

ABSTRACT

Title of dissertation: A SESSION LEVEL ANALYSIS OF THE RELATIONSHIP BETWEEN A GROUP MEMBER'S FIT WITH HER GROUP AND PTSD SYMPTOM CHANGE IN A SAMPLE OF INCARCERATED WOMEN SEEKING TRAUMA TREATMENT

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The present study sought to apply the concept of person-group fit from the domain of organizational psychology to the domain of group psychotherapy. Specifically, using a time-series series design, the current study examined the relationship between an individual group member's fit with her group on two dimensions, perceptions of group climate and in-session intimate behaviors, and whether fit and standing on these dimensions were related to change in PTSD symptoms. An archival data set of 73 incarcerated women participating in six manualized (Trauma Recovery Empowerment Model [TREM], Harris, 1998) therapy groups for the treatment of co-morbid trauma and substance use disorders were analyzed. The relationship between the level of fit on these dimensions and change in PTSD symptoms as documented by participants' pre- and post-test scores on the PTSD Symptom Scale–Self Report (PSS-SR) was assessed. Using a session-level analysis ($N = 1,606$) and the Actor-Partner Interdependence Model (APIM) (Kenny, Kashy, Manetti, Piero, & Livi, 2002) both individual (Actor) and group (Partner) effects were modeled in order to test hypotheses about the individual, the group, and the

fit between actor and partner and PTSD symptom change. Twenty-two of 73 women did not complete treatment. Analyses revealed significant partner effects for group members who completed both pre and posttest PTSD measures ($n = 51$) and those who did not ($n=22$). Specifically, members who completed both measures were in groups in which the other members perceived higher levels of engagement and lower levels of conflict. Results indicated that for both the individual and the other group members (partners), perceptions of the level of group engagement increased over time, perceptions of group conflict and avoidance decreased over time, and the average level of intimate behaviors in which group members engaged did not significantly change over time. PTSD symptoms decreased significantly between pre and posttest, however, no significant relationship was observed between fit of a group member and her group and PTSD symptom change. Results, limitations, and alternatives for data conceptualization and future analysis are discussed.

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Chapter 1: Introduction

Tania is a member of a trauma treatment group that meets on Mondays and Wednesdays. Tania's group leader notices that she is a very active and engaged group member and is in a group in which the other members are also very active and engaged. Liz is in a different trauma treatment group that meets on Tuesdays and Thursdays. Like Tania, Liz is similarly active and engaged during her group's sessions. However, the group leader notices that Liz appears more engaged and active during group sessions than the other members of this group. What might the group leader conclude about what is happening in the groups for Tania and Liz? What about for the other members of these groups? What might she or he conclude about Tania and Liz's "fit" with her respective group? And how might the construct of "fit" bear on how effective treatment will be for each woman?

The concept of fit, or congruence, has been examined extensively in the domains of industrial/organizational (I/O) and vocational psychology (Spokane, Meir, & Catalano, 2000). Fit models such as person-environment (P-E) fit are the dominant research paradigm in I/O and vocational psychology (Hoffman & Woehr, 2006; Spokane et al., 2000; Verquer, Beehr, & Wagner, 2003). Simply put, these models aim to understand how certain characteristics, traits, or behaviors of individuals match with that of their work environments, and how this match (which may be high or low) may be related to a host of important outcome variables (Hoffman & Woehr, 2006; Spokane et al., 2000; Verquer et al., 2003). Person-group (P-G) fit may be an even more parsimonious way of looking at P-E fit in this context. P-G fit models have examined the extent to which congruence between an individual worker and his or

her immediate work group (i.e., the group of people this person works with most closely) may affect important individual and group-level outcomes (Adkins et al., 1996; Judge & Ferris, 1992; Kristof-Brown & Stevens, 2001; Kristof-Brown et al., 2005; Werbel & Gilliland, 1999).

Similar to congruence is the concept of convergence. Mathematically, convergence refers to the place at which two lines eventually meet in time. For example, over the course of treatment, the therapist and client might converge in their worldviews (Gelso & Carter, 1985). While convergence has been studied in the literature on dyadic therapy (Al-Darmaki & Kivlighan, 1993; Borghi, 1968; Gulas, 1974; Kivlighan & Gayle, 2000; Pepinsky & Karst, 1964; Sandler, 1975) this concept has rarely been studied in the context of group psychotherapy. In contrast to convergence in dyads, congruence is a more apt term for the “multiple convergences” that potentially occur in a group context. Furthermore, while convergence implies a “coming together over time,” congruence may be assessed at any point. For example, an individual group member may be high on congruence with the other members of her group in terms of the way she perceives the group’s climate, and this congruence could be assessed at any one point in time.

Only two known studies have examined a concept approximating congruence in the group psychotherapy literature (Flowers, 1987; Paquin, Miles, & Kivlighan, 2011). The former (Flowers, 1987) found that group members who did not improve after treatment ranked the importance of the therapeutic factors differently from the other members of their groups. There were, however, several flaws in the study’s design and the findings should therefore be interpreted with caution. The latter

(Paquin, et al., 2011) built on Yalom's conception of being an outlier in group therapy (Yalom, 2005). Specifically, Yalom cautioned group therapists to be watchful for group members who participated less than or more than the other members of their groups as these members were at risk for early dropout (Yalom, 2005). Paquin et al. (2011) found that among interpersonal growth group participants, being an outlier, or incongruent, in terms of how much intimate behavior a group member engaged in compared with his or her group predicted absence from the group the following session.

In sum, the role of congruence, while important in other domains such as organizational and vocational psychology, is an understudied yet potentially promising variable in the domain of group psychotherapy. Furthermore, convergence on a variety of variables between therapist and client appears to be an important construct in dyadic therapy (Al-Darmaki & Kivlighan, 1993; Borghi, 1968; Gulas, 1974; Kivlighan & Gayle, 2000; Pepinsky & Karst, 1964; Sandler, 1975). Therefore, the present study seeks to examine whether congruence between a group member and her group has any bearing on group member outcomes in therapy. However, congruence is only a meaningful construct when discussing specific dimensions one is interested in comparing (Edwards, 1993). Therefore, one must ask which dimensions of congruence might be important to the study of group therapy?

Dimensions of Congruence

Group climate. Within the literature on group dynamics, group climate has been operationalized as being composed of the elements of engagement, avoidance, and conflict and that these elements can be measured in terms of level (i.e. high or

low) (Mackenzie, 1983). All groups have a climate (Mackenzie, 1983). Therefore, a group member will likely have some sense of what it is like to be in a particular group. Because of the important role that group climate, particularly the level of cohesiveness in a group's climate plays in terms of group member outcome (Kivlighan & Holmes, 2004), it seems valuable to assess congruence between the individual and the group on the dimension of how the group's climate is perceived.

Intimate behaviors. Additionally, fostering intimacy has been conceptualized as one of the most fundamental goals of group therapy (Shadish, 1984). Shadish (1984) defined intimacy as “increased awareness of and ability to deal with emotional, cognitive, and behavioral functioning of the self (intrapersonal intimacy) and of others and the relationship of self to others (interpersonal intimacy)” (p. 205). Congruence in the level of intimate behaviors expressed during group sessions was found to be predictive of future session attendance (Paquin et al., 2011). Therefore, it may be further illuminating to assess the level of congruence between an individual and her group on the dimension of intimate behaviors enacted during group sessions.

In sum, the current study seeks to understand how congruence and convergence on the dimensions of perceptions of group climate and the level of intimate behaviors enacted during group therapy sessions relate to individual group member outcomes. In other words, does it matter that Tania is more congruent with her group on these dimensions? If yes, in what ways does it matter? And how might changes in her congruence, convergence over time (if observed), affect how well she does at the end of treatment? Research on group processes is complicated by the numerous problems presented by small group data with multiple observations

gathered over time. Therefore, models of analyses that both account for these inherent problems and maximize interpretability of the data will be discussed in detail.

Chapter 2: Review of the literature

Group Therapy

In a review of the empirical literature on group therapy process and outcome research, Kivlighan, Coleman, and Anderson (2000) document that not only is group psychotherapy as a treatment modality ubiquitous, but that it works. Specifically, results of meta-analyses have demonstrated that group counseling is more effective than waitlist controls (Hoag & Burlingame, 1997; McRoberts, Burlingame, & Hoag, 1998), that under certain circumstances group counseling may be more effective than individual therapy (McRoberts, Burlingame, & Hoag, 1998; Tilitski, 1990), and that group counseling is effective with specific client populations, including both men and women, individuals struggling with eating disorders, depression, and the sequelae of childhood sexual abuse (de Jong & Gorey, 1996; Fettes & Peters, 1992; Gorey & Cryns, 1991; Reeker, Ensing, & Elliott, 1997).

However, despite the evidence supporting the efficacy of group counseling, there remains much to know. For example, not all patients get better after completing group treatment, and early drop out from group remains a problem in most treatment settings (Kivlighan, Coleman, & Andersen, 2000; Paquin, et al., 2011). It appears that little is fully understood about the underlying mechanisms of change germane to group therapy, including variables related to successful (and unsuccessful) courses of treatment (Kivlighan & Holmes, 2004; Kivlighan, Miles, & Paquin, in press). How group therapy researchers have traditionally attempted to account for client change as a group process is briefly examined in the section that follows.

Therapeutic factors. Group therapy theorists and researchers increasingly focused on process variables and their relationship to outcomes in the 1980s and 1990s to answer the complex question of how clients get better (or fail to improve) as a result of participating in group treatment. Yalom (1968/2005), building upon the work of other group theorists and researchers, developed a compendium of 11 (in a condensed model) therapeutic factors he believed were the variables necessary for a successful course of group therapy. These factors include: Interpersonal Learning (input and output), Catharsis, Cohesiveness, Self-understanding, Existential Factors, Universality, Instillation of Hope, Altruism, Family Re-Enactment, Guidance, and Identification. These factors were intended to capture a basic framework for understanding the most crucial and fundamental components of the change process in group therapy. From within this framework, Yalom (2005) posited that group practitioners could employ “tactics and strateg[ies]” to enhance the therapeutic nature of groups across settings, people, and problems (p.1).

In addition to this enormous contribution, Yalom and his colleagues established a research paradigm that centered on measuring the change process from the perspective of the group member, through the member’s rank-ordering of the set of therapeutic factors. Since then, decades of studies have revealed the following about the therapeutic factors: they are fairly consistently rank-ordered; the relative importance of the therapeutic factors seems to change over time; and they appear to change as a function of the type of group (Kivlighan & Holmes, 2004). However, in their recent review and critique of the literature on therapeutic factors, Kivlighan, Miles, and Paquin (in press) note that despite more than 20 years of research on therapeutic factors, there is still little understanding of

how the factors are linked with outcomes. For example, how might therapeutic factors, such as group cohesiveness and self-disclosure, affect group member outcomes?

Group cohesion and self-disclosure. Group cohesion is part of what comprises a group's climate. Among the therapeutic factors, group cohesiveness has been described as "so important and complex" to group processes, that it is in a class by itself (Yalom, 1995, p. 2). Noted social psychologist Leon Festinger (1950) discussed cohesion in any social group as referring to all of the forces that keep a group together. One such force is group member self-disclosure. Common sense dictates (and several studies have shown) that self-disclosure by group members is related to a group's development of cohesion over time (Bloch & Crouch, 1985). In their review of the research related to findings specific to therapeutic factors in group therapy, Bloch and Crouch (1985) further contend that not only is self-disclosure related to cohesion, but it is the bulwark of interpersonal, or intimate, behaviors in group therapy. To illustrate both their conceptualization of meaningful self-disclosure, as well as its importance in group therapy, the authors argue that the adage "Know thyself" should be superseded by "Make thyself known, and thou shalt then know thyself" (p. 130).

In sum, making self-disclosures in group therapy can reasonably constitute an intimate, interpersonal interaction, and self-disclosure as a discrete behavior in groups is related to group cohesion (Bloch & Crouch, 1985). Furthermore, there must be some level of cohesion in a group in order to measure other therapeutic factors (Bloch & Crouch, 1985; Festinger, 1950; Yalom, 2005) as well as other variables of interest, such as congruence or "fit" between a member and her group.

While the development and taxonomies of the therapeutic factors are grounded in the group counseling literature, interestingly, research on the therapeutic factors has not really incorporated a focus on *the group* (Kivlighan, et al., in press). For example, researchers have studied the relationship between an individual group member's perceptions of therapeutic factors and the outcomes of that member, but have ignored how the perception of therapeutic factors by the other group members affects the individual member's outcome. "Fit" is an important area of study because "fit" simultaneously examines both the individual group member and the group as a whole. To that end, the present study seeks to understand how congruence between an individual group member and the group, in the domains of perceptions of group climate (including cohesion) and interpersonal behaviors (including self-disclosure), affects an individual group member's outcome.

Congruence

In 1938, Kurt Lewin, founder of social psychology and prolific researcher of group dynamics, noted that behavior is a function of the interaction of the person and the environment. Congruence can thus be understood as a component of this interaction between people and their environment, with the potential to be either high or low in congruence. Returning to the example of Tania and Liz – we could conceptualize one group member as being high (Tania) and the other as low (Liz) in congruence with her respective group. Not to be confused with Carl Rogers' (1942) use of the term, congruence, as used in this context, can be described as the fit between an individual and her or his environment. In the literature on group psychotherapy process and outcome, only one known study to date has attempted to measure a construct approximating

congruence in groups among members (Flowers, 1974). However, several studies have examined convergence (analogous to congruence, occurring over time) in process and outcome research in dyadic therapy (Al-Darmaki & Kivlighan, 1993; Borghi, 1968; Gulas, 1974; Kivlighan & Gayle, 2000; Pepinsky & Karst, 1964; Sandler, 1975).

Convergence research. The terms ‘convergence’ and ‘congruence’ have often been used interchangeably in the process and outcome literature in individual therapy, and the importance of the construct has been well-documented. As noted by Gelso and Carter (1985), “congruence in worldview” between an individual client and his or her therapist is important for a successful working alliance (p. 164). Most often, congruence developed over time has been referred to as *convergence* although this distinction has not been consistently made in the literature. Pepinsky and Karst (1964) defined convergence as a “lessening of discrepancy in judgments made by pairs of subjects” (p. 333). They viewed convergence as a “general phenomenon occurring across a wide array of social interactions,” including counseling (p. 333). Using this framework, studies have examined how convergence and congruence of therapist and client perceptions and expectations relates to individual psychotherapy process and outcome. Gulas (1974) found that clients and therapists who were high on convergence in terms of their role expectations had better counseling outcomes. In their study, Kivlighan and Gayle (2000) found that convergence of client and therapist recall of critical events in sessions increased over time, and that this pattern of increasing congruence was related to better counseling outcomes.

Further, a lack of congruence between client and counselor expectations for therapy has been found to relate to premature termination of therapy by clients (Borghi,

1968; Sandler, 1975). In each case, congruence/convergence was measured using difference scores whereby the smaller the score, the closer the dyad in terms of their convergence on a given dimension. Taken together, congruence appears to play a role in individual therapy; however, little is known about how congruence might operate in the context of group therapy, whether this is related to individual group member outcomes, and how congruence might be measured in this context. One must look toward other domains such as vocational and industrial/organizational (I/O) psychology to examine how congruence or “fit” has been studied outside of counseling research and in the context of groups of individuals (rather than pairs).

Models of fit. Congruence represents the “key construct” of the Person-Environment (P-E) model (Spokane, Meir, & Catalano, 2000, p. 138). While P-E fit models cut across domains of psychology, P-E fit is the dominant research paradigm in vocational psychology (Spokane, Meir, & Catalano, 2000). Congruence as a variable has been examined in several ways within the fields of vocational and I/O psychology. Chief among them are person-environment (P-E) and person-organization (P-O) models of congruence. The former refers to how closely an individual’s interests match the particular characteristics of her work environment, while the latter refers to the “compatibility between people and the organizations in which they work” (Kristof, 1996, p. 1). In both cases, the potential for congruence exists between the characteristics of an individual and of an environment/organization. Congruence in these domains is related to both attitudinal and behavioral outcomes of interest to vocational researchers (Hoffman & Woehr, 2006).

John Holland's (1959) theory of vocational choice changed the way psychologists think about people and work, and is an example of a P-E fit model. Spokane, Meir, and Catalano (2000) reviewed 66 P-E fit studies "operationally defined by Holland's (1959) theory," (p. 140) examining the construct of congruence. The authors note that a lack of congruence between people and their work environment has been found to correlate with a lack of well-being (e.g., anxiety, somatic complaints). Further, the authors conclude that congruence "appears to be a sufficient, though not necessary, condition for job satisfaction" (p. 137). In a similar review and meta-analysis of P-O congruence, Verquer, Beehr, and Wagner (2003) found that P-O fit was related to an individual's intent to quit, level of job satisfaction, and level of commitment to the organization. Further, Hoffman and Woehr (2006) found that P-O fit was moderately related to behavioral outcomes, including turnover, citizenship behavior, and task performance. In sum, P-O congruence has been found to play a role in both attitudinal and behavioral outcomes in vocational psychology.

Hoffman and Woehr (2006) note that various dimensions of P-O congruence have been examined, as congruence has been defined in multiple ways including value congruence, goal congruence, needs-supplies fit, and demands-abilities fit. In both the Hoffman and Woehr (2006) and Verquer, Beehr, and Wagner (2003) reviews, the authors note that (a) which dimension of congruence (e.g., values vs. goals) and (b) the method used to measure this fit (e.g., subjective vs. objective; difference scores vs. similarity profiles) moderated the relationship between fit and outcomes. Therefore, the researchers recommend that the role of congruence be assessed on discrete dimensions (compare

perceptions with perceptions, and behaviors with behaviors) using triangulated data sources (self-reports and observer ratings) across time.

Congruence as potentially important in psychotherapy groups. John Holland (1973) posited that investigative (or I-type) environments are “I” environments because they are comprised of “I”-type people. In other words, rather than the static or technical aspects of work environments, it is the people (and their associated characteristics) within these environments that constitute the critical, or defining, aspects of the environment. Analogously, it is the other group members that constitute the environment for the individual group member. Given this analogous relationship between person and environment with group member and group, how then, might congruence—a variable that has been shown to be important to consider when examining person-to-work environment outcomes—relate to a group member and her group? Before turning away from the fields of vocational and I/O psychology, recent research related to person-group (P-G) fit is reviewed, with attention given to findings relevant to the current study.

Person-group fit. Perhaps the closest “cousin” to congruence research in a group psychotherapy context is the construct of person-*group* (P-G) fit in vocational and I/O psychology. Some recent research has examined P-G fit in an attempt to test more parsimonious questions about the effects of worker-group congruence within organizations (Adkins et al., 1996; Judge & Ferris, 1992; Kristof-Brown & Stevens, 2001; Kristof-Brown et al., 2005 Werbel & Gilliland, 1999). In this context, P-G fit refers to the congruence between a worker and her immediate peer or work group (rather than with co-workers with whom she/he rarely has contact, or the larger organization itself). The theoretical rationale behind person-group fit in this context is that the interpersonal

match between an individual and her/his immediate peer or work group has a direct effect on outcome, or an indirect effect as it may moderate or mediate other P-O relationships.

In this domain, P-G fit has been operationalized in several different ways; most often, individuals are compared to their coworkers in terms of goals (Kristof-Brown & Stevens, 2001), values (Adkins et al., 1996), or personality traits (Kristof-Brown et al., 2005).

In a study conducted by Judge and Ferris (1992) the authors constructed a new instrument to assess P-G fit, since no widely accepted validated measure existed. The scale consists of five items using 7-point Likert responses. A sample item from the scale includes: “Working with the other people in my group is one of the best parts of my job.” The reported α coefficient for this scale is 0.76. The researchers found a positive relationship between P-G fit and compliance with important group norms, enhancing group performance, having better work relationships, and a higher likelihood of providing and accessing resources within the group. Individuals with higher amounts of perceived P-G fit are also more likely to make significant contributions to their groups. In a study conducted by Vogel and Feldman (2009), the authors found that P-G congruence moderated the relationship between P-O fit and outcomes. Specifically, for workers with a low degree of P-O fit (i.e., the worker’s values do not match the values of the company overall), a high degree of P-G fit weakened the relationship between P-O fit and outcomes, such that these individuals had positive outcomes despite the low P-O fit. These positive outcomes included in-role job performance, organizationally directed citizenship behavior (e.g., following important group norms) and job satisfaction (Vogel & Feldman, 2009).

In sum, the findings from P-G fit studies examining the role of congruence between an individual and her or his work group indicate that congruence plays a role in both group and individual level outcomes. Group related outcomes include compliance with important group norms, enhancing group performance, having better work relationships, and a higher likelihood of providing and accessing resources within the group. Individual related outcomes include in-role job performance, organizationally directed citizenship behavior, and job satisfaction. Clearly, this research suggests that the construct of fit plays a role in work settings with regard to outcomes. Might congruence between an individual group member and her or his psychotherapy group play a role in individual group member outcomes?

Congruence in group psychotherapy process and outcome. As noted above, only one study has been conducted approximating the construct of “fit” in the literature on group psychotherapy process and outcome (Flowers, 1987). Flowers (1987) looked at the perceptions of curative factors in group therapy among group members who improved after treatment and those who did not. He found that for patients who improved, their rank-ordering of curative factors was similar to the other members of their groups. For patients who did not improve, their rank-ordering of curative factors were different from the other members of their groups, and that these were in turn different from the patients who improved. The author concluded that a lack of congruence between a member and his or her group accounted for the poorer outcomes (Flowers, 1987). However, there were many flaws in the study’s design, and thus, conclusions about the role of congruence in predicting patient outcomes are likely inappropriate. While the study’s strength was its repeated measures design (treatment satisfaction was measured after every session), the

study suffered from several limitations. First, the researcher only measured perceptions of curative factors at two points in time—at the beginning and end of treatment—rather than after every session, thus weakening any conclusions drawn about the role of change in congruence in client change. Second, the study focused only on client perceptions of the helpfulness of therapeutic factors, rather than perceptions of group climate (an inherently group-level variable).

Further, the study did not opt to measure in-session behaviors to corroborate participant reports of which factors were helpful with actual behaviors enacted during group. Next, improvement, or client change, was measured by change in a participant's DSM diagnosis, rather than a set of discrete symptoms taken at pre and post-test. For example, change in DSM diagnosis might not be a sensitive enough (or even appropriate) outcome measure if one is interested in client growth, improvement in functioning, or decrease in specific symptoms. In other words, group treatment might be effective in reducing symptoms, enhancing interpersonal skills, and improving an individual's quality of life, even if that individual still meets criteria for DSM diagnoses – thus, meaningful client changes may be missed.

Lastly, researchers interested in assessing congruence between entities (e.g. between a group member and his/her group) are encouraged to use normative, rather than ipsative measures (Edwards, 1993). Most notably, the use of ipsative measures such as Q-sort and ranking methods (Flowers, 1987) are inappropriate measures to use when assessing congruence (Edwards, 1993). Ipsative measures are scaled separately within each entity and therefore provide no information regarding the magnitude of the difference between entities.

Fit in the present study. The present study sought to add to the current literature on group psychotherapy process and outcome in several ways. First, the current study introduces the construct of “fit” to the group psychotherapy literature. Specifically, using a session level analysis, the current study examined the role of fit on two dimensions: Group Climate and Intimate Behaviors. How group members perceive the climate of their group has been found to be related to group member outcomes (Kivlighan & Tarrant, 2001; Ogrodniczuk & Piper, 2003). Less is known about outcomes for group members who perceive a different group climate than the others in their groups. Therefore the present study set out to understand how congruence between a group member and her group in terms of perceptions of group climate relates to individual treatment outcomes.

Additionally, the ability to engage in intimate behaviors during group sessions such as making important self-disclosures, asking other group members for feedback, and/or disclosing one’s own thoughts or feelings even if they are threatening or unpopular has been linked with positive outcomes in group treatment (Bloch & Crouch, 1997; Kivlighan, Coleman, & Andersen, 2000; Shadish, 1987) and specifically in groups with survivors of childhood sexual assault and other interpersonal trauma (Gerrity & Peterson, 2004; Ford, Fallot & Harris, 2009). However, what are the implications for an individual engaging in a level of intimate behaviors that is not reflected by the other members of his or her group? Does “fit” matter in terms of these kinds of behaviors? And if so, how?

In addition, through the use of both behavioral and perceptual measures it was hoped that some comparisons could be made with regard to which is more important in relation to congruence and outcomes. Moreover, the use of Hierarchical Linear Modeling

(HLM; Raudenbush & Bryk, 2002) to model session data over time allowed for a more sophisticated understanding of how congruence may change over time.

Lastly, group research has long suffered from inadequate modeling of group effects (Kivlighan et al., in press). Using models such as the Actor-Partner Interdependence Model (APIM; Kenny, Kashy, Manetti, Piero, & Livi, 2002) allows researchers to model how one person (the actor) affects and is affected by the other (the partner). In recent studies, the APIM has been used in small group research (Bonito, DeCamp, Coffman, & Fleming, 2006; Miles, Paquin, & Kivlighan, under review; Paquin et al., 2011). In group research, the actor may be the target group member, while the partner is the other group members. This approach addresses the problems of nesting inherent to small group data and allows researchers to capture the variance accounted for by the “groupiness” of group therapy. Through the use of the APIM, the current study was able to measure the impact of the other group members on the individual, as well as the relationship between individual-group congruence and outcomes.

Group therapy as a modality is growing in treatment settings around the globe (DeLucia-Waack, Gerrity, Kalodner & Riva, 2004). Group therapy is currently practiced in settings as divergent as college counseling centers, VA hospitals, and prisons (DeLucia-Waack, et al., 2004; Kivlighan, et al., 2004). Across these settings, client populations are presenting with histories of chronic trauma, including childhood abuse and/or other interpersonal trauma, and chronic or acute posttraumatic stress disorder (PTSD). How might congruence between a group member and her group operate within a prison population being treated for exposure to interpersonal trauma? And why might

understanding the mechanisms of change inherent to a group trauma treatment be so important in a prison setting?

Context for Current Study: Women in Prison

Perhaps unsurprisingly, mental health treatment for incarcerated individuals has been historically and nearly exclusively informed by research and practice with male prisoners. Women comprise just over seven percent of the total incarcerated population (Harrison & Beck, 2006). However, women are the fastest growing segment of incarcerated populations. In 2007, it was estimated that within the next five years, the number of female prisoners is expected to grow by 16 percent, compared with 12 percent for men (Pew Charitable Trusts, 2007). Despite the current rapid rates of growth among female prisoners, it is still possible to attend major conferences in the field of corrections and hear only “the male pronoun” used (Talvi, 2005, p. 13). This is problematic for several reasons. Women are entering the criminal justice system in different ways from men, and are coming in with a different set of issues. Women are most often involved in nonviolent offenses, crimes related to drug use or distribution, and are typically primary caregivers for one or more children at the time of incarceration (Government Accountability Office, [GAO], 1999).

Furthermore, several studies have demonstrated the high rate of sexual and physical abuse histories among incarcerated women compared with the general population of women (Brown, Miller, and Maguine, 1999). It has been documented that one-quarter to one-half of women in state and federal prisons report having histories of childhood physical or sexual abuse (GAO, 1999) and childhood abuse is linked with later problems in psychosocial functioning among women offenders, including substance

abuse, high-risk sexual behaviors, PTSD, and other mental health issues (Gerrity & Peterson, 2004; Lamoureux et al., 2010; Neumann, Houskamp, Pollock, & Briere, 1996). In a large scale interdisciplinary study conducted by UCLA researchers, the authors compared treatment outcomes for incarcerated men and women “entering prison-based therapeutic community treatment” (n = 4,386 women and 4,164 men). Among the study’s results, women were found to be at a significant disadvantage to men in terms of psychological functioning, histories of employment, drug abuse, and exposure to sexual and physical abuse prior to incarceration (Messina, Burdon, Hagopian, & Pendergast, 2006).

Taken together, these findings paint a complex clinical and contextual picture for incarcerated women: a high degree of exposure to sexual and physical trauma, substance abuse, other mental health issues, employment problems, and chronic experiences with marginalization through poverty, sexism, and racism (Fallot et al., 2009). Therefore, therapeutic treatments that address all of these issues concurrently are essential.

Rather than relying on treatments developed for male offenders, many feminist psychologists and clinicians have argued for the application of “gender-responsive” treatment for women who are interfacing with the criminal justice system; approaches that, without essentializing gender differences, take into account the unique pathways in which women enter the criminal justice system (e.g. drug offenses; non-violent offenses) and the issues they bring with them (e.g. exposure to sexual abuse, intimate partner violence, pregnancy and childcare) (Fallot & Harris, 1998; Messina et al., 2006). One such treatment protocol is the Trauma Recovery Empowerment Model (TREM) (Fallot & Harris, 2005). The TREM (used in the current study) is a feminist model of treatment

specifically developed for women recovering from trauma and substance use. A small but growing body of evidence exists demonstrating the feasibility of TREM, along with some evidence of clinical significance (Fallot & Harris, 2001; Fallot & Harris, under review; Fallot, McHugo, & Harris, 2001; Paquin, in preparation; Toussaint & VenDemark, 2007).

Trauma

Trauma defined. Psychological trauma refers to the damage caused to the psyche by a single, or series of, traumatic events (International Society for Traumatic Stress Studies [ISTSS], 2009). These events can include natural disasters, war, torture, sexual or physical abuse, or witnessing violence. Common among traumatic events is their unpredictability and power to wreak havoc on the lives of trauma survivors (Marvasti, 2004). Traumatic events threaten an individual's fundamental sense of security and belief that the world is a safe place. Furthermore, psychological trauma can overwhelm a person's abilities to cope with and make sense of the thoughts and feelings associated with the traumatic event (Ford & Courtois, 2009).

Physiologically, traumatic events overwhelm the stress response system, and can have lasting effects on an individual's ability to cope with stress. In particular, prolonged or chronic exposure to traumatic stressors such as childhood sexual and physical abuse, intimate partner or interpersonal violence, severe poverty, and/or racism during important developmental periods can influence neurobiological processes important for such things as emotion and memory, leading to later problems in functioning (Gerrity & Peterson, 2004; Lamoureux et al., 2010; Marvasti, 2004; Neumann, Houskamp, Pollock, & Briere, 1996). Such problems can include trouble with executive functioning, attention, cognitive processing, emotion regulation, memory formation, interpersonal functioning, and an

underlying vulnerability for developing posttraumatic stress disorder (PTSD) (Briere, 1997). Repeated exposure to traumatic events, such as child abuse (CA) or interpersonal trauma (IT) such as rape and/or intimate partner violence, can be insidiously and pervasively harmful, and more is known about the effects of such abuse on girls and women, than on boys and men. As noted by FalLOT and Harris (2004),

Profound and repeated abuse is seen as a life-altering event that affects a woman's development and functioning across the life span and has an impact on a wide range of areas of functioning (p. 189).

While not everyone exposed to traumatic events will develop PTSD or struggle with trauma-related symptoms, many people do. For those individuals that do develop PTSD, complex PTSD¹, or trauma-related symptoms not meeting DSM-IV-TR criteria for PTSD (i.e., subclinical PTSD), symptoms manifest themselves in a variety of ways, and may vary in their intensity, duration, and frequency (Ford & Courtois, 2009; Herman, 2009; Marvasti, 2004). Symptoms can include flashbacks to the traumatic events, intrusive thoughts, sleep disturbances, and hyper-vigilance or hyperarousal (Ford & Courtois, 2009).

Furthermore, exposure to multiple, human-caused interpersonal traumas such as CA and IT appear to have distinct psychological sequelae distinguishing survivors of this brand of traumatic exposure from others (Gerrity & Peterson, 2004; Ford & Courtois, 2009; Herman, 2009). Specifically, somatization, dissociation, and affect dysregulation – the three “cardinal” symptoms of chronic trauma (or C-PTSD) – are almost always present among survivors of childhood trauma, are less common for trauma experienced in

¹ Not currently recognized in DSM-IV-TR, Complex PTSD (C-PTSD) is defined by clinicians and researchers as a biopsychosocial human injury due to repeated and protracted exposure to social or interpersonal trauma (i.e. child abuse) that presented no viable “escape route” for the victim (Herman, 2009).

adolescence and adulthood, and rarely among people who have experienced a single acute trauma related to a natural disaster (Herman, 2009, p. xiii). These “cardinal symptoms” have enormous potential to significantly disrupt interpersonal interactions. For example, it is common for treatment-seeking complex trauma survivors to have difficulty trusting others and engaging in successful, intimate relationships with friends, family, significant others, and treatment providers (Gerrity & Peterson, 2004; Marvasti, 2004).

Rates of trauma among incarcerated women. Women comprise just over seven percent of the total incarcerated population (Harrison & Beck, 2006). However, in 2007 it was estimated that within the next 5 years, the number of female prisoners is expected to grow by 16 percent, compared with 12 percent for men (Pew Charitable Trusts, 2007).

Several studies have demonstrated the high rate of sexual and physical abuse histories among incarcerated women compared with the general population of women (Brown, Miller, and Maguine, 1999; Owen & Bloom, 1995; Singer, Bussey, Song, & Lunghofer, 1995). One-third of female state prison and jail inmates report being abused as children, compared with 12-17% of the general population (Bureau of Justice Statistics, 1999). One-third of women in state prisons said they had been raped before their incarceration, compared with 3% of men (Bureau of Justice Statistics, 1999). Ninety-percent of incarcerated women who spent most of their childhood in foster care or juvenile institutions report being physically or sexually abused (Bureau of Justice Statistics, 1999). Of women state prisoners who grew up with a parent who abused alcohol or other drugs, 80% said they were abused by those adults (Bureau of Justice Statistics, 1999).

Childhood abuse is linked with later problems in psychosocial functioning among women offenders, including substance abuse, high-risk sexual behaviors, personality disorders, PTSD, and other mental health problems (Jordan, Schlenger, Caddell, & Fairbank, 1997; Zlotnik, 1997). Childhood abuse can also leave women vulnerable to being in abusive adult relationships (Lamoureux, et al., 2010; Neumann, Houskamp, Pollock, & Briere, 1996). Among prisoners who reported past abuse, more than half reported being abused by a significant other (Bureau of Justice Statistics, 1999). Furthermore, women are at risk for abuse in prison: corrections staff engaging in exploitive relationships with women inmates is a documented problem (DOJ, 2005).

In sum, incarcerated women seeking mental health services are presenting with a high degree of repeated exposure to sexual and physical interpersonal trauma, other mental disorders, substance use disorders, and are at risk for re-victimization in prison. Therefore, treatments addressing these issues concurrently are essential.

TREM. Currently, there are a number of empirically supported trauma and PTSD treatment models endorsed by the ISTSS including (but not limited to) prolonged exposure, cognitive-behavioral, stress-inoculation, and other cognitive therapies (ISTSS, 2008). Ford, Courtois, Steele, Van der Hart and Nijenhuis (2005) discuss the current literature on trauma treatments with a specific focus on treating survivors of childhood sexual trauma. Specifically, the authors discuss the common elements among treatment models used for working with this population. These models include a common emphasis on developing coping skills, recalling or reprocessing traumatic memories, and a focus on interpersonal functioning. Furthermore, group treatments, as opposed to individual therapies, hold a special promise for trauma survivors and have been viewed by experts

as offering a “direct antidote to the isolation and social disengagement that characterize posttraumatic stress disorder [PTSD] and complex traumatic stress disorder” (Ford et al., 2009, p. 415). While group treatment of trauma has not been rigorously tested in randomized clinical trials, the scientific evidence of its efficacy is “limited, but growing” (Ford et al., 2009, p. 417). Both short and longer-term group therapies have been found to be effective (Gerrity & Peterson, 2004; Ford et al., 2005; Ford et al., 2009).

TREM (Fallot & Harris, 2001/2002; Harris, 1998) can be contextualized within this broader literature on trauma treatments for survivors of sexual trauma and is an example of an interpersonal self-regulation and affect regulation therapy (IAT) (Najavits, 2002). IATs, by definition, contain the following treatment components: A focus on teaching specific skills for social problem solving, the use of both current stressors and past trauma memories as “vehicles” for looking at and changing problematic interpersonal decisions and emotions, and specifically addressing client attachment to the therapist (or group) as a strategy to enhance client self-regulation. Similar to the more widely known treatment model of Seeking Safety (Najavits, 2002), TREM is an IAT developed for adult women (rather than girls and adolescents) with co-morbid trauma histories and substance abuse disorders.

TREM is a manualized group treatment model developed at a community mental health agency serving women survivors of trauma with co-morbid substance abuse and mental illness (Fallot & Harris, 2004; Harris, 1998). The TREM approach is predicated on the belief that trauma and substance use are intimately linked and that successful treatment must involve attending to both issues simultaneously. Further, the group modality of TREM is a crucial component of creating a recovery community of support

and a forum to have new, affirming interpersonal experiences. The TREM treatment manual is the result of an iterative process based on feedback from group leaders and group participants.

According to TREM originators Maxine Harris (1998) and Maxine Harris and Roger Fallot (2002), other key elements of TREM include:

A) basic education about physical and sexual abuse and how current behaviors are linked to past abuses; B) a reframing of current symptoms as attempts to cope with unbearable trauma; C) an appreciation for the problem-solving attempts locked and hidden in certain repetitive behaviors, D) education focusing on basic skills in self-regulation, boundary maintenance, and communication; E) basic education about female sexuality, correcting misperceptions and misconceptions; F) creation of a healing community by providing recovery services within a group; G) rediscovery of and reconnections to lost memories, feelings, and perceptions; H) an opportunity for women to experience a sense of competence and resolution as they face the demons from the past; I) an opportunity for women to trust their own perceptions about reality and to receive validation from others for these perceptions (p. 478-480)

Based on these principles, the predominant interventions involved in TREM are cognitive restructuring, skills training, psychoeducation, and peer support (Fallot & Harris, 2002).

TREM is a relatively new treatment approach, and empirical research examining the potential benefits of the treatment is nascent. Despite this, it has received some national attention by the Substance Abuse and Mental Health Services Administration (SAMHSA)'s National Registry of Evidence-based Programs and Practices (NREPP), receiving a rating of 3.4 out of 4 based on empirical support and clinical significance (NREPP, 2009). Existing outcome studies of TREM (a total of four studies) can best be characterized as pilot or feasibility studies. These preliminary studies primarily asked the questions 1) can we implement this program, and 2) will consumers of this treatment be satisfied? Two of these four studies—quasi-experimental studies—went beyond these initial questions. These studies examined the efficacy of TREM in treating PTSD,

substance use disorders (SUDs), and other relevant outcomes (Fallot & Harris, 2001; Fallot & Harris, under review; Fallot, McHugo, & Harris, 2001; Toussaint & VenDemark, 2007). All four studies are reviewed below, with specific attention to their findings related to PTSD and interpersonal functioning.

Three studies were conducted at various agencies where TREM was being used, and published in a report by the agency where the treatment was developed. Researchers not affiliated with TREM originators conducted and published the fourth study independently. Two of these studies (Fallot & Harris, 2001; Fallot, McHugo, & Harris, 2001) tested the face validity of the treatment, while the third (Fallot & Harris, under review) and fourth (Toussaint & VenDemark, 2007) used quasi-experimental, non-equivalent groups design to examine the effectiveness of the TREM groups.

Feasibility studies. Two program evaluations were conducted at a mental health agency in Washington, DC. Fourteen women completed the treatment and interviews and assessment data were gathered. In Philadelphia, two TREM groups were conducted at a mental health agency (the N of these groups is not reported) (Fallot, McHugo, & Harris, 2001). At treatment completion, group members reported that the treatment was helpful to them, they felt supported, they experienced more control over their lives, were more able to assert themselves, and were involved in safer relationships. Further, group members reported decreases in alcohol and drug use, mental health symptoms, and decreased use of inpatient services (like emergency rooms). According to the study authors, these member reports corresponded with clinician reports of member outcomes, as well (Fallot & Harris, 2001). While the goal of determining whether the treatment was feasible or not was met through these studies, the generalizability of these findings is

limited due to their research design (descriptive field) and reporting (missing N in some cases; no response rate).

Quasi-experimental studies. Fallot and Harris (under review) used a quasi-experimental, nonequivalent control group design comparing TREM groups at a Washington, DC community health agency with treatment as usual (group treatment without a focus on trauma) at a similar agency in Baltimore, Maryland. The TREM sample consisted of 153 female participants and the Baltimore no trauma-focused sample consisted of 98 women. Measurements were gathered at baseline, and groups were similar with the exception of a higher likelihood for alcoholism in the Baltimore sample. Upon completion of treatment, measurements were again taken at 6 and 12 months following treatment. Participants were asked to complete several outcome measures, including the PTSD Symptom scale, Brief Symptom Inventory, Addiction Severity Scale, and the Symptom Checklist–90 (SCL-90). Participant attendance and participation were also assessed, as was clinician fidelity to treatment protocol. Lastly, clinicians conducted cross-site clinical interviews to assess health related quality of life (SF-12), ratings of substance abuse and Multidimensional Measure of Religiousness/Spirituality [MMRS] and in the DC sample stage of trauma recovery (TREM Profile).

An omnibus test showed significant differences between the TREM and comparison groups on 3 of the 4 measures, including PTSD symptom severity. For women in the TREM groups, their PTSD symptoms at baseline (n=149) were 24.73, at 6 months (n=121) were 20.66, and at 12 month follow up (n=103) were 18.18. Women in the comparison group (n=93) were 26.92 at mean, 25.44 at 6 months (n=66), and 24.06 at 12 months (n=63). Further, lower substance use ratings were correlated with the

following: changes in self-awareness, $r = .35$, $n = 95$, $p < .01$) sense of purpose $r = .34$, $n = 95$, $p < .01$) relational mutuality $r = .32$, $n = 95$, $p < .01$), self-soothing, $r = .28$, $n = 95$, $p < .01$) and emotional modulation ($r = .28$, $n = 93$, $p < .01$).

In another quasi-experimental study, Toussaint and VenDemark (2007) used a similar approach to examine the potential effects of TREM compared with a no-trauma-focused treatment used in a residential treatment facility. The authors found that TREM women showed better outcomes on trauma-related symptoms than treatment-as-usual, although not on alcohol or substance abuse (no differences were detected between treatments, although both groups showed improvement and neither group reverted to baseline levels of use). The limitations of these pilot studies include a lack of random assignment and nonequivalent groups—at baseline, the samples were significantly different on sociodemographic variables including race and SES, and severity of trauma and psychopathology.

In sum, “field testing” of TREM has shown clinical significance in PTSD symptom change and improvements in self-regulation and social adjustment for TREM participants (Ford et al., 2005, p. 444). Further, in a separate, preliminary analysis (Paquin & Drogosz, in preparation) TREM participants at a state correctional facility appeared to outperform participants in another trauma treatment (Beyond Trauma, Covington, 2001) on PTSD symptom change, and overall showed significant improvement in PTSD symptomatology. Furthermore, group therapy as a modality has been shown to be effective for treating a variety of disorders including trauma and PTSD (Kivlighan et al., 2000). TREM is a new group trauma treatment that shows some clinical significance regarding the treatment of PTSD for women with co-morbid substance use

disorders (Fallot, McHugo, & Harris, 2001; Ford & Courtois, 2005; Paquin & Drogosz, in preparation; Toussaint & VanDemark, 2007). However, little is understood about the underlying mechanisms of change over the course of treatment in group therapy, including TREM groups. The current study represented a first effort at exploring whether the concept of congruence, or fit, has a role to play in what is happening for individual group members participating in TREM groups, and how this might be related to outcomes.

Measuring Congruence

There are many theoretical and conceptual issues regarding how best to measure congruence, most of which hinge on the type of questions a researcher is interested in asking and how the data will be interpreted. In his chapter, Funder (1997) discusses the theoretical and methodological issues inherent to a specific type of congruence research: self-other congruence research. His chapter is instructive as it provides an overview of the different ways congruence research in the domain of personality psychology has attempted to answer the question, “what is this person like?” (p. 619). He outlines the ways in which self-other congruence has been operationalized to address this question. He states that each way (asking the target to predict what others would say about her, asking others to predict how the target would describe herself, etc.) both reveals much of the investigator’s primary interest, and has implications for how the answers should be interpreted (p. 621). In the current study, self-other congruence is analogous to person-group congruence. For instance, where Funder might be concerned about whether “people give themselves higher ratings, on average, of desirable traits than their acquaintances?” (p. 621) the current study asks, “Do people rate their groups higher on

engagement (for example) than the other members of their groups?” and whether the level of congruence of these ratings relates to outcomes.

Assessing this type of “fit” between an individual and the environment can be done in multiple ways. One can obtain a perceptual assessment of fit through asking participants to report how closely they believe they align with their environments on various dimensions (Hoffman & Woehr, 2006; Spokane, Meir, & Catalano, 2000). This approach makes sense if a researcher is interested only in one side of the fit equation—the individual’s subjective assessment of her or his fit. However, because fit is by definition a dynamic, interactive construct, construct validity suffers as a result of this approach as it cannot capture (and perhaps obscures) a person’s “true” fit with her environment.

A different approach to measuring congruence is through comparison of scores between two entities (e.g., the person and organization, or in the case of the present study, the target group member and the other group members). Most often, congruence has been operationalized as “the algebraic, absolute, or squared difference between two component measures or as an index representing similarity between profiles of component measures” (Edwards, 1995, p. 307). Algebraic difference scores (ADS) are the most intuitive method of measuring how congruent one entity is to another (Edwards, 1995). For example, if Liz rates her group as low in engagement (a score of 2) and the rest of the group members rate the group as high in engagement (a mean score of 6), their ADS would be 4, indicating that Liz is perceiving less group engagement than her group is perceiving by 4. Tania is in another group. If Tania and her group receive an ADS of 0, that would indicate that Tania and her group are highly congruent, and that they are more

congruent than Liz and her group on this dimension. Thus, the ADS captures the similarity between a group member and her group on a particular dimension.

In the current study, difference scores were computed for each group member by measuring the difference between the individual and the group on two domains of interest: Perceptions of Group Climate (specifically, the sub-domains of Engagement, Avoidance, and Conflict) and Level of Intimate Behaviors enacted during sessions.

The use of difference scores: Means versus correlations. Funder (1997) goes on to state that there are two fundamentally different ways of measuring self-other congruence between a target and others (or, in the current study, the “actor” and the “partner”). One way is to compare overall mean scores, and the other is to compute correlations between the entities. The use of correlations in time-series analyses (the current study) would mean a loss of valuable information about the intercept and thus the direction of any observed differences over time, while the use of means retains information about both intercept and slope over time (Edwards, 1993; Funder, 1997). Therefore the current study compared means, rather than correlations, gathered from the actor (the target), the partner (the other group members of the target) and the difference between the means for actor and partner.

The problem of interdependence. Data from small groups are inherently interdependent. In groups, the target individual is also a part of the group, therefore it is crucial to utilize methods of analysis that do not confound actor data with data from the rest of the group members. The researcher also needs an analytic approach that meaningfully captures the relational aspects of group phenomena (e.g. the “groupiness” of the group). The APIM (Kashy & Kenny, 2000) is a recently developed model that

allows researchers to measure group effects by accounting for the non-independence of data from small groups (Kashy & Kenny, 2000).

While the APIM (Kashy & Kenny, 2000) has been widely used in dyadic research, only one published study has used the APIM to examine the group's effect on individual group member behavior (Bonito, DeCamp, Coffman, & Fleming, 2006). Specifically, Bonito and colleagues examined the group's effect on the amount of participation of each individual group member, and found that the group's mean level of interpersonal control (i.e., "the ability to influence what is being talked about and by whom during discussion" p. 18), and an individual group member's level of interpersonal control, influenced an individual's amount of participation in the group. However, this study did not examine the effect of congruence between individual group members and their respective groups in the use of interpersonal control, nor did it look at overall outcomes for individual participants.

Why measure intimate behaviors, perceptions of group climate, and PTSD symptoms in this sample? Given that no known research currently exists examining the relationship between fit and client symptom change in psychotherapy groups, the current study seeks to add to the literature on group therapy by attempting to measure the impact of fit between a group member and her group on both behavioral and perceptual measures. Specifically, the present study examined fit on the dimensions of 1) intimate behaviors enacted during group sessions and 2) group member perceptions of group climate. Because "the benefits of clinical groups are broadly conceptualized as the fostering of intimacy skills by which group members learn about themselves, others, and their interpersonal relationships," intimate behaviors would appear to be an essential

variable in group therapy across treatment types, populations, and settings (Shadish, 1984, p. 205). Furthermore, trauma experiences can disrupt one's ability to effectively engage in interpersonal relationships (Briere, 1987; Ford et al., 2004; Gerrity & Peterson, 2009; Marvasti, 2004). Therefore, examining intimate behaviors in trauma treatment groups in particular may be important to understanding outcomes for this population. Additionally, every group, therapeutic or not, has a group climate (Mackenzie, 1983). Because group climate has been linked with group member outcomes in therapy (Kivlighan, Coleman, & Anderson, 2000) gauging a group member's perception of the group and how this compares with the other members of the group may be instructive. Furthermore, group climate might be of particular salience given a therapy group occurring within the context of a prison.

Lastly, the present researcher extends the concept of gender responsiveness to research design. For instance, rather than using all or mostly White, male samples and then attempt to generalize and adapt study results to "alternative" populations (e.g. women, including women of color), the current study seeks to test a basic empirical question (how does the *group* as a context have an effect on the *individual*) in a new domain (group therapy) using sophisticated tools (the APIM and HLM) with a sample of women, who, despite their centrality to research questions about group dynamics and trauma treatment, have been historically ignored by researchers.

Therefore, the current study builds on the nascent findings of Paquin et al. (2011) concerning congruence in therapy groups. In their study, the authors found that incongruence in terms of intimate behaviors enacted during group sessions was significantly related to session attendance. Using a session-level analysis ($n = 575$) the

researchers found that being an outlier in a session from one of five interpersonal growth groups—specifically the group member who had the highest or the lowest level of intimate behavior in a session—increased the likelihood that that group member would not attend group the following session. Importantly, a group member’s *absolute number* of intimate behaviors in the previous session did not predict whether that member would be present in the following session. For example, Tania may have shared a lot last week, but so did everyone else. Given this scenario, the fact that Tania shared is not enough to predict whether or not she will come back next week. In another group, however, Liz shared a lot, but no one else did. In this scenario, we can predict that Liz will likely not return the following session. This finding suggests that congruence—or a lack thereof—is a risk factor for group member absence. Beyond predicting future absence from sessions, the study did not examine how this outlier status might be related to how (un)successful the group experience was overall for individual group members, nor did it examine the variable of group climate. Therefore, questions remain, including whether congruence is related to treatment outcomes.

Chapter 3: Statement of the Problem

Group therapy has been shown to be an effective treatment for many presenting problems, across settings and populations (Cory & Cryns, 1991; de Jong & Gorey, 1996; Fettes & Peters, 1992; Reeker, Ensing, & Elliott, 1997; Kivlighan et al., 2009). Furthermore, the “experience of clinical practitioners and trauma survivors over the past 50 years or more indicates that many of the potentially therapeutic factors identified with group therapy...are applicable to traumatic stress disorders” (Ford et al., 2009, p. 415). Specifically, the benefits of group versus individual treatment for survivors of childhood sexual assault (CSA) have been lauded by practitioners for decades, and group therapy is presently viewed as the modality of choice for this population (Gerrity & Peterson, 2004). However, despite years of group psychotherapy research, little is understood concerning the underlying mechanisms of change involved in group therapy, including why treatment works for some and not others (Kivlighan et al., 2000; Kivlighan et al., 2009). For example, decades of research related to therapeutic factors (such as group cohesion and self-disclosure) have either failed to connect these factors with treatment outcomes, have failed to adequately address group level phenomena, or both (Kivlighan et al., 2009).

Going beyond Yalom’s conception of group cohesion as a singular therapeutic factor, *group climate* has been conceptualized as capturing the phenomenon of group cohesion, and more (Kivlighan & Holmes, 2004). For instance, the GCQ-S (Mackenzie, 1987) is the most widely used measure of group climate in group therapy research. This measure has operationalized group climate as being a mixture of group engagement, avoidance, and conflict. Specifically, it has been shown that groups high in engagement

and low in avoidance are going to be more therapeutic (i.e., facilitate better client outcomes), while the role of conflict in a group remains uncertain (Kivlighan et al., 2009). Moreover, therapeutic factors such as self-disclosure can be more broadly conceptualized as falling under the umbrella of *intimate behaviors*, which include interpersonal behaviors that occur during group sessions such as asking other members about themselves, expressing true thoughts or feelings, and/or attempting to describe what is happening between other members of the group (Bloch & Crouch, 1985; Shadish, 1983).

Therefore, using a time-series series design, the current study examined the relationship between an individual group member's fit with her group on two dimensions and whether these dimensions were related to PTSD symptom change: perceptions of group climate and in-session intimate behaviors. The following were the hypothesized relationships between the individual's (or "actor's") perception of group climate and her level of intimate behaviors, and how these both relate to that individual's outcome.

"Actor" Hypotheses

1a. Engagement. There will be a positive linear relationship between individuals' perceptions of engagement and their reported pre to post PTSD change.

1b. Avoidance. There will be a negative linear relationship between individuals' perceptions of avoidance and their reported pre to post PTSD change.

1c. Conflict. As an independent variable, conflict in group therapy can be related to both positive and negative outcomes. Therefore, it is difficult to make an *a priori* hypothesis about this relationship. A more general research question about what the

relationship looks like between perceptions of conflict in a group over time and an individual's outcome is appropriate.

1d. Intimate behaviors. There will be a positive linear relationship between individuals' level of intimate behaviors and their reported pre to post PTSD change.

“Partner” Hypotheses

The second set of hypotheses relate to an individual's outcome as a function of *the other members in his or her group*. However, in order to test for group effects on the individual, problems presented by small group data must first be attended to. Data collected from small groups violates the assumption that scores are independent from one another. Data independence is violated in small group research because one *would* expect scores from one participant to be more similar to another group member than if the sample was drawn from a participant in a separate group. Models such as the APIM (Kashy & Kenny, 2000) account for this interdependence and allow researchers to model both actor (in the case of the present study, the individual group member) and partner (group) effects. Because group-level phenomena have been so poorly accounted for in the group therapy literature, developing and testing “partner” (group) hypotheses is key (Kivlighan et al., in press). Further, because the current study intends to compare the response patterns of the individual to her group, establishing both individual and group effects are important preliminary steps. Therefore, the following hypotheses were tested:

2a. Engagement. There will be a positive linear relationship between the perceptions of engagement of the other group members (partners) and the reported pre to post PTSD change of the target group members (actors).

2b. Avoidance. There will be a negative linear relationship between partners' perceptions of avoidance and the reported pre to post PTSD change of the target group members (actors).

2c. Conflict. See hypothesis 1c.

2d. Intimate behaviors. There will be a positive linear relationship between partners' level of intimate behaviors and the reported pre to post PTSD change of the target group members (actors).

Congruence Hypotheses

The concept of fit, or congruence between a group member and her group might help shed some light on the mechanisms of change involved in group therapy. While a similar construct, convergence, has been examined in dyadic therapy research (Al-Darmaki & Kivlighan, 1993; Borghi, 1968; Gulas, 1974; Kivlighan & Gayle, 2000; Pepinsky & Karst, 1964; Sandler, 1975) only one study in the group therapy literature investigated a concept approximating congruence (Flowers, 1987). Fit has been extensively studied in the domains of social, vocational, and industrial/organizational (I/O) psychology (Hoffman & Woehr, 2006; Spokane, Meir, & Catalano, 2000; Verquer, Beehr, and Wagner, 2003) and the concept of person-group (P-G) fit is particularly relevant (Adkins et al., 1996; Judge & Ferris, 1992; Kristof-Brown et al., 2005; Kristof-Brown & Stevens, 2001; Werbel & Gilliland, 1999). Specifically, a higher degree of P-G fit has been shown to be related to both individual level and group-level positive outcomes. The following hypotheses related to how congruence on the dimensions of group climate and intimate behaviors in therapy groups might relate to individual participant outcomes.

3a. Fit: Group climate. There will be a positive linear relationship between individuals' fit with their groups on perceptions of group climate and their report of pre to post PTSD change.

3b. Fit: Intimate behaviors. There will be a positive linear relationship between individuals' fit with their groups on level of intimate behaviors and their report of pre to post PTSD change.

3c. Fit: Group climate over time. Fit between individuals' perception of group climate and the groups' perception of group climate will increase over time.

3d. Fit: Group climate over time and PTSD change. There will be a positive linear relationship between the slope increase for individuals' level of fit on perceptions of group climate and their report of pre to post PTSD change.

3e. Fit: Intimate behaviors over time and PTSD change. There will be a positive linear relationship between the slope increase for individuals' level of fit on intimate behaviors and their report of pre to post PTSD change.

Chapter 4: Method

Participants

Groups. Six (n=6) groups were included in this study with a modal number of 12 participants in each group (13 participants in group one, 11 participants in group two, 12 participants in group three, 12 participants in group four, 13 participants in group five, and 12 participants in the sixth group). The current study used data collected by the mental health services division of a Midwestern women's state correctional facility. Their data collection is aimed at evaluating program effectiveness of a trauma treatment currently offered by the facility. A portion of these data were completely de-identified and made available to this researcher for the current study. The group treatment is based on the Trauma Recovery and Empowerment Model (TREM), a manualized treatment protocol (Fallot & Harris, 2002; Harris, 1998). The TREM was developed primarily to treat adult patients with co-morbid substance abuse and trauma disorders. The predominant interventions involved in TREM are cognitive restructuring, skills training, psychoeducation, and peer support (Fallot & Harris, 2002). At this facility, groups are offered on an ongoing basis, throughout the year. TREM groups meet twice weekly, for 75 minutes, for a total of 22 sessions over the course of 11 weeks (as opposed to 24 sessions in the original protocol). TREM is designed to be flexible in its application and its creators encourage agencies to augment session length and number to meet the needs of the treatment setting and population (Fallot & Harris, 2002).

Group members. Group members included women participating in TREM groups beginning in summer of 2009 and ending in early spring of 2010 (n = 73 individuals). Participants were given the option of participating in a TREM group if they

reported a history of trauma or met criteria for PTSD at the time of the intake interview (Drogosz, personal communication, June 9, 2009). While some mental health services are not optional for women at this correctional facility (e.g., required compliance with certain medications) participation in the TREM groups was completely voluntary and optional (Drogosz, personal communication, June 9, 2009).

Demographic data. Demographic and diagnostic data for women participating in the current study were obtained from the mental health records at the correctional facility. These data were completely de-identified by the institution, given a unique participant identifier linking the person's demographic information with her study data, and then made available to the author of this study in the form of an excel spreadsheet. Group members in the current sample ranged in age from 21 to 58, with an average age of 38.26 ($SD = 8.17$). All group members were women; at the time of participation in the group, all were incarcerated at the same facility. Twenty-five were African American, 45 were White, and three were Latina. While educational level of participants was unknown, the group leader estimates that approximately 98% of group members were literate and able to complete the measures on their own; the average reading level was estimated to be at the fourth grade level.

Clinical data. Participants were described by the group leader as having experienced at least one interpersonal trauma in their lives, such as child abuse or domestic violence (Drogosz, personal communication, May, 2010). The majority of the participants experienced complex trauma involving multiple events from childhood through adulthood (Drogosz, personal communication, May, 2010). Clinical data that were provided to this researcher included only the primary diagnosis for each participant

as noted in her mental health record. Primary mental health diagnoses included the following: Adjustment Disorder (n=4), ADHD (n=4), Anxiety Disorder NOS (n=2), Bipolar Disorder (n=20), Depression Disorder Not Otherwise Specified (n=11), Dysthymic Disorder(n=2), Generalized Anxiety Disorder (n=2), Major Depressive Disorder (n=4), Major Depressive Disorder - Recurrent (n=4), Mood Disorder Not Otherwise Specified (n=4), Posttraumatic Stress Disorder [PTSD] (n=9), Schizoaffective Disorder (n=4), and no diagnosis (n=5). Nearly all participants had a secondary diagnosis of Substance Use Disorder (Drogosz, personal communication, May, 2010).

Out of a possible 1,320 group member observations (73 group members, for each of the 22 sessions) there were 976 “complete” sets of observations that were included in the HLM analyses (e.g. “complete” meaning the group member may have been missing data from some sessions, but had completed both the pre and the posttest PTSD outcome measure). Specifically, the response rate for the GCQ-S and IRScl were both 74%.

Group leader. The group leader for all six groups was a White, 40-year-old female doctoral-level counseling psychologist with six years of group therapy experience and eight years of experience treating clients with chronic trauma or C-PTSD (personal communication, Drogosz, August 2010). The group leader describes her theoretical orientation toward psychotherapy as feminist and interpersonal (personal communication, Drogosz, August 2010). For two of the six groups, a master’s level counseling psychology trainee observed the groups regularly, participating minimally.

The group leader completed a 3-day intensive TREM training, which includes observer ratings of TREM treatment fidelity, peer feedback, didactic and skills training in

January of 2008. She previously worked in private practice, has presently worked in corrections for eight years, and has been using the TREM for 2.5 years.

Measures

Group member measures. Group members completed the Group Climate Questionnaire – Short form (MacKenzie, 1983) after each session. Group members also completed the PTSD Symptom Scale – Self-Report (Foa, Riggs, Dancu, & Rothbaum, 1993) after the first and last session of treatment.

Group Climate Questionnaire-Short Form (GCQ-S). The GCQ-S (MacKenzie, 1983) is a measure of group members' perceptions of the interpersonal environment that exists in the group therapy session, and is a shortened version of the Group Climate Questionnaire (MacKenzie, 1981). The GCQ-S consists of twelve, participant-rated items on a 7-point Likert scale, ranging from 1 (not at all) to 7 (extremely). MacKenzie (1983) found that the twelve items on the GCQ-S comprise three scales: engaged (the “working atmosphere;” the importance of the group to the members, sense of closeness, etc.), avoiding (the extent to which group members are avoiding dealing with their own problems and other group members), and conflict (interpersonal conflict and distrust). An instrument development study on the GCQ-S (MacKenzie, 1983) found that the interscale correlation between avoiding and engaged is $-.44$, the interscale correlation between conflict and engaged is $-.18$, and the interscale correlation between conflict and avoiding is $.30$.

The engaged scale includes items that “reflect the importance of the group for the members and a sense of closeness between them” (Mackenzie, 1983, p. 165), which is related to cohesion within the group. This scale also included an item reflecting

“Rogerian dimensions” (MacKenzie, 1983, p. 165), specifically the extent to which the group members like and care about each other. Self-disclosure, “cognitive understanding of the meaning of behavior” (MacKenzie, 1983, p. 165), and “challenge and confrontation [among group members] to promote interpersonal learning” (MacKenzie, 1983, p. 165) are also assessed through this scale.

The avoidance scale centers “on the idea of avoidance of responsibility by the members for their own change process” (MacKenzie, 1983, pp. 165-166). As such, it contains items that assess “avoidance of problems...dependence on the leader...high adherence to group expectations...[and] interpersonal distance” (MacKenzie, 1983, p. 166). The conflict scale “deals with interpersonal conflict and distrust” (MacKenzie, 1983, p. 166) among group members.

The GCQ-S has been used in previous research to examining the relationship between group leadership and group climate and outcomes (e.g., Kivlighan & Tarrant, 2001; Ogrodniczuk & Piper, 2003). It takes approximately five minutes to complete, and was completed by the group members following each session. A copy of the GCQ-S is included as Appendix A. The GCQ-S was administered to group members following each session, in order to assess group member differences in their perception of the group’s climate, and whether these perceptions of group climate change over time. Data obtained from individual group members on the GCQ-S will also be aggregated by group, to obtain an overall measure of perceived group climate for each group. Therefore, comparisons can be made between an individual group member, and the rest of the group.

PTSD Symptom Scale-Self Report (PSS-SR). The PTSD Symptom Scale-Self Report (PSS-SR) contains seventeen items describing symptoms associated with

posttraumatic stress disorder. Three subscales are included in the measure: re-experiencing, avoidance, and arousal. Items include questions about intrusive thoughts, sleep disturbances, hyperarousal and hypervigilance (Foa, Riggs, Dancu, & Rothbaum, 1993). Participants are asked to rate how often the symptom has occurred during the past two weeks on a scale where 0 = not at all or only one time, 1 = once per week or less/once in awhile, 2 = two to four times per week/half the time, and 3 = five or more times per week/almost always. A copy of the PSS-SR may be found in Appendix B. Responses to each item are summed to produce a total score. In an instrument development study, the PSS-SR demonstrated high test-retest reliability (the test-retest reliability of the overall severity score of the PSS-SR was .74) and high concurrent validity with other measures of PTSD such as the Structured Clinical Interview for DSM Disorders (SCID) (Foa, Riggs, Dancu, & Rothbaum, 1993). In the present study, group participants are asked to complete the measure twice: during the first and last session of treatment.

Group leader measure. The group leader noted the presence or absence of specific group member intimate behaviors enacted during each session, for each group member, after each session, using the Interpersonal Relations Scale Checklist (IRScI) (Shadish, 1984).

Interpersonal Relations Scale Checklist (IRScI). The IRScI is a 20-item, observer-rated behavioral checklist developed by Shadish (1984) to assess the construct of intimacy (Appendix C). Shadish defines intimacy as “increased awareness of and ability to deal with emotional, cognitive, and behavioral functioning of the self (intrapersonal intimacy) and of others and the relationship of self to others (interpersonal

intimacy)” (Shadish, 1984, p. 205). The items on the checklist reflect behaviors such as discussing self and relationship to others, requesting interpersonal feedback, expressing positive feelings, accepting/liking self, communicating directly and effectively with others, taking risks by revealing feelings, expressing change of attitude, expressing closeness to others, expressing negative feelings, discussing others’ feelings, and understanding what happens between others (Shadish, 1984). Following the session, the group leader checks the intimate behaviors that each individual group member engaged in during each session. A total score is obtained by adding the number of items checked, representing the number of different intimate behaviors a group member engages in during a session. Scores for each individual, during each session, can range from 0 to 20.

Shadish (1984, 1986) authored several studies on the development of the items pool and determined the concurrent and discriminant validity of the checklist. He found IRScl ratings to be positively related to group outcomes. Inter-rater reliability studies conducted with untrained raters found reliabilities ranging from .85 to .99. Kivlighan, Jauquet, Hardie, Francis, and Hershberger (1993) examined the reliability of different numbers of judges using the IRScl. They found that the reliability for one judge was almost as good as the reliability for two or three judges (.88, .91 and .93, respectively). Given these equivalent reliabilities, it is appropriate that one judge (the group therapist) make the IRScl ratings.

Procedure

The design for the current study was a correlational, time-series analysis. This design was chosen because the current study represented a first attempt at determining whether congruence between a group member and her group has any relationship to

treatment outcomes. Groups met twice weekly, for 75 minutes each session, for 22 sessions. Participants were asked to complete the PSS-SR once at the beginning of treatment and again during the last session. After every session, each participant was also asked to complete the GCQ-S and the group therapist was asked to complete the IRScl. A group member's congruence with her group on the GCQ-S and the IRScl were the independent variables, and change in PTSD symptomatology (PSS-SR) was the outcome variable.

Chapter 5: Data Analysis

Group Climate Data

Reliability of the GCQ-S scores was assessed with Chronbach's alphas for inter-item reliability for the engaged, avoiding, and conflict scales were examined. The alphas for the engaged, avoiding, and conflict scales were .86, .92 and .71, respectively

Mean scores for each subscale of the GCQ-S (engaged, avoiding, and conflict) for each member, for each session were calculated. These mean scores were then aggregated by group for each session to provide a mean score for engaged, avoiding, and conflict for each session. In order to measure the impact of the group on a particular individual, the group mean scores for engaged, avoiding, and conflict for each session were calculated without including the target individual's scores in the calculation. In other words, the group score for engaged, avoiding, and conflict is the mean of the other group members excluding the target individual.

Further, each group member has a different group-engaged, group-avoiding, and group-conflict score for each session because the identities of the other group members (and thus, their scores used to compute the group mean) differed for each individual. These mean scores were used in the subsequent growth curve analyses. This analysis examined how individual group member outcome is related to change over time in both individual and other group member perceptions of group climate.

Intimate Behavior Data

Therapist-rated data of participant intimate behaviors during each session from the IRScl (See Appendix C) were analyzed using growth curve analyses. Individual and group scores for intimate behavior were calculated as described above for group and

individual scores for group climate. This analysis examined how individual group member outcome is related to change over time in both individual and group intimate behaviors.

PTSD Symptom Data

Out of 73 participants, fifty-one completed the PSS-SR at the beginning of treatment (typically at sessions one or two) and again at the end of treatment. Twenty-two participants completed the PSS-SR only once (two participants completed only at posttest; 20 completed only at pretest). A group member's congruence with her group on the GCQ-S and the IRScl are the independent variables, and change in PTSD symptomatology (PSS-SR) is the outcome variable.

Missing Data

One of the advantages of the multi-level approach to estimating growth curves is that these curves can be estimated on the number of sessions that a group member attends. Therefore there is no need to replace missing data at the session level (Raudenbush, Bryk, & Congdon, 2005). The group members that completed treatment attend an average of 18.68 ($SD = 1.60$) sessions. During the analysis that tested the relationship between these variables and change in PTSD symptoms, however, participants missing PSS-SR data at either pre or posttest had to be dropped from the analysis. Analyses were conducted to test for significant differences between the initial sample ($n = 73$) and the final sample of those who completed both pre and posttest measures ($n = 51$).

Treatment completer analyses. Analyses were conducted to determine whether the participants who completed the PSS-SR data at both pre and posttest (treatment

“completers”) were different from participants who did not complete the PSS-SR at both pre and posttest (treatment “non-completers”) in terms of their level of PTSD symptoms, perceptions of group climate, and intimate behaviors. Findings from this analysis are reported in the results section.

Measuring Congruence Using Difference Scores

To test the congruence hypotheses in the current study, a difference score was computed for each group member by subtracting each individual’s score from her group’s score for each session (keeping in mind that this group score has been calculated without including the target individual’s scores) on the three GCQ-S scales and the IRScI. This analytic approach is based on the approach used by Funder (1997).

Actor-Partner Interdependence Model (APIM)

Because the GCQ-S and IRScI data were at the session level and the PTSD data was at the person level, an adaptation of the APIM model was used (Campbell & Kashy, 2002; Kashy & Kenny, 2000; Kenny & Cook, 1999). At the session level I examined the growth, over time, in actors’ and partners’ GCQ-S and IRScI scores. The intercepts and slopes from these growth models were used as outcome variables that were predicted by change in PTSD symptoms at the group member level. As described by Kenny and his colleagues, data for individuals in groups are (a) not independent, and (b) the product of his or her previous behaviors plus those of the other group members (Bonito, DeCamp, Coffman, & Fleming, 2006). The APIM addresses the non-independence problem by nesting the member’s intimate behavior (or perceptions of group climate) within groups in a multilevel model.

Specifically, the effects of the member's and the group's behavior and perceptions on the member's outcome were examined with 12, three-level conditional models.

Growth Curve Analysis

Growth curve analysis is a form of hierarchical linear modeling that allows researchers to examine individual (or in the case of the current study, group member and group) change over time (Raudenbush & Bryk, 2002). Group sessions are nested within group members, and group members are nested within groups. In this study, participants were members of one of six therapy groups and each member could possibly attend as many as 22 group sessions. This type of nested data creates problems for traditional statistical techniques which make the assumption that data points are independent; however multilevel techniques like hierarchical linear modeling (Raudenbush, Bryk, & Congdon, 2005) are designed to handle nested data sets.

In the current study, there are three levels of data: Session, Individual, and Group level data. The session level data includes a participant's perceptions of group climate, as well as that person's level of intimate behaviors enacted for each session. The session level data also includes the group data including the GCQ-S and IRScl for all members of a particular group excluding the target group member. In this sense, a person's behaviors and perceptions and the behaviors and perceptions of the other group members are conceptualized as characteristics of the session. The individual level data (the criterion variable) included a participant's pre and post-test scores on the PTSD symptom scale (PSS-SR). There was no group level data examined in these analyses

In growth curve analysis, change over time can be represented in a three-level model, in which multiple observations over time are nested within the individual (or in

this case, individual group member or group (Raudenbush & Bryk, 2002). Twelve completely unconditional models were run to partition the variance, one for each of the four variables (three subscales on the GCQ-S and the IRScl) to test the Actor, Partner, and Actor-Partner Fit hypotheses. Next, to answer questions related to how individuals change over time with regard to their perceptions of group climate and level of intimate behaviors, a session-level model was tested. For ease of explanation, Level of Intimate Behavior is used in the following equations as an example, however analogous models were conducted predicting each of the Group Climate subscales (Engagement, Avoidance, and Conflict). The session level model (Level 1):

$$Y \text{ (Individual's Intimate Behaviors [or perceptions of group Engagement, Avoidance, or Conflict])} = \rho 0 + \rho I(\text{Session}) + \varepsilon$$

Where Y (Individual's level of Intimate Behaviors) = is a function of $\rho 0$ (the average of all participants' intimate behaviors across all sessions) + $\rho I(\text{Session})$ (which session) + ε (error).

To address questions about the relationship between the individual's perceptions and behaviors and her outcome (hypotheses 1a – 1d) the individual level variable (PTSD score) was added in the level two model:

$$\begin{aligned} \rho 0 &= \beta 00 + \beta 01 (\text{PTSD}) + R1 \\ \rho I &= \beta 10 + \beta 11 (\text{PTSD}) + R2 \end{aligned}$$

Where $\rho 0$ (individuals' level of intimate behavior [or perceptions of group Engagement, Avoidance, or Conflict]) is a function of $\beta 00$ (individuals' average level of intimate behaviors across sessions), the $\beta 01$ (PTSD) (individuals' PTSD change) and $R1$ (error). Also ρI (individuals' change in intimate behaviors across sessions) is a function of $\beta 10$

(individuals' average change in intimate behaviors across sessions), the β_{01} (PTSD) (individuals' PTSD change) and $R1$ (error).

The level three model (group level) accounts for the doubly nested nature of the session data and individual data within groups:

$$\begin{aligned}\beta_{00} &= \gamma_{000} + U_{00} \\ \beta_{01} &= \gamma_{001} + U_{01} \\ \beta_{10} &= \gamma_{010} + U_{02} \\ \beta_{30} &= \gamma_{011} + U_{03}\end{aligned}$$

Next, the following models were designed to test the hypotheses about group (partner) effects. In other words, these models were used to help answer questions about how the level of intimate behaviors and group climate perceptions *of the other members of a group* (the partner) change over time (hypotheses 2a - 2d). They are analogous to the models above; the difference is instead of predicting an individual's level of intimate behaviors (or perceptions of group Engagement, Avoidance, or Conflict), these models are predicting *the group's* level of intimate behaviors.

$$\text{Level 1: } Y (\text{Group's Intimate Behaviors}) = \rho_0 + \rho_1(\text{Session}) + \varepsilon$$

$$\begin{aligned}\text{Level 2: } \rho_1 &= \beta_{00} + \beta_{01} (\text{outcome}) + R1 \\ \rho_2 &= \beta_{10} + \beta_{11} (\text{outcome}) + R2\end{aligned}$$

$$\begin{aligned}\text{Level 3: } \beta_{00} &= \gamma_{000} + U_{00} \\ \beta_{01} &= \gamma_{001} + U_{01} \\ \beta_{10} &= \gamma_{010} + U_{02} \\ \beta_{30} &= \gamma_{011} + U_{03}\end{aligned}$$

Additionally, to address questions concerning how congruence between a group member and her group (*actor-partner "fit"*) changes over time, three additional models were tested which used algebraic difference scores computed from session (GCQ-S and IRScl scores), individual (PSS-SR scores), and group level data (hypotheses 3a – 3e).

Difference scores were used as an alternative to the proposed similarity profile correlations (PSCs) for several reasons. One, while PSCs can illustrate the pattern of fit between actor and partner over time, PSCs fail to capture the intercept on a given dimension. In other words, a PSC can tell the researcher that an individual's mean is consistently X amount away from the group's mean, but directionality over time cannot be inferred (e.g. the individual is consistently higher or lower than the group). Therefore, important information is lost in the use of PSCs in the current study. Difference scores (Funder, 1997) allows the researcher to determine the difference between the actor and the group in terms of both slope and intercept. In other words, how near or far the individual is to the group over time, and in what direction.

Chapter 5: Results

Treatment Completer Analyses

Analyses were run to determine whether the 51 treatment “Completers” (those who completed both pre and post treatment PTSD measures) were significantly different from the other 22 Non-completers. In other words, this researcher examined whether the treatment Non-completers were scoring significantly differently on the measures from the Completers.

Analyses for Completers versus Non-completers. Descriptive statistics indicated that Completers were evenly distributed across groups. Analyses were conducted to determine whether the Completers scored significantly different from the Non-completers on the variables of interest. A new variable was created and assigned a value of 1 (Completers) or 0 (Non-completers) and entered into a growth curve analysis. Results indicated that Completers attended approximately five sessions more than Non-completers (19 versus 14 sessions, respectively, out of a possible 22) ($\gamma_{110} = 7.099$, $SE = 0.742$, T-ratio ($df = (1,5) = 0.9.557$, $p = 0.000$) and that participants who attended more sessions were more likely to comply with the research protocol (i.e. fill out both pre and post PTSD measures).

Actor effects for Completers. Results indicated that an individual group member (an actor) who completed both the pre and post treatment assessments was not significantly different from a Non-completer in terms of her level of intimate behaviors ($\gamma_{100} = .979$, t-ratio = 1.413, $p > .05$), nor in terms of how she perceived the group’s climate in terms of its level of engagement (.074, t-ratio = .426, $p > .05$), avoidance (-.256, t-ratio = -1.01, $p > .05$), and conflict (-0.132, t-ratio = .162, $p > .05$). Furthermore, a

t test revealed that level of PTSD symptoms reported at pretest was not related to whether a group member completed both pre and posttests on the outcome measure ($\beta = -.011$, $t(1, 5)$, $p = .991$). In other words, a Non-completer was not reporting significantly different levels of PTSD symptoms at the beginning of treatment from Completers.

Partner effects for Completers. Additionally, growth curve analysis was used to test for partner (group) effects for Completers. In other words, were the other group members for those who completed both PTSD pre and post assessments different from the group members for those who completed only one assessment on the intimacy and group climate variables. Significant partner effects were found for two variables: Engagement and Conflict. For Completers, the other group members saw the group as more engaged, than the other group members of non-Completers (5.398, t -ratio = 45.65, $p < .05$). Furthermore, the group members in groups with Completers began treatment perceiving a higher level of group engagement and their perception of group engagement gradually increased over time (.281, t -ratio = 2.880, $p < .05$). The group members of Non-completers appear to start treatment perceiving a lower level of group engagement and have a steeper increase in the amount of perceived engagement.

The group effect for Conflict was the opposite of the group effect for Engaged. For Completer participants, the other group members in their groups saw the group as less conflictual than the other group members of the Non-completers at the beginning of treatment. In other words, Completers were in groups where the other group members start treatment with a lower intercept (1.982, t -ratio = 28.020, $p < .05$) and have a sharp decrease in slope in terms of their perceptions of group conflict (-0.150, t -ratio = -4.063, $p < .05$). It appears that Non-completers are in groups where the other group members

begin treatment with a higher intercept and a more gradual downward slope (-0.026 , $t = \text{ratio} = -2.387$, $p > .05$).

In sum, Completers and Non-completers were significantly different in terms of number of sessions they attended, which can be considered a given as non-Completers did not complete treatment. With the exception of the partner effects found for Engagement and Conflict, no other significant differences between the two groups were observed. Importantly, no pre-treatment differences in level of PTSD symptoms were found. Therefore, the low completion rate of both pre and post treatment measures may not have biased study results.

Missing Data

Cases with missing PSS-SR scores (the criterion variable) had to be dropped from the analyses. The final sample consisted of 51 participants (twenty cases had missing post-test data and two cases had missing pretest data, therefore 22 cases had to be removed prior to performing the HLM analysis). Mean scores on the PTSD measure at pretest were 39.59 ($SD = 12.66$) with a range of four to 66 (out of a possible 66 on the measure). Mean scores for PTSD symptoms at posttest were 20.59 ($SD = 12.45$) with a range from three to 61. The mean level of change between pre and post was 19 ($SD = 14.61$) with a range of -13 to 53. A t-test revealed that the change in PTSD scores from pre to posttest was significant $t(50) = 9.29$, $p < .05$.

Hierarchical Linear Modeling - Completely Unconditional Models

In order to partition the variance, 12 completely unconditional, three-level hierarchical linear models were run using HLM 6.0 (Raudenbush, Bryk, & Congdon, 2005). One model was run for each of the four variables (Engagement, Avoidance,

Conflict, and Intimate Behaviors) for the Actor (individual group member), the Partner (group), and Fit (difference between actor and partner) for a total of 12 unconditional models.

Intimate behaviors: Actor. For actor-IRScl, sigma-squared was 10.05, tau 1(pi) was 1.74, and tau 2(beta) was .92, indicating a total variance of 12.72. Therefore 79% of the variance in IRScl scores for the Actors' IRScl was between sessions, 14% of the variance was between people and 7% of the variance was between groups. The between group variance was significantly different from zero ($p < .05$). The γ coefficient (5.303 SE = 0.446, $t = 11.867$, $p < .001$) from this completely unconditional model indicates that on average group members (all of the actors) engaged in approximately five intimate behaviors per session and this was significantly different from zero.

Engaged: Actor. For actor-engaged, sigma-squared was .54, tau 1(pi) was .37, and tau 2(beta) was .00, indicating a total variance of .91. Therefore 60% of the variance in Engagement scores was between sessions, 40% of the variance was between people and none of the variance was between groups. The between group variance was not significantly different from zero ($p > .05$) therefore it allowed the researcher to fix the group effect. In other words, the researcher did not have to take the group effect into account during subsequent analysis. The γ coefficient (5.65, SE = 0.088, $t = 63.92$, $p < .001$) is a rating that corresponds to a mid-point between a "great deal" and "extremely" on the GCQ-S 7-point Likert scale.

Avoidance: Actor. For actor-avoidance, sigma-squared was .88, tau 1(pi) was .97, and tau 2(beta) was .00, indicating a total variance of 1.84. Therefore 48% of the variance in Avoidance scores was between sessions, 52% of the variance was between people and

none of the variance was between groups. The between group variance was not significantly different from zero ($p > .05$) therefore it allowed the researcher to fix the group effect. The γ coefficient (3.68, SE = .141, $t = 26.07$, $p < .001$) is a rating that corresponds to the mid-point between “moderately” and “quite a bit” on the GCQ-S 7-point Likert scale.

Conflict: Actor. For actor-conflict, sigma-squared was .67, tau 1(pi) was .38, and tau 2(beta) was .00, indicating a total variance of 1.05. Therefore 64% of the variance in Conflict scores was between sessions, 36% of the variance was between people and none of the variance was between groups. The between group variance was not significantly different from zero ($p > .05$) therefore the researcher did not have to take the group effect into account. The γ coefficient (1.83, SE = .089, $t = 20.417$, $p < .001$) is a rating that corresponds to a mid-point between “not at all” and “a little bit” on the GCQ-S 7-point Likert scale.

Partner models. In order to test hypotheses about the partner (the group) four partner models were run: one for each of the group climate subscales (Engagement, Avoidance, and Conflict) and one for IRScl scores (level of intimate behaviors). Again, the model of intimate behaviors is used as an example (analogous models were run for Engagement, Avoidance, and Conflict). Level 1 modeled session-level (i.e., within individual) variance of each variable (i.e., intimate behaviors) for each of the 22 group sessions.

Intimate behaviors: Partner. For partner-IRScl, sigma-squared was 5.92, tau 1(pi) was .00, and tau 2(beta) was 1.09, indicating a total variance of 7.02. Therefore 84% of the variance in IRScl scores was between sessions, none of the variance was

between people and 16% of the variance was between groups. The variance between groups was significant ($p < .05$). The γ coefficient (5.25, SE = 0.434, $t = 12.097$, $p < .001$) from this completely unconditional model indicates that on average the group members (all of the partners) engaged in approximately five intimate behaviors per session which was significantly different from zero.

Engaged: Partner. For partner-engaged, sigma-squared was .18, tau 1(pi) was .00, and tau 2(beta) was .00, indicating a total variance of .18. Therefore 97% of the variance in Engagement scores was between sessions, none of the variance was between people and 3% of the variance was between groups. The variance between groups was significant ($p < .05$). The γ coefficient (5.681, SE = .035, $t = 159.144$, $p < .001$) is a rating which corresponds to the midpoint between between “a great deal” and “extremely” on the GCQ-S 7-point Likert scale.

Avoidance: Partner. For partner-avoidance, sigma-squared was .14, tau 1(pi) was .01, and tau 2(beta) was .04, indicating a total variance of .19. Therefore 73% of the variance in Avoidance scores was between sessions, 5% of the variance was between people and 22% of the variance was between groups. The variance between groups was significant ($p < .05$). The γ coefficient (3.704, SE = .086, $t = 42.697$, $p < .001$) is a rating which corresponds to the midpoint between “moderately” and “quite a bit” on the GCQ-S 7-point Likert scale.

Conflict: Partner. For partner-conflict, sigma-squared was .16, tau 1(pi) was .00, and tau 2(beta) was .02, indicating a total variance of .17. Therefore 90% of the variance in Conflict scores was between sessions, none of the variance was between people and 10% of the variance was between groups. The variance between groups was significant (p

< .05). The γ coefficient (1.831, SE = .054, $t = 33.401$, $p < .001$) is a rating that corresponds to a mid-point between “not at all” and “a little bit” on the GCQ-S 7-point Likert scale.

Fit (or “difference”) models. The last unconditional models conducted were four fit models: one for each of the group climate subscales (Engagement, Avoidance, and Conflict) and one for IRScI scores (level of intimate behaviors) in order to partition the variance for the fit between actor and partner (individual group member and group). Level 1 modeled session-level (i.e., within individual) variance of each variable (i.e., intimate behaviors) for each of the 22 group sessions.

Intimate behaviors: Fit. For fit-IRScI, sigma-squared was 4.97, tau 1(pi) was 2.11, and tau 2(beta) was .00, indicating a total variance of 7.08. Therefore 70% of the variance in IRScI scores was between sessions, 30% of the variance was between people and none of the variance was between groups. The between group variance was not significantly different from zero ($p > .05$) therefore the researcher did not have to take the group effect into account. The γ coefficient (.067, SE = 0.216, $t = .312$, $p > .05$) from this completely unconditional model indicates that on average the difference between the amount of intimate behaviors a group member engaged in and the amount of behaviors her group engaged in per session was less than one, and not significantly different from zero.

Engaged: Fit. For fit-engaged, sigma-squared was .43, tau 1(pi) was .46, and tau 2(beta) was .00, indicating a total variance of .89. Therefore 48% of the variance in Engagement scores was between sessions, 52% of the variance was between people and none of the variance was between groups. The between group variance was not

significantly different from zero ($p > .05$) therefore the researcher did not have to take the group effect into account. The γ coefficient (-0.019 , $SE = 0.097$, $t = -0.200$, $p > .05$) from this completely unconditional model indicates that on average the difference between the group member and her group on perceived group engagement per session was less than one and not significantly different from zero.

Avoidance: Fit. For fit-avoidance, sigma-squared was .95, tau 1(pi) was 1.16, and tau 2(beta) was .00, indicating a total variance of 2.135. Therefore 44% of the variance in Avoidance scores was between sessions, 56% of the variance was between people and none of the variance was between groups. The between group variance was not significantly different from zero ($p > .05$) therefore the researcher did not have to take the group effect into account. The γ coefficient (-0.032 , $SE = 0.155$, $t = -0.210$, $p > .05$) from this completely unconditional model indicates that on average the difference between the group member and her group on perceived group avoidance per session was less than one and not significantly different from zero.

Conflict: Fit. For fit-conflict, sigma-squared was .63, tau 1(pi) was .46, and tau 2(beta) was .00, indicating a total variance of 1.098. Therefore 58% of the variance in Conflict scores was between sessions, 42% of the variance was between people and none of the variance was between groups. The between group variance was not significantly different from zero ($p > .05$) therefore the researcher did not have to take the group effect into account. The γ coefficient (-0.001 , $SE = .098$, $t = -0.012$, $p > .05$) from this completely unconditional model indicates that on average the difference between the group member and her group on perceived group conflict per session was less than one and not significantly different from zero.

Gamma coefficients, standard errors, and t-ratios for all of the growth curve analyses are provided in Tables 1 and 2.

Hierarchical Linear Modeling - Change Models

The purpose of the current study was to examine whether a group member's fit with her group in terms of her intimate behaviors during group sessions and how she perceived the group's climate had any relationship to reported PTSD symptom at posttest. In sum, the current study sought to examine the relationship, over time, between (1) a group member's own behaviors and perceptions (the Actor) (2), the behaviors and perceptions of the other group members (the Partner), and (3) how closely the Actor and the Partner resembled each other on these dimensions. Therefore, twelve models were run to test three sets of hypotheses. Predictor variables Session (time) and PTSD Change were added to the unconditional models; one model was run for each of the four variables (Engagement, Avoidance, Conflict, and Intimate Behaviors) for the Actor (individual group member), the Partner (group), and Fit (difference between actor and partner) for a total of 12 models. Descriptive statistics and results from each model (with its associated hypothesis) follow.

Change in PTSD: Actor models.

Actor descriptives. The average number of intimate behaviors for an individual group member in a session was 5.35 ($SD = 3.58$), with a range of zero to sixteen (out of a possible zero to twenty). This suggests that the group members were engaging in a low to moderate number of intimate behaviors during the group sessions. This average is less than the intimate behaviors reported among a sample of university students participating in interpersonal growth groups (Paquin, et al., 2011), similar to the levels in a study of a

similar population of interpersonal process groups at sessions five through fifteen (Kivlighan, et al., 1993), and lower than that observed in the same study after fifteen sessions (mean of 7.11; $SD = 5.67$). Unlike both studies (Kivlighan et al., 1993; Paquin et al., 2011) the level of intimate behaviors observed in the current study did not increase over time.

The average level of perceived engagement for a group member in a session was 5.65 ($SD = .96$), with a range of 2.20 to seven (on a likert scale from one to seven). The average level of perceived avoidance for a group member in a session was 3.70 ($SD = 1.36$), with a range of one to seven. The average level of perceived conflict for a group member in a session was 1.85 ($SD = 1.03$), with a range of one to 6.50. This suggests that the sample perceived a moderate to high amount of group engagement (that increased over time), a low to moderate level of group avoidance (that decreased over time), and a low level of group conflict (that decreased over time). Previous research on group climate development within groups also has found trends toward increased engagement (e.g., Ogrodniczuk & Piper, 2003; Tasca, Balfour, Ritchie, & Bissada, 2006) and decreased avoidance (Kivlighan & Lilly, 1997; Tasca et al., 2006). While conflict has been found to remain at consistent levels in other research (Kivlighan & Lilly, 1997; Ogrodniczuk & Piper, 2003) conflict was found to decrease in the present study.

Actor hypotheses. Hypothesis 1a, that a positive linear relationship will be observed between perceived group engagement and reported PTSD symptom change from pre to posttest, was not supported. A session-level model was tested in order to predict the individual group member's level of perceived engagement (the same model also was run to predict an individual's level of perceived group avoidance, group conflict,

and level of intimate behaviors she enacted during each session). The session level model (Level 1):

$$Y (\text{Perceived Group Engagement}) = \rho_0 + \rho_1(\text{Session}) + \varepsilon$$

Where Y (Perceived Group Engagement) = is a function of ρ_0 (the average of all participants' level of perceived group engagement across all sessions) + $\rho_1(\text{Session})$ (which session) + ε (error).

To further refine the model the individual level variable (PTSD score) was added in the level two model:

$$\begin{aligned} \rho_0 &= \beta_{00} + \beta_{01} (\text{PTSD}) + R_1 \\ \rho_1 &= \beta_{10} + \beta_{11} (\text{PTSD}) + R_2 \end{aligned}$$

Where ρ_0 (individuals' level of perceived group engagement) is a function of β_{00} (individuals' average level of perceived group engagement across sessions), the β_{01} (PTSD) (individuals' PTSD change) and R_1 (error). Also ρ_1 (individuals' change in perceived group engagement across sessions) is a function of β_{10} (individuals' average change in perceived group engagement across sessions), the β_{11} (PTSD) (individuals' PTSD change) and R_2 (error).

The level three model (group level) accounts for the doubly nested nature of the session data and individual data within groups:

$$\begin{aligned} \beta_{00} &= \gamma_{000} + U_{00} \\ \beta_{01} &= \gamma_{001} + U_{01} \\ \beta_{10} &= \gamma_{010} + U_{02} \\ \beta_{11} &= \gamma_{011} + U_{03} \end{aligned}$$

Hypothesis 1a, that there will be a positive linear relationship between individuals' perceptions of group engagement and reported PTSD symptom change from pre to

posttest, was not supported ($\gamma_{010} = -0.001$, $SE = 0.006$, T-ratio ($df = (1,49) = -0.184$, $p = 0.855$). The actor's perception of engagement was found to increase over time ($\gamma_{100} = 0.050$, $SE = 0.007$, T-ratio ($df = (1,49) = 7.139$, $p < 0.05$). However, PTSD symptom change was not related to the actor's increase in perceived engagement ($\gamma_{110} = 0.000$, $SE = 0.000$, T-ratio ($df = (1,49) = 0.269$, $p = 0.789$).

Hypothesis 1b, that there will be a negative linear relationship between individuals' perceptions of avoidance and their reported pre to post PTSD change was not supported ($\gamma_{010} = -0.001$, $SE = 0.010$, T-ratio ($df = (1,49) = -0.086$, $p = 0.932$). An actor's perception of avoidance was found to decrease over time ($\gamma_{100} = -0.025$, $SE = 0.010$, T-ratio($df = (1,49) = -2.589$, $p < 0.05$). However, PTSD symptom change was not related to the actor's decrease in perceived avoidance ($\gamma_{110} = 0.001$, $SE = 0.001$, T-ratio ($df = (1,49) = 1.713$, $p = 0.093$).

There is conflicting evidence in the literature concerning the role of perceived group conflict and other group variables. In the present study, an a priori hypothesis was not stated, however a change model was examined to determine the nature of the relationship between conflict and PTSD change. Group conflict followed a similar pattern as avoidance: An actor's perception of conflict was found to decrease over time ($\gamma_{100} = -0.031$, $SE = 0.006$, T-ratio($df = (1,49) = -4.759$, $p < 0.05$). However, PTSD symptom change was not related to the actor's decrease in perceived conflict ($\gamma_{110} = -0.000$, $SE = 0.000$, T-ratio ($df = (1,49) = -0.218$, $p = 0.828$).

Lastly, hypothesis 1d, that there will be a positive linear relationship between individuals' level of intimate behaviors during group sessions and their reported pre to post PTSD change was not supported ($\gamma_{010} = .008$, $SE = 0.017$, T-ratio ($df = (1,5) = 0.466$,

$p = 0.66$). An actor's level of intimate behaviors did not change over time ($\gamma_{100} = 0.120$, $SE = 0.060$, T-ratio ($df = (1,5) = 2.004$, $p = 0.10$) and PTSD symptom change was not related to the actor's level of intimate behaviors ($\gamma_{110} = 0.000$, $SE = 0.001$, T-ratio ($df = (1,5) = 0.171$, $p = 0.872$).

Change in PTSD symptoms: Partner models.

Partner descriptives. The average number of intimate behaviors for the partner (the other group members' scores calculated without the target individual's score, averaged across groups) in a session was 5.29 ($SD = 2.65$), with a range of .2 to 13.29 (out of a possible zero to 20). This suggests that the other members of a group, across groups, were engaging in a low to moderate number of intimate behaviors during the group sessions. The average level of perceived engagement for the partner in a session was 5.68 ($SD = .43$), with a range of 4.17 to 6.57. The average level of perceived avoidance for the partner in a session was 3.71 ($SD = .44$), with a range of 2.17 to 5.15. The average level of perceived conflict for the partner in a session was 1.84 ($SD = .41$), with a range of one to 3.97. This suggests that the sample perceived a moderate to high amount of group engagement, a low to moderate level of group avoidance, and a low level of group conflict.

Partner hypotheses. The second set of hypotheses related to an individual's outcome as a function of *the other members in her group*. The following models were used to test hypotheses about group (partner) effects; namely, how the group climate perceptions of an individual's group members (Hypotheses 2a, 2b, and 2c) and the intimate behaviors of the other group members (Hypothesis 2d) relate to individuals' PTSD symptom change. They are analogous to the models above; the difference is

instead of predicting an individual's perception of group climate (or level of intimate behaviors) using that individual's data, these models attempted to predict change in PTSD symptoms for an individual using her group's (partner's) data. Four models were tested predicting perceived group Engagement (model shown), Avoidance, Conflict, and level of Intimate Behaviors:

$$\text{Level 1: } Y \text{ (Group's Perception of Group Engagement)} = \rho_0 + \rho_1(\text{Session}) + \varepsilon$$

$$\begin{aligned} \text{Level 2: } \rho_1 &= \beta_{00} + \beta_{01} \text{ (PTSD Change)} + R_1 \\ \rho_2 &= \beta_{10} + \beta_{11} \text{ (PTSD Change)} + R_2 \end{aligned}$$

$$\begin{aligned} \text{Level 3: } \beta_{00} &= \gamma_{000} + U_{00} \\ \beta_{01} &= \gamma_{001} + U_{01} \\ \beta_{10} &= \gamma_{010} + U_{02} \\ \beta_{30} &= \gamma_{011} + U_{03} \end{aligned}$$

Results indicate that like the actor, the partners (other group members) saw group engagement as increasing over time ($\gamma_{100} = 0.044$, $SE = 0.011$, T-ratio (df =(1,5)) = 4.098, $p < 0.05$). However, contrary to Hypothesis 2a, that there will be a positive linear relationship between the perceptions of engagement of the other group members (partners) and the reported pre to post PTSD change of the target group members (actors), PTSD change was not shown to be related to the group's level of perceived group engagement ($\gamma_{100} = 0.000$, $SE = 0.000$, T-ratio (df =(1,5))= .033, $p = .976$). Furthermore, PTSD change was not related to the group's increasing levels of perceived group engagement over time ($\gamma_{100} = 0.000$, $SE = 0.000$, T-ratio (df =(1,5)) = -0.400, $p = .705$).

Like the actor, the partners (other group members) saw group avoidance as decreasing over time ($\gamma_{100} = -0.023$, $SE = 0.007$, T-ratio (df =(1,5)) = -3.184, $p < 0.05$).

However, Hypothesis 2b, that there will be a negative linear relationship between partners' perceptions of avoidance and the reported pre to post PTSD change of the target group members (actors), was not supported as PTSD change was not shown to be related to the group's level of perceived group avoidance ($\gamma_{100} = 0.000$, $SE = 0.001$, T-ratio ($df = (1,5)$) = .082, $p = .938$). Furthermore, PTSD change was not related to the group's decreasing levels of perceived group engagement over time ($\gamma_{100} = -0.000$, $SE = 0.000$, T-ratio ($df = (1,5)$) = -0.116, $p = .913$).

Similarly, the actors and the partners saw conflict as decreasing over time ($\gamma_{100} = -0.029$, $SE = 0.005$, T-ratio ($df = (1,5)$) = -5.039, $p < 0.05$). However, PTSD symptom change was not related to the partners' decrease in perceived conflict ($\gamma_{110} = -0.000$, $SE = 0.000$, T-ratio ($df = (1,5)$) = 0.000, $p = 0.943$).

Lastly, Hypothesis 2d stated that there will be a positive linear relationship between partners' level of intimate behaviors and the reported pre to post PTSD change of the target group members (actors). This was not supported ($\gamma_{010} = -0.001$, $SE = 0.005$, T-ratio ($df = (1,5)$) = -0.206, $p = 0.845$). The partners' level of intimate behaviors did not change over time ($\gamma_{100} = 0.109$, $SE = 0.067$, T-ratio ($df = (1,5)$) = 1.635, $p = 0.162$) and PTSD symptom change was not related to the partner's level of intimate behaviors ($\gamma_{110} = 0.000$, $SE = 0.000$, T-ratio ($df = (1,5)$) = 0.079, $p = 0.941$).

Change in PTSD: Actor-partner fit models. The following models were designed to test the congruence (or fit) hypotheses. In other words, whether the degree of similarity between a group member (Actor) and her group (Partner) had any relationship to change in PTSD symptoms. Mean difference scores were calculated for each group member, on each dimension, at each session (Funder, 1997) and these difference scores

were included in four models. The difference scores represent how different (or similar) each group member is to her group. Difference scores were entered as the criterion and change in PTSD was entered as the predictor variable.

Actor-partner fit descriptives. Mean scores, standard deviations, and ranges were calculated for the difference between a group member and her group on the four variables. If there were no difference between a group member and her group, the mean would be 0. The mean difference between a group member and her group's level of intimate behaviors in a session was .05 ($SD = 2.67$), with a range of -13.29 to 9.14. The mean difference between a group member and her group's level of perceived engagement in a session was -0.03 ($SD = .95$), with a range of -3.17 to 2.60. The mean difference between a group member and her group's level of perceived avoidance in a session was -0.01 ($SD = 1.46$), with a range of -3.56 to 4.56. The mean difference between a group member and her group's level of perceived conflict in a session was 0.01 ($SD = 1.05$), with a range of -2.05 to 4.69. These scores indicate the high degree of similarity between a group member's average level of intimate behaviors compared with her group, and an even greater similarity between how a group member perceives the group climate (on all three subscales) compared with her group's perception.

Engagement, Avoidance, and Conflict: Actor-partner fit and PTSD change.

In order to examine Hypothesis 3a, that there is a positive linear relationship between individuals' fit with their groups on perceptions of group climate and their report of pre to post PTSD change, three separate growth curve analyses were run using difference scores (for Engagement, Avoidance, and Conflict). Again, perceptions of group Engagement is used as an example:

Level 1: Y (**Difference** between actor's perceived group Engagement and partner's perceived group Engagement) = $\rho_0 + \rho_1(\text{Session}) + \varepsilon$

$$\begin{aligned}\text{Level 2: } \rho_1 &= \beta_{00} + \beta_{01} (\text{PTSD Change}) + R_1 \\ \rho_2 &= \beta_{10} + \beta_{11} (\text{PTSD Change}) + R_2\end{aligned}$$

$$\begin{aligned}\text{Level 3: } \beta_{00} &= \gamma_{000} + U_{00} \\ \beta_{01} &= \gamma_{001} + U_{01} \\ \beta_{10} &= \gamma_{010} + U_{02} \\ \beta_{30} &= \gamma_{011} + U_{03}\end{aligned}$$

Hypothesis 3a was not supported; in other words, a positive linear relationship between individuals' fit with their groups on perceptions of group climate and their report of pre to post PTSD change was not observed. Specifically, a positive linear relationship between individuals' fit with their groups on perceptions of group engagement and their report of pre to post PTSD change was not observed ($\gamma_{010} = -0.001$, $SE = 0.007$, T-ratio ($df = (1,49)$) = -0.187 , $p = 0.853$). The fit on engagement did not change over time ($\gamma_{100} = 0.004$, $SE = 0.006$, T-ratio ($df = (1,49)$) = $.668$, $p = 0.507$) and PTSD symptom change was not related to the fit on engagement ($\gamma_{110} = 0.000$, $SE = 0.000$, T-ratio ($df = (1,49)$) = 0.484 , $p = 0.630$). The hypothesis that there would be a negative linear relationship between individuals' fit with their groups on perceptions of group avoidance and their report of pre to post PTSD change, was not observed ($\gamma_{010} = -0.000$, $SE = 0.011$, T-ratio ($df = (1,49)$) = -0.063 , $p = 0.951$). The fit on avoidance did not change over time ($\gamma_{100} = -0.000$, $SE = 0.010$, T-ratio ($df = (1,49)$) = -0.021 , $p = 0.984$) and PTSD symptom change was not related to the fit on avoidance ($\gamma_{110} = 0.001$, $SE = 0.000$, T-ratio ($df = (1,49)$) = 1.636 , $p = 0.108$). While no hypothesis was stated regarding the relationship between group conflict and PTSD symptom change, no significant relationship was observed ($\gamma_{010} = -0.000$, $SE = 0.007$, T-ratio ($df = (1,49)$) = -0.130 , $p = 0.897$). The fit on conflict did not

change over time ($\gamma_{100} = -0.001$, $SE = 0.007$, T-ratio ($df = (1,49)$) = -0.216 , $p = 0.830$) and PTSD symptom change was not related to the fit on conflict ($\gamma_{110} = 0.000$, $SE = 0.000$, T-ratio ($df = (1,49)$) = -0.172 , $p = 0.864$).

Furthermore, contrary to Hypothesis 3c, congruence in perceptions of engagement, avoidance, and conflict did not change over time. Hypothesis 3d stated that there will be a positive linear relationship between the slope increase for individuals' level of fit on perceptions of group climate and their report of pre to post PTSD change; this hypothesis was not supported (Table 2).

Intimate behaviors: Actor-partner fit and PTSD change.

In order to examine Hypothesis 3b, that the fit between an individual's level of intimate behaviors and her group's level of intimate behaviors would be related to PTSD symptom change, growth curve analysis was run using difference scores as the criterion variable and PTSD as the predictor variable:

$$\text{Level 1: } Y \text{ (Difference between Actor's Intimate Behaviors and Partner's Intimate Behaviors)} = \rho_0 + \rho_1(\text{Session}) + \varepsilon$$

$$\text{Level 2: } \rho_1 = \beta_{00} + \beta_{01} \text{ (PTSD Change)} + R_1$$

$$\rho_2 = \beta_{10} + \beta_{11} \text{ (PTSD Change)} + R_2$$

$$\text{Level 3: } \beta_{00} = \gamma_{000} + U_{00}$$

$$\beta_{01} = \gamma_{001} + U_{01}$$

$$\beta_{10} = \gamma_{010} + U_{02}$$

$$\beta_{30} = \gamma_{011} + U_{03}$$

Support for hypothesis 3b, that the fit between an individual's level of intimate behaviors and the level of intimate behaviors of her group would be related to PTSD symptom change, was not supported ($\gamma_{010} = 0.005$, $SE = 0.015$, T-ratio ($df = (1,49)$) = 0.349 , $p = 0.728$). The fit on intimate behaviors did not change over time ($\gamma_{100} = 0.008$,

SE = 0.014, T-ratio (df =(1,49)) = 0.587, $p = 0.559$) and PTSD symptom change was not related to the fit on conflict ($\gamma_{110} = 0.000$, SE = 0.001, T-ratio (df =(1,49)) = -0.052, $p = 0.959$). Hypothesis 3e, that there would be a positive linear relationship between an increasing amount of fit in intimate behaviors and reported PTSD change, was not supported.

Chapter 7: Discussion

The current study sought to examine the relationships between a group member's fit (i.e., congruence) with her group in terms of perceptions of group climate and in-session intimate behaviors, and PTSD symptoms in trauma treatment groups for incarcerated women. Given that person-group fit relates to important outcomes in the I/O psychology literature (Judge & Ferris, 1992; Spokane, Meir, & Catalano, 2000; Hoffman & Woehr, 2006), and building on Yalom's (2005) conceptualization of the "outlier" in group psychotherapy, the current study sought to examine whether fit had any relationship to reported change from pre to posttest in PTSD symptoms at the end of treatment. Specifically, in-session intimate behaviors and group member perceptions of the group's climate were measured using the IRScl and GCQ-S, respectively. PTSD symptomatology was measured using the PSS-SR, and change scores were calculated by subtracting posttest from pretest scores. Because the concept of fit is an inherently interdependent one – between a group member and the group – the APIM and HLM were used in order to account for this interdependence and to model both actor (what a group member will do based on her previous behavior) and partner (what a member will do based only on the behavior of the other group members) effects, over time. Furthermore, to test the relationship between actor-partner fit and outcomes, difference scores were used to determine whether a higher degree of fit was linked with a better PTSD outcome. Fifty-one out of the 73 group members completed both pre and post-test measures. Significant differences were observed among the partners of participants that completed both PTSD pre and posttest measures and those that did not, on the variables of group Engagement and Conflict. No other significant results were found. Significant and non-

significant findings are summarized and reported below. Study strengths, limitations, and implications for future research are also discussed.

Intimate Behaviors Over Time

The individuals in the current sample were engaging in approximately five intimate behaviors per session (with a range from 0 to 16, out of a possible 20); a moderate to low number of intimate behaviors that did not change over time.

Compared with other studies looking at intimate behaviors in interpersonal growth groups, this amount was less than what was found in one study (Paquin et al., 2011) and similar to another (Kivlighan et al., 1993). Unlike these studies, the level of intimate behaviors observed in the current study interestingly did not increase over time.

In a separate study (Miles, et al., under review) the authors used a portion of the current data set (three of the six trauma groups) combined with data from five additional interpersonal growth groups occurring on a college campus to test questions related to whether the group's (i.e., the partner's) level of intimate behaviors predicted the intimate behaviors of the individual (i.e., the actor). The authors found that while the partners' average level of intimate behaviors predicted the actors' for the entire sample, the type of group (prison or campus) was significantly related to the intercept for current intimate behaviors. Specifically, the members of the college growth groups engaged in twice as many intimate behaviors in a session (26% of the 20 IRScl behaviors) as members of the prison trauma groups (a subset of the current sample). The type of group was not significantly related to any of the other terms in the model.

This finding is interesting as it indicates that the type of group (semi-structured, manualized treatment versus open-ended process group), the type of population

(prisoners versus university students), the treatment focus (trauma versus interpersonal growth) and gender make-up (all women versus mixed gender) are all variables related to the level of intimate behavior occurring during group sessions. More research is needed to determine the amount of variance accounted for by these factors.

Group Climate Over Time

In general, the current sample of women followed similar patterns as other groups in terms of a high amount of perceived group engagement and low amounts of group avoidance, and the pattern of change on these dimensions, over time. Specifically, the current sample perceived increasing amounts of engagement and decreasing amounts of avoidance. Previous research on group climate development also has found trends toward increased engagement (e.g., Ogrodniczuk & Piper, 2003; Tasca, Balfour, Ritchie, & Bissada, 2006) and decreased avoidance (Kivlighan & Lilly, 1997; Tasca et al., 2006). Group conflict has been found in other research to remain consistent (Kivlighan & Lilly, 1997; Ogrodniczuk & Piper, 2003) or to resemble an inverted U shape (Kivlighan et al., 2000). In the present study, conflict was found to decrease over time, across groups. Interestingly, treatment Completers found themselves in groups where the other group members perceived lower levels of conflict, and that this conflict decreased quickly over the course of treatment. On the contrary, members that did not complete treatment found themselves in groups where the other members perceived a higher level of conflict that gradually decreased over time. Therefore, it could be stated that perceptions of group conflict may have played a role in whether or not a group member completed treatment.

Actor Effects

Engagement. Perceived group engagement for the actor significantly increased over time, however, PTSD outcome was not related to individuals' average level of perceived engagement, nor the increase over time. This is surprising given the importance of group engagement found in other studies (Kivlighan & Holmes, 2004). One explanation may be that there was not enough between-person variability in terms of perceptions of engagement to detect a relationship between engagement and PTSD change, as participants, on average, saw the group as moderately to highly engaged. Had more between-person variability been observed in the final sample of women, differences might have been detected between those who saw the group as highly engaged, and those who saw the group as less engaged.

Avoidance. Avoidance was found to significantly decrease over time, however PTSD outcome was not related to the person's average level of perceived avoidance, nor the decrease in avoidance over time. Again, a lack of between-person variability may have obscured the relationship between perceived group avoidance and PTSD change; in other words, on average, group members reported perceiving uniformly low levels of avoidance. More between-person variability may have shed light on a potential relationship between perceptions of group avoidance and PTSD symptom change.

Conflict. Conflict was found to decrease over time, however PTSD outcome was not related to the person's average level of perceived conflict, nor the decrease over time. Again, a lack of between-person variability evidenced in the final sample may have obscured the nature of this relationship.

Intimate behaviors. The level of intimate behaviors observed in the present study were similar to those observed in one other study (Kivlighan et al., 1993) and lower than

those observed in another study (Miles, et al., in preparation). It may be that, given the sequelae of trauma, including major disruptions in later interpersonal functioning (Lamoureux et al., 2010; Neumann, Houskamp, Pollock, & Briere, 1996) participants in the current sample were engaging in fewer intimate behaviors during group sessions given their trauma histories. On the one hand, the context in which the groups were occurring (a prison) may not have been conducive to intimate sharing for a variety of reasons, including a lack of privacy, worries about breaches of confidentiality among the members, and the re-traumatizing aspects of a prison environment (Talvi, 2005). Also, the semi-structured nature of the treatment protocol may have left less room for intimate behaviors to be enacted by group members. On the other hand, given these constraints, one might expect that even fewer or no intimate behaviors would be occurring, however that is certainly not the case with the present sample. More research is needed to determine the relationship between context (e.g., a prison) and amount of intimate behaviors enacted by group members.

Lastly, change in PTSD symptoms was not related to the person's average level of intimate behaviors. One reason for this finding may be due to the low level of between-person variability (14%); most of the variance was found to be between sessions. Had there been more between-person variability, a stronger relationship between actor intimate behaviors and outcome might have been detected. However, it is also possible that the amount of structure present in these groups moderated the relationship between intimate behaviors occurring during sessions and outcomes.

Partner Effects

Engagement. Significant increases were found for engagement over time. However, PTSD outcome was not related to the partners' average level of perceived engagement, nor the increase in engagement over time. While PTSD change was not related to the partners' increase in engagement for the whole sample, significant partner effects were found for engagement. For Completers, the other group members saw the group as more engaged than the other group members of non-Completers. Furthermore, the group members in groups with Completers began treatment perceiving a higher level of group engagement and their perception of group engagement gradually increased over time. The group members of Non-completers appear to start treatment perceiving a lower level of engagement in the group and have a steeper increase in the amount of perceived engagement.

One explanation for the lack of an observed relationship between partner perceptions of group engagement and change in PTSD may be that there was not enough between-person variability in terms of perceptions of engagement to evidence a relationship between engagement and PTSD change as participants, on average, saw the group as moderately to highly engaged. This was likely exacerbated by the missing PTSD change data for 22 participants, 20 of who dropped out of treatment before the final session. These participants may very well have found the group to be less engaged than their counterparts. Had the final sample of women been more of a "mixed bag" in terms of how engaged they viewed the group, differences might have been detected between those that saw the group as highly engaged, from those that saw the group as highly disengaged. It is interesting to note that for those who or dropped out of treatment, it appeared that how the other groups members (the partners) perceived the group climate

mattered more than how they themselves perceived the group's climate, as there were no significant actor effects observed.

Avoidance. The partners saw avoidance as significantly decreasing over time, however PTSD outcome was not related to the partners' average level of perceived avoidance, nor the decrease in slope over time. This lack of a relationship was likely not due to attrition, as no significant differences were observed between the 51 Completers and the 22 Non-completers on the dimension of avoidance. However, an overall lack of between-person variability may have obscured the relationship between perceived group avoidance and PTSD change as the partners, on average, reported perceiving uniformly low levels of avoidance. More between-person variability may have shed additional light on a potential relationship between perceptions of group avoidance and PTSD symptom change or led to more robust conclusions about the lack of an existing relationship.

Conflict. For the partners, group conflict was observed to significantly decrease over time but PTSD outcome was not related to the partners' average level of perceived conflict, nor the decrease over time. Because significant partner effects were found for group conflict for Completers versus Non-completers, a likely explanation is that participants dropped out of treatment if they were in groups where the other members were perceiving higher levels of group conflict that only gradually decreased over time. It is interesting that for everyone, it appeared that how the other groups members (i.e., the partners) perceived the group climate mattered more than how they themselves perceived the group's climate, as there were no significant actor effects observed.

Intimate behaviors. Partner effects were not observed for level of intimate behaviors as the level of IRScl did not change over time, and PTSD outcome was not

related to the partners' average level of intimate behaviors. No between-person variability was observed for intimate behaviors for the partners. Had participants been engaging in significantly different levels of intimate behaviors, it is possible that a potential relationship between that and change in PTSD might have been detected. Similarly, had there been more between-group variability (16%) differences in PTSD change might also have been observed.

Fit Between Actor and Partner

Person-group fit has been observed to be an important variable connected with outcomes in other, non-therapeutic settings (Judge & Ferris, 1992; Spokane, Meir, & Catalano, 2000; Hoffman & Woehr, 2006). Furthermore, recent research related to being an outlier in terms of intimate behaviors appears to be related to absences from subsequent sessions in interpersonal growth groups (Paquin, et al., 2011). However, in the current study (and contrary to hypotheses) an observed linear relationship between fit and PTSD symptom change was not found for participants on the dimensions of group climate and intimate behaviors.

Engagement, avoidance, and conflict. The level of congruence between an individual's perceptions and that of her group's on the dimensions of group engagement, avoidance, and conflict were not found to be related to PTSD symptom change. Results from three unconditional models testing group climate perceptions indicated that, on average, the difference between the group member and her group on GCQ-S scores for engagement, avoidance, and conflict per session was less than one and not significantly different from zero. Therefore, a high level of congruence was observed overall on the dimension of group climate. One conclusion from this finding is that fit does not matter

in the current sample, and that this could be due to several factors, including the more structured nature of the group treatment in this study, the sensitivity of the measure, or other dimensions of group climate that the GCQ-S does not tap. However, it may be important to keep in mind that analysis was conducted only at the level of comparing aggregated means, rather than examining the profiles of individual participants who experienced the most (or least) PTSD change. Re-examining the data accordingly might reveal new information regarding the relationship between fit among these variables.

Another possible explanation for the lack of significant findings might be that the research incorrectly assumed that the relationship between group climate variables and PTSD change was linear, when in fact it may be multidimensional. So while no linear relationship between the criterion and predictor variables was found, it may be that a “peaks and valleys” relationship exists between the variables that could not be captured by the present data analyses (Ding, et al., 2005).

Intimate behaviors. The level of congruence between the actors’ level of intimate behaviors and the partners’ was not related to change in PTSD. Results from the unconditional model indicated that the average difference between the amount of intimate behaviors a group member engaged in and the amount of behaviors her group engaged in per session was less than one, and not significantly different from zero. Therefore, a high level of congruence was observed overall. Analysis at the level of the individual rather than as opposed to looking only at aggregated means of actors and partners might potentially reveal difference in an individual’s fit and her change in PTSD outcome. Furthermore, while fit on this dimension may not be related to PTSD outcomes, it may be that fit between a participant and her group in terms of intimate behaviors is relevant to

other outcomes, such as attending the following session, as evidenced by the study of interpersonal growth groups by Paquin et al. (2011). It also is possible that the pattern of change associated with PTSD is non-linear and that a non-linear relationship between intimate behaviors and change in PTSD symptoms might be better elucidated with alternative methods of modeling, such as multidimensional modeling (Ding, et al., 2005).

Strengths and Limitations

The current study builds on research from industrial/organizational psychology regarding person-group fit, and nascent findings related to the role of being an outlier in group psychotherapy. The time-series design represents a major strength of the current study, as data points for the predictor variables were gathered after each of 22 sessions for six groups over the entire course (11 weeks) of treatment. Another strength of the study was its use of hierarchical linear modeling to address the nested nature of the data (i.e., individual data are nested within groups, nested within sessions). Additionally, the use of the actor-partner interdependence model (APIM) allowed the researcher to account for the interdependence of the data, and to model both actor and partner effects to assess the relationship between the group member and her group, without confounding the actor's data with those of the group.

However, there are several limitations in the current study that should be noted. A primary limitation of the current study was its reliance on archival data. The researcher was limited to existing parameters established by the current data set and could not, for example, examine additional outcome variables, such as substance use. Given the nature of the treatment protocol—a conjoint treatment for both trauma symptoms and substance use disorders—clinically significant changes may have been observed using a measure of

substance use related thoughts or behaviors, and these changes may have been related to group climate and intimate behaviors, including fit on these dimensions.

Importantly, the archive also was limited to measuring PTSD only during the first and last sessions of treatment. Had even one additional data point been established for PTSD (during the second month of treatment, for example) this would have helped elucidate the pattern of change among all of the study variables, over time. Specifically, during HLM analyses, the pattern of the relationship between the predictor and criterion variables would have been more parsimoniously modeled with additional PTSD data. While the treatment demonstrated clinically significant change in PTSD scores at posttest, the role of the group in this change process remains unknown, and whether person-group fit “fits” into the equation

Another limitation of the current study was the roughly 30% of the final sample whom did not complete both pre- and posttest PTSD outcome measures. While analyses showed that participants who completed PTSD measures at both times were not significantly different on most dimensions than their “Completer” counterparts, *the other members of their groups were*, however, significantly different in terms of how they perceived group engagement and conflict. Therefore, the absence of outcome change data for these participants may have affected study results, specifically in terms of range restriction.

Additionally, the completer analysis included data for two participants who had completed the PTSD measure at posttest, but had failed to complete the measure at pretest. This was likely due to the participants joining after the first session of treatment and an oversight of a busy group leader. Running the analysis only including participants

who dropped out of treatment might reveal stronger connections between treatment dropout and the variables of interest.

Implications

Despite the study's limitations, the current study has several implications for future research. Person-group fit was not found to be a significant predictor of change in PTSD at the end of treatment, despite the finding from Paquin et al. (2011) that a lack of fit in terms of intimate behaviors puts a participant at greater risk for being absent in subsequent sessions. Additional research is needed to elucidate the reasons why this may be the case. For instance, it may be that semi-structured treatment protocols (as opposed to open-formatted, interpersonal process groups) moderate or mediate the relationship between how someone behaves during sessions, and successful treatment outcomes. It may also be that manualized treatments (such as TREM) are structuring participants right out of a chance to develop and practice interpersonal skills, build relationships among other group members, and give and receive feedback. This seems an especially important point to ferret out given the growing ubiquity of manualized treatments and the dying out of open-ended process groups in managed care settings. Future research might explore whether fit matters in different types of therapy groups, in different settings.

Given the extremely low rates of between-person variability (everyone was perceiving similarly high levels of engagement, low levels of avoidance, low levels of conflict, and engaging in similarly low-to-moderate levels of intimate behaviors) it would be premature to conclude that fit plays no role in group process and outcome in psychotherapy groups. Had a higher degree of between-person variability been evidenced on the predictor variables, it is possible that a significant relationship between fit and

outcome may have been detected. This may be true especially given the significant differences found between completers and noncompleters regarding how the other members of their groups perceived their group's climate.

Additionally, the findings of the current study are at least partially consistent with the research on group climate in groups. Specifically, the pattern of increased perceived engagement and decreased avoidance observed in the current sample is consistent with most other types of groups (e.g., Kivlighan & Lilly, 1997; Miles, unpublished manuscript; Ogrodniczuk & Piper, 2003; Tasca, et al., 2006). Additionally, while the level of intimate behaviors was comparable (albeit lower) than found in other studies, the finding that these behaviors did not increase over time was surprising, and inconsistent with other research. It is worth noting that despite increasingly "good feelings" toward their group's climate, intimate behaviors did not increase over time in the current sample.

This finding warrants further attention since, in addition to PTSD symptom reduction, clinicians (particularly TREM practitioners) working with trauma survivors are explicitly interested in creating a space for relationship building, and allowing members to "practice" intimate behaviors. The literature is clear that interpersonal trauma exposure can have a profound impact on interpersonal functioning which can translate into losses of interpersonal resources that worsen over time (Lamoureux et al., 2010; Neumann, Houskamp, Pollock, & Briere, 1996). A number of studies have tested models in which interpersonal or social resources mediate the relationship between CA experiences and symptoms of PTSD or depression and have found that interpersonal resource loss in particular is related to increased symptoms of PTSD and depression (Schumm et al., 2004, 2005, 2006; Stines et al., 2005; Vranceanu, et al., 2007, 2010). Moreover,

worsening symptoms of PTSD and depression may lead to further loss of interpersonal resiliency resources, making for a vicious cycle of resource loss and worsening symptoms (Johnson et al., 2007; Lamoureux et al., 2010). Conversely, if survivors are able to establish trust and intimacy with other group members, these relationships can become powerful resiliency resources. Therefore attending to reduction of PTSD symptoms while enhancing the intimate, interactional exchanges among members may be a crucial part of the equation for sustaining the gains in PTSD change demonstrated in the current study.

The current study assumed that the relationship among study variables was linear; an assumption that may have been incorrect. Multidimensional scaling (MDS) (Ding, et al., 2005) is a technique for analyzing longitudinal data; data that may not meet some of the statistical assumptions of other commonly used techniques such as HLM and Structural Equation Modeling (SEM). Multidimensional scaling may be a more appropriate tool for addressing the research questions in the present study because it requires minimal distribution requirements. Second, it gets researchers out of the predicament of having to specify a very specific model with a small sample. Third, neither SEM nor HLM provide estimates of individual difference indices; rather, they provide estimates of means, variances, and covariances. Most importantly (and building on this last point) as noted by Ding, et al. (2005) “if the nature of the data are concerned with change but not in the sense of growth, some latent growth models (such as HLM) cannot provide statistical estimates of change patterns” (p. 172). Therefore, MDS might be a more appropriate way of exploring individual change patterns in the current study, and to compare an individual’s pattern with that of her group.

Lastly, in addition to assumptions about the shape of change among the variables, the current study made assumptions about the nature of the concept of “fit.” Fit was operationalized as the difference among the means for a target individual and the rest of her group on both perceptual (GCQ-S) and behavioral (IRScl) measures. Furthermore, these measures were both self-report (GCQ-S) and observer rated (IRScl), respectively. These multi-method, multi-trait components of the study can reasonably be construed as one of the study’s strengths. However, there are several other ways to operationalize and measure a person’s fit with her group, and it is possible that in the current study conceptualizing fit differently may have led to different results. For instance, in conjunction with comparing means between an individual and her group on behavioral observations or member self-report measures, future research could triangulate these data through examining fit in the following ways (using a rating scale or card sort method) (Funder, 1997):

- Asking the other group members what the target member would say if asked how well she fits in with the group (on a particular dimension);
- Asking the other group members how well the target member fits;
- Ask the target member how well she fits;
- Ask the target member what she thinks the rest of the group member will say if asked how well she (the target) fits with the group;
- Ask the group leader to report on each member’s level fit within the group.

While the restrictions inherent to archival data prevented access to examining fit from these perspectives, additional analysis of data in the present study could involve examining fit on additional variables included in the data set such as diagnosis (PTSD vs. subclinical PTSD; Axis I vs. Axis II, etc.), age, or race.

Conclusion

Despite decades of group therapy research, surprisingly little is understood about the underlying mechanisms of change, and specifically, how the thoughts, feelings, and behaviors of group members – during sessions— predict those of the other group members. This is partly due to the methodological problems inherent to collecting and analyzing time-series, nested small group data. The current study sought to borrow the concepts of person-group fit (from vocational psychology) and convergence (from dyadic therapy) and apply them to group psychotherapy in an effort to understand the role fit might play in this domain, using the APIM and HLM.

Person-group fit in organizations appears to be related to important outcomes including compliance with important group norms, enhancing group performance, having better work relationships, a higher likelihood of providing and accessing resources within the group, in-role job performance, organizationally directed citizenship behavior, and job satisfaction (Adkins et al., 1996; Judge & Ferris, 1992; Kristof-Brown & Stevens, 2001; Kristof-Brown et al., 2005; Werbel & Gilliland, 1999). Furthermore, congruence between client and therapist in dyadic therapy in terms of perceptions, expectations, and recall of critical events appears to be connected to better outcomes, and a lack of congruence can lead to early termination (Gulas, 1974; Kivlighan & Gayle, 2000; Borghi, 1968; Sandler, 1975). Similarly, being an outlier in terms of in-session, intimate behaviors was found to be related to being absent from the following session (Paquin et al., 2011). Results from the current study, however, did not demonstrate support for a relationship between congruence between a trauma recovery group member and her group and change in PTSD symptoms.

It could be the case that fit matters in groups similar to the current sample, but not on the dimensions of group climate and intimate behaviors. It may also be that fit matters but is related to some other outcome, such as predicting attendance of group sessions, rather than change in PTSD. It is possible that the structured nature of the treatment program mediated or moderated a relationship between level of fit and PTSD change and that only analysis at the individual level (as opposed to aggregated means) would reveal these effects. Lastly, the pattern of change of the variables in the current study may not be linear; thus, nonlinear modeling, such as MDS may be instructive. Given the importance of fit in other domains, fit as a construct related to group therapy warrants future research.

Table 1

Completely Unconditional Models for Each Variable (Actor, Partner, Fit) – Variance Partitioned

	Total variance (sigma squared + Tau1 + Tau 2)	Between Sessions (Sigma squared/total)	Between People (Tau 1/total)	Between Groups (Tau 2/total)
Actor				
Engaged	0.91	0.60	0.40	0.00
Avoidance	1.84	0.48	0.52	0.00
Conflict	1.05	0.64	0.36	0.00
IRScI	12.73	0.79	0.14	0.07
Partner				
Engaged	0.18	0.97	0.00	0.03
Avoidance	0.19	0.73	0.05	0.22
Conflict	0.17	0.90	0.00	0.10
IRScI	7.02	0.84	0.00	0.16
Fit				
Engaged	0.89	0.48	0.52	0.00
Avoidance	2.14	0.44	0.56	0.00
Conflict	1.10	0.58	0.42	0.00
IRScI	7.08	0.70	0.30	0.00

Table 2

Final PTSD Change Models for Actor, Partner, and Fit between Actor-Partner

	Outcome Variable	Gamma Coefficient	Standard Error	T-ratio	Df	P-value
Actor						
	Engagement	5.65	0.09	64.00	5.00	0.00
	Engagement & PTSD Change	0.00	0.01	-0.18	49.00	0.86
	Engagement Slope	0.05	0.01	7.14	49.00	0.00
	Engagement Slope & PTSD Change	0.00	0.00	0.27	49.00	0.79
	Avoidance	3.68	0.14	26.06	5.00	0.00
	Avoidance & PTSD Change	0.00	0.01	-0.09	49.00	0.93
	Avoidance Slope	-0.02	0.01	-2.59	49.00	0.01
	Avoidance Slope & PTSD Change	0.00	0.00	1.71	49.00	0.09
	Conflict	1.84	0.09	20.43	5.00	0.00
	Conflict & PTSD Change	0.00	0.01	-0.25	49.00	0.80
	Conflict Slope	-0.32	0.01	-4.76	49.00	0.00
	Conflict Slope & PTSD Change	0.00	0.00	-0.22	49.00	0.83
	IRScI	5.30	0.45	11.66	5.00	0.00
	IRScI & PTSD Change	0.01	0.02	0.47	5.00	0.66
	IRScI Slope	0.12	0.06	2.00	5.00	0.10
	IRScI Slope & PTSD Change	0.00	0.00	0.17	5.00	0.87
Partner						
	Engagement	5.68	0.04	159.85	5.00	0.00
	Engagement & PTSD Change	0.00	0.00	0.03	5.00	0.98
	Engagement Slope	0.04	0.01	4.10	5.00	0.01
	Engagement Slope & PTSD Change	0.00	0.00	-0.40	5.00	0.71
	Avoidance	3.70	0.09	42.65	5.00	0.00
	Avoidance & PTSD Change	0.00	0.00	0.08	5.00	0.94
	Avoidance Slope	-0.02	0.01	-3.18	5.00	0.03
	Avoidance Slope & PTSD Change	0.00	0.00	-0.12	5.00	0.91
	Conflict	1.83	0.05	33.57	5.00	0.00
	Conflict & PTSD Change	0.00	0.00	-0.58	5.00	0.58
	Conflict Slope	-0.03	0.01	-5.04	5.00	0.00
	Conflict Slope & PTSD Change	0.00	0.00	0.08	5.00	0.94
	IRScI	5.25	0.44	12.07	5.00	0.00
	IRScI & PTSD Change	0.00	0.01	-0.21	5.00	0.85
	IRScI Slope	0.11	0.07	1.64	5.00	0.16
	IRScI Slope & PTSD Change	0.00	0.00	0.08	5.00	0.94

Table 2

Final PTSD Change Models for Actor, Partner, and Fit between Actor-Partner

Outcome Variable	Gamma Coefficient	Standard Error	T-ratio	Df	P-value
Fit					
Engagement	-0.02	0.10	-0.20	5.00	0.85
Engagement & PTSD Change	0.00	0.01	-0.19	49.00	0.85
Engagement Slope	0.00	0.01	0.67	49.00	0.51
Engagement Slope & PTSD Change	0.00	0.00	0.48	49.00	0.63
Avoidance	-0.03	0.16	-0.21	5.00	0.84
Avoidance & PTSD Change	0.00	0.01	-0.06	49.00	0.95
Avoidance Slope	0.00	0.01	-0.02	49.00	0.98
Avoidance Slope & PTSD Change	0.00	0.00	1.64	49.00	0.11
Conflict	0.00	0.10	-0.01	5.00	0.99
Conflict & PTSD Change	0.00	0.01	-0.13	49.00	0.90
Conflict Slope	0.00	0.01	-0.22	49.00	0.83
Conflict Slope & PTSD Change	0.00	0.00	-0.17	49.00	0.86
IRScI	0.07	0.22	0.31	5.00	0.77
IRScI & PTSD Change	0.01	0.02	0.35	49.00	0.73
IRScI Slope	0.01	0.01	0.59	49.00	0.56
IRScI Slope & PTSD Change	0.00	0.00	-0.05	49.00	0.96

Appendix A
 Group Climate Questionnaire – Short Form (GCQ-S)
 (MacKenzie, 1983)

INSTRUCTIONS: Read each item and then mark the appropriate answer to the right of the item. Indicate the extent to which each statement reflects your experience of group today, ranging from “1” for “not at all” to “7” for “extremely.”

	Not at all					Extremely	
1. The members liked and cared about each other.	1	2	3	4	5	6	7
2. The members tried to understand why they do the things they do, tried to reason it out.	1	2	3	4	5	6	7
3. The members avoided looking at important issues going on between themselves.	1	2	3	4	5	6	7
4. The members felt that what was happening was important and there was a sense of participation.	1	2	3	4	5	6	7
5. The members depended on the group leaders for direction.	1	2	3	4	5	6	7
6. There was friction and anger between the members.	1	2	3	4	5	6	7
7. The members were distant and withdrawn from each other.	1	2	3	4	5	6	7
8. The members challenged and confronted each other in their efforts to sort things out.	1	2	3	4	5	6	7
9. The members appeared to do things the way they thought would be acceptable to the group.	1	2	3	4	5	6	7
10. The members distrusted and rejected each other.	1	2	3	4	5	6	7
11. The members revealed sensitive personal information or feelings.	1	2	3	4	5	6	7
12. The members appeared tense and anxious.	1	2	3	4	5	6	7

Appendix A
PTSD Symptom Scale: Self-Report Version (PSS-SR) (Foa et al., 1993)

Participant _____ Date _____

Directions: Below is a list of the problems that people sometimes have after experiencing a traumatic event. Read each one carefully and fill in the number (0-3) that best describes how often that problem has bothered you **in the past 2 weeks**. Rate each problem with respect to the traumatic event that brought you into treatment.

- 0 = Not at all or only one time**
1 = Once per week or less/once in a while
2 = 2 to 4 times per week/half the time
3 = 5 or more times per week/almost always

Items	0	1	2	3
1. Having upsetting thoughts or images about the traumatic event that came into your head when you didn't want them to?				
2. Having bad dreams or nightmares about the traumatic event?				
2a- Having these bad dreams always center on being killed?				
3. Reliving the traumatic event, acting or feeling as if it were happening again?				
3a. Reliving the traumatic event as if I am moving in a rewind motion?				
4. Feeling EMOTIONALLY upset when you were reminded of the traumatic event (for example feeling scared, angrv. sad. guilty, etc.)?				
5. Experiencing PHYSICAL reactions (for example, break out in a sweat, heart beats fast) when you were reminded of the traumatic event?				
6. Trying not to think about, talk about, or have feelings about the traumatic event				
6a. And when I try hard enough NOT to think about the traumatic event I feel dizzy?				
7. Try ing to avoid activities. people, or places that remind you of the traumatic event?				
8. Not being able to remember an important part of the traumatic event?				
9. Having much less interest or participating much less often in important activities?				
9a. Having much MORE interest in activities that are unimportant?				
10. Feeling distant or cut off from people around you?				
11. Feeling emotionally numb (for example, being unable to cry or unable to have loving feelings)				
11a. Feeling emotionally transparent (for example, feeling like people are unable to see me)				
12. Feeling as if your future plans or hopes will not come true (for example, you will not have a career, marriage, children, or a long life)?				
13. Having trouble falling or staying asleep?				
14. Feeling irritable or having fits of anger?				
15. Having trouble concentrating (for example, drifting in and out of conversations, losing track of a story on television, forgetting what you read)?				
16. Being overly alert (for example, checking to see who is around you, being uncomfortable with your back to the door, etc.)?				
16a. Being overly aware of sensations or changes in my body?				
17. Being jumpy or easily startled (for example, when someone walks up behind you)?				
17a. Being acutely aware of smells, especially body odor?				

Appendix C
Interpersonal Relations Scale Checklist (IRScI) (Shadish, 1984)

	Group Member Name									
Interpersonal Relations Scale Checklist Session # _____ Date: _____										
1. Discloses true personal feelings, even if threatening or unpopular										
2. Encourages another to honestly express his/her feelings										
3. Discusses the reasons for one's own behavior										
4. Talks about weaknesses of self										
5. Discusses another's feelings										
6. Explains what is going on between others										
7. Expresses dislike of another's behavior										
8. Talks about own feelings and behavior										
9. Takes risk by engaging in personally revealing behavior such as crying, discussing fears, etc.										
10. Expresses anger at another										
11. Discusses change in attitude towards others										
12. Tries to explain what one thinks about oneself										
13. Asks another how he/she is feeling										
14. Tries out a behavior that is new or acknowledged to be different from past behavior										
15. Tells others of one's fears or insecurities										
16. Expresses dislike of own behavior										
17. States that one has changed one's mind about something										
18. Honestly discusses opinions and feelings, even if threatening or unpopular										
19. Expresses negative feelings about self										
20. Talks about the relationship of self to another										
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