconciliation through a variety of cognitive and motivational pathways. Insofar as physical movement effectively induces people into a state of locomotion, RMT provides added theoretical structure and insights regarding potential mechanisms. Beyond its individual effects, as a dynamic process between individuals, walking while discussing conflicts could increase the kind of cognitive complexity useful for perspective-taking and joint problem-solving, of clear importance to resolutions. In other words, beyond its known within-individual influences, walking could open the door for more integrative ideas and solutions *between* individuals, augmented by locomotion, behavioral synchrony, and various other physical and psychological factors (see Webb, Rossignac-Milon, & Higgins, *in prep*).

That locomotion could inspire behavioral interventions for conflict resolution underscores the promise of applying motivational frameworks like RMT. Scientists have long been interested in the motivational factors that influence an individual to engage in conflict resolution. How people chronically and situationally respond to conflict has

profound implications for their relationships. Not surprisingly, studies suggest that people who respond well in the face of conflict have longer and more satisfying relationships than do those who respond poorly. Indeed, high locomotors report that they have more friends and higher relationship satisfaction; whether this is partially a cause or a consequence of their higher tendencies to resolve conflict remains to be investigated. Across humans and other primates, the strength and stability of an individual's social relationships have remarkable consequences for welfare and longevity (see House, Landis, & Umberson, 1988; Silk, 2007). Yet at least in nonhuman primates, studies on individual differences in social behavior have typically focused on 'sociopositive' (e.g., grooming, playing, tolerating and seeking proximity to others) rather than post-conflict behaviors. While reconciliation may very well be labeled 'sociopositive,' its essential nature is actually a tendency to overcome *negative* (i.e., costly) social interactions. In other words, beyond maximizing the benefits of one's social relationships, reconciliation reflects an individual's ability to mitigate or repair their associated costs. It thus can contribute novel and valuable insights to the study of individual variation in sociality and more ultimately, individual fitness.

The importance of social behavior to evolutionary processes can ironically overshadow these individual dimensions, the level on which selection actually acts (i.e., it is the behavior of individuals, not of dyads, that is subject to natural selection). The interdisciplinary approach pioneered by this research reveals that in humans and chimpanzees, a common motivation for change underlies individual differences in the tendency to reconcile conflicts with relationship partners. The complexity and importance

of social relationships across the primate order suggest the profound implications these differences can have—not just on the quantity but the *quality* of individuals' lives.

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APPENDIX A: Regulatory Mode Questionnaire (Kruglanski et al., 2000)

Read each of the following statements and decide how much you agree with each according to your beliefs and experiences. Please respond according to the following scale:

1 = strongly disagree 4 = slightly agree
2 = moderately disagree 5 = moderately agree
3 = slightly disagree 6 = strongly agree

- _____ 1. I don't mind doing things even if they involve extra effort.
- _____ 2. I never evaluate my social interactions with others after they occur.
- _____ 3. I am a "workaholic."
- _____ 4. I feel excited just before I am about to reach a goal.
- _____ 5. I enjoy actively doing things, more than just watching and observing.
- _____ 6. I spend a great deal of time taking inventory of my positive and negative characteristics.
- _____ 7. I like evaluating other people's plans.
- _____ 8. I am a "doer."
- _____ 9. I often compare myself with other people.
- _____ 10. I don't spend much time thinking about ways others could improve themselves.
- _____ 11. I often critique work done by myself and others.
- _____ 12. I believe one should never engage in leisure activities.
- _____ 13. When I finish one project, I often wait awhile before getting started on a new one.
- _____ 14. I have never been late for work or for an appointment.
- _____ 15. I often feel that I am being evaluated by others.
- _____ 16. When I decide to do something, I can't wait to get started.
- _____ 17. I always make the right decision.
- _____ 18. I never find faults with someone I like.
- _____ 19. I am a critical person.
- _____ 20. I am very self-critical and self-conscious about what I am saying.
- _____ 21. By the time I accomplish a task, I already have the next one in mind.
- _____ 22. I often think that other people's choices and decisions are wrong.

- _____ 23. I have never hurt another person's feelings.
- _____ 24. I am a "low energy" person.
- _____ 25. Most of the time my thoughts are occupied with the task that I wish to accomplish.
- _____ 26. I feel that there is no such thing as an honest mistake.
- _____ 27. I rarely analyze the conversations I have had with others after they occur.
- _____ 28. When I get started on something, I usually persevere until I finish.
- _____ 29. I am a "go-getter."
- _____ 30. When I meet a new person I usually evaluate how well he or she is doing on various dimensions (e.g., looks, achievements, social status, clothes).

APPENDIX B: Conflict Scenarios used in Studies 1 & 2 (Section II)

Note

Scenarios 1-6 were used in Study 1

Scenarios 1-3 were used in Study 2

Scenario 1: Shown in both 'role' versions

Imagine that you and a friend are having a conflict over differing ideas of how to spend more time together. You have both recently desired 'expanding your horizons' by meeting new people, and think it would be fun and beneficial to your friendship to have these new experiences together. However, it is beginning to feel like you are seeking to widen your social circle in different ways (for example, you are excited about going to museums and art galleries; your friend is excited about going to parties and social events). As a result, your friend is becoming involved in a somewhat different 'scene,' and although makes an effort to include you, realizes that you are not as eager. You make the effort to be inclusive of your friend as well, but feel that he/she is not as enthusiastic. It feels like your mutual goal of wanting to experience new things together and advance your friendship is being thwarted by different ideas on what those experiences should be.

Imagine that you and a friend are having a conflict over differing ideas of how to spend more time together. You have both recently desired 'expanding your horizons' by meeting new people, and think it would be fun and beneficial to your friendship to have these new experiences together. However, it is beginning to feel like you are seeking to widen your social circle in different ways (for example, your friend is excited about going to museums and art galleries; you are excited about going to parties and social events). As a result, you are becoming involved in a somewhat different 'scene,' and although make an effort to include your friend, realize that he/she is not as eager. Your friend makes the effort to be inclusive of you as well, but feels that you are not as enthusiastic. It feels like your mutual goal of wanting to experience new things together and advance your friendship is being thwarted by different ideas on what those experiences should be.

Scenario 2:

Imagine that you and a friend are having a conflict over finding a new summer job. You both work in the same field and are each having a difficult time getting ahead in a competitive market. You research some prospective employers and find something you are especially interested in, at which point you mention it to your friend. Your friend ends up applying for the position and tells you that he/she is doing so. Although your friend does not want to hurt your feelings, he/she believes that this is too good of an opportunity to pass up. He/she knows that there will be many applications for this position, and believes that one more application will not hurt your chances significantly. However, you spent the time researching prospective jobs and feel that you and his/her similar qualifications will lessen your chances.

Scenario 3:

Imagine that you and a friend are having a conflict over your friend not making enough time for you and generally not keeping in enough touch. You understand that your friend has a lot of other obligations, but also worry that he/she is being neglectful, and that as a result your friendship isn't as strong as it once was. Your friend feels that you are being unfairly critical, and wishes that you could be more understanding and not let it influence your friendship so much. You think it's your duty as a friend to let him/her know how you are feeling, but your friend feels you should understand that he/she is not neglecting you on purpose, just has a lot on his/her plate right now.

Scenario 4:

Imagine that you and a friend are engaged in a conflict over your friend not giving you support when you expected it. You are having a small gathering at your place to celebrate your birthday, and your friend calls you last minute to inform you that he/she cannot make it because of another commitment. You really hoped that your friend would be in attendance, and that you'd have a fun time together. You are disheartened that he/she chose to do something else. Your friend also feels bad for not coming, but insists on making it up to you at a more ideal time.

Scenario 5:

Imagine that you and a friend are engaged in a conflict over your friend failing to keep a secret of yours. You confided in your friend about some troubling family matters at home, and asked that it remain between the two of you. However, you recently found out that your friend told a mutual close friend of yours what was going on. This mutual friend had been asking how you were doing lately. You felt that your confidant friend had a responsibility to keep that secret to him/herself, but that friend believed he/she ought to share such a serious matter with your other friend because he/she was concerned.

Scenario 6:

Imagine that you and your friend are having a conflict about who should live in the smaller and more substandard bedroom in a new apartment. Your friend feels that he/she deserves the better of the two bedrooms because in your former apartment (that you also shared), he/she had the 'worse' room. You feel that the current difference is much more pronounced and it cannot be settled simply in that way. Not only would you have to sell furniture in order to accommodate the smaller bedroom, this room is closer to the street and can be rather noisy, making it difficult to sleep at night. You express concern about having a lot of important work to do in the coming months and not wanting your performance to drop. Although you both recognize and understand the others' point of view, you are unable to reach a solution with which you are both satisfied. In the end, you decide you should take the worse room to avoid any more unpleasant discussion, but things still don't feel quite right.

APPENDIX C: Supplementary Tables for Studies 1-5 (Section II)

Table S1. Study 1 Multiple Regressions with Regulatory Mode Strength

<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Z</i>	<i>P</i>
Reconciliation					
Locomotion	0.201	0.087	0.030 — 0.372	2.30	0.021
Assessment	-0.169	0.087	-0.340 — 0.002	-1.94	0.053
Negativity					
Locomotion	-0.225	0.103	-0.428 — -0.023	-2.18	0.029
Assessment	0.280	0.103	0.077 — 0.483	2.71	0.007

Note. *N* = 89. For each outcome variable (in bold), locomotion and assessment were entered in the model simultaneously to determine their relative effects.

Table S2. Study 2 Multiple Regressions with Regulatory Mode Strength

<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Z</i>	<i>P</i>
Reconciliation					
Locomotion	0.209	0.154	0.100 — 0.518	1.36	0.181
Assessment	-0.149	0.154	-0.459 — 0.160	-0.97	0.338
Negativity					
Locomotion	-0.130	0.184	-0.500 — -0.240	-0.70	0.484
Assessment	0.272	0.184	-0.097 — 0.642	1.45	0.145

Note. $N = 58$. For each outcome variable (in bold), locomotion and assessment were entered in the model simultaneously to determine their relative effects.

Table S3. Study 3 Multiple Regressions with Regulatory Mode Strength

<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Z</i>	<i>P</i>
Reconciliation					
Locomotion	0.581	0.155	0.271 — 0.890	3.74	0.000
Assessment	-0.051	0.159	-0.365 — 0.268	-0.32	0.750
Negativity					
Locomotion	-0.259	0.186	-0.629 — 0.112	-1.39	0.168
Assessment	0.430	0.190	0.051 — 0.809	2.26	0.027
Unresolved					
Locomotion	-0.339	0.222	-0.832 — 0.055	-1.75	0.085
Assessment	0.427	0.228	-0.026 — 0.881	1.88	0.065
Voice					
Locomotion	0.804	0.373	0.064 — 1.544	2.16	0.034
Assessment	-0.489	0.379	-1.243 — 0.263	-1.29	0.200
Loyalty					
Locomotion	-0.145	0.244	-0.630 — 0.340	-0.59	0.553
Assessment	-0.467	0.248	-0.959 — 0.026	-1.88	0.063
Exit					
Locomotion	-0.285	0.239	-0.761 — 0.190	-1.19	0.236
Assessment	-0.229	0.243	-0.712 — 0.254	-0.94	0.348
Neglect					
Locomotion	-0.468	0.288	-1.040 — 0.103	-1.63	0.107
Assessment	0.494	0.292	-0.086 — 1.074	1.69	0.094

Note. $N = 77$. For each outcome variable (in bold), locomotion and assessment were entered in the model simultaneously to determine their relative effects.

Table S4. Study 4 Multiple Regressions with Regulatory Mode Strength

<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Z</i>	<i>P</i>
Ripeness					
Locomotion	0.144	0.146	-0.146 — 0.434	0.99	0.326
Assessment	-0.028	0.146	-0.568 — 0.016	-1.88	0.063
Positive Affect					
Locomotion	0.303	0.134	0.036 — 0.570	2.25	0.027
Assessment	-0.134	0.133	-0.398 — 0.130	-1.01	0.317
Negative Affect					
Locomotion	-0.184	0.137	-0.457 — 0.088	-1.34	0.184
Assessment	0.324	0.138	0.049 — 0.598	2.35	0.021

Note. $N = 92$. For each outcome variable (in bold), locomotion and assessment were entered in the model simultaneously to determine their relative effects.

Table S5. Study 5 Multiple Regressions with Regulatory Mode Strength

<i>Variable</i>	β	<i>SE</i>	<i>CI</i> ₉₅	<i>Z</i>	<i>P</i>
Resolved					
Locomotion	0.386	0.267	-0.137 — 0.909	1.45	0.148
Assessment	-0.194	0.232	-0.649 — 0.260	-0.84	0.402
Negativity					
Locomotion	-0.408	0.261	-0.919 — 0.103	-1.56	0.118
Assessment	0.165	0.224	-0.274 — 0.604	0.74	0.461
Conversation Length					
V Locomotion	-0.209	0.094	-0.400 — -0.020	-2.24	0.032
V Assessment	0.126	0.098	-0.073 — 0.324	1.29	0.207
P Locomotion	0.022	0.087	-0.156 — 0.198	0.25	0.805
P Assessment	0.147	0.100	-0.058 — 0.351	1.46	0.155

Note. $N = 100$. For each outcome variable (in bold), locomotion and assessment were entered in the model simultaneously to determine their relative effects. V refers to conflict 'victim,' P refers to conflict 'perpetrator.' It should also be noted that the first two variables were calculated for all participants (i.e., victims and perpetrators) because they were measured before conflict selection.