Do I Fit With My Group? Within-Member and Within-Group Fit With the Group in Engaged Group Climate and Group Members Feeling Involved and Valued

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A longitudinal design was used to examine (a) the relationship between group member perceptions of engagement at the session (within-member), member (within-group), and group (between-groups) level and members’ feeling involved and valued, and (b) how the person–group fit and misfit at the session and member level predicts members feeling involved and valued. Data came from 112 students in 18 groups enrolled in an undergraduate group dynamics class. At each session, group members completed measures of the group’s engagement climate and items that assessed members feeling involved and valued. The engagement ratings were decomposed into between-group, within-group, and within-member components. Hierarchical Linear Modeling and Response Surface Analysis were used to analyze decomposed engagement and Involved/Valued scores. Results indicated that (a) members’ Involved/Valued scores were related to an engaged group climate at the session (within-member), member (within-group), and group (between-group) level; (b) within-group and within-member fit in perceptions of engaged climate positively predicted members feeling involved and valued; and (c) within-group and within-member misfit, interpreted as an “optimistic bias” (a member’s general rating of the group or her/his rating of a session is high but the group’s general rating is low) was associated with members feeling more involved and valued, than a “pessimistic bias.” Study results highlight the importance of decomposing engagement, and examining person–group fit in engagement perceptions, at the intraindividual, interpersonal, and group-as-a-whole levels to best understand its nuanced relationship between engagement and members feeling involved and valued.

Keywords: engaged group climate, fit with the group, members feeling involved and valued, multilevel analysis, Response Surface Analysis

Mary Sue, Clayton and Laura are members of three experiential learning groups. All three rate their group’s engagement as “5” on a seven-point engagement scale. However, the aggregate engagement for the other members of Mary Sue’s group is 5.1, for Clayton’s group the aggregate engagement is 3.8, whereas the aggregate engagement for the other members of Laura’s group is 6.3. Are Mary Sue’s, Clayton’s and Laura’s ratings of group climate equivalent? Should the context provided by the engagement ratings of the other group members be taken into account? For the most part group researchers have treated Mary Sue’s, Clayton’s, and Laura’s engagement ratings as if they were equivalent and ignored the group context in their statistical analyses (for exceptions see Hsu, Paquin, & Kivlighan, 2014; Lo Coco, Gullo, & Kivlighan, 2012; Paquin, Kivlighan, & Drogosz, 2013). It is clear, however, that Mary Sue’s engagement ratings “fit” (match, agree, are congruent) with the aggregate ratings of the other members of her group.
whereas Clayton’s and Laura’s ratings of engagement do not fit (in opposite directions) with the other members’ of their groups.

**Person–Group Fit**

Fit is a construct derived from person–environment interaction theory (e.g., Lewin, 1935). Person–environment (P–E) fit describes the situation when the person’s characteristics match the environment’s characteristics. Kristof-Brown, Zimmerman, and Johnson (2005) describe four types of P–E fit: person–job, person–organization, person–group (P–G), and person–supervisor. The fit or lack of fit in engagement ratings described above is an example of P–G fit. Kristof-Brown et al. (2005) define P–G fit as the interpersonal compatibility between individuals and their group. This compatibility can be assessed on a number of different dimensions (e.g., goals, values, personality). In this research we examine a specific dimension of P–G fit, perceptual P–G fit (Chatman, 1989), which examines the congruence between a group member’s perceptions of the group’s climate and the other group member’s perceptions of the group’s climate.

Kristof-Brown et al. (2005) describe three different ways of operationalizing P–G fit: (a) *perceived fit*, in which group members directly assess their compatibility with the group (“how compatible are you with the other members of your group?”); (b) *subjective fit*, which is assessed indirectly by calculating the compatibility of group members reports of both self and group perceptions; (c) *objective fit*, which also involves a calculation of compatibility but in this calculation the a group member’s perceptions are compared to other group members perceptions. In this study we examine objective fit by comparing a group member’s perception of group engagement with the other members’ perceptions of group engagement.

Earlier research on P–E fit used Profile Similarity Indices (PSI; absolute or relative difference scores and profile correlation coefficients) to calculate objective fit. Unfortunately, PSIs are conceptually ambiguous, discard important fit information, and are not sensitive to rater differences (Edwards & Parry, 1993; Marinaro & Kivlighan, 2012). Therefore, Edwards and Parry (1993) advocated polynomial regression and response surface analysis to assess person–group fit as an alternative to PSIs. Kristof-Brown et al. (2005, p. 295) suggested that: “One of the most dramatic changes to studies of P–E fit in recent years was the introduction of polynomial regression as an alternative to Profile Similarity Indices (PSIs) for assessing fit indirectly.”

Polynomial regression and response surface analysis examine three distinct aspects of person–group fit: agreement (fit), nondirectional disagreement (overall lack of fit), and directional disagreement (whether the person’s or the group’s rating is higher). Agreement can be either high (the member and the group agree that the group is high in engagement) or low (the member and the group agree that the group is low in engagement). Nondirectional disagreement is similar to the absolute difference in group member and other group member engagement ratings. The more the group members’ engagement rating diverges from the group’s rating of engagement, the greater the nondirectional disagreement. For directional disagreement, the group member’s engagement rating can be either higher or lower than the group’s engagement ratings.

A few organizational studies (e.g., Jansen & Kristof-Brown, 2005) and two small group studies (Hsu et al., 2014; Lo Coco et al., 2012) have used polynomial regression and response surface analysis to examine person–group perceptual fit. The results of the Hsu et al. and Lo Coco et al. studies will be reviewed when we describe the study’s hypotheses and research questions below.

Despite differences in how fit has been operationalized, in organizational settings P–G perceptual fit is positively related to group processes (i.e., commitment to the group; Vogel & Feldman, 2009) and outcomes (i.e., goal attainment; Kristof-Brown, Zimmerman, & Johnson, 2005). Similarly, in counseling Groups P–G perceptual fit is positively related to group processes (i.e., reasons for self-disclosure; Hsu et al., 2014) and group member outcomes (i.e., reduced distress; Lo Coco et al., 2012). These reviewed results suggested the potential association between member–group similarity in perceiving an engaged group climate, defined as *objec-
tive perceptual fit, and group members’ participation, which is the primary question investigated in the current study.

Between-Groups, Within-Group (Between-Person), and Within-Person (Between-Session) Engagement

Jansen and Shipp (2013) argue that time is the missing aspect in fit research. Specifically, they say that focusing on fit at a single point in time limits researchers’ ability to comprehensively understand fit because the assessment of P-G fit occurs in a temporal context (Lewin, 1935). P-G perceptual fit studies specifically, and P-G fit studies generally, have examined only one aspect of fit because researchers typically collect perceptual data at only one point in time. Cross-sectional data allow for examination of between-person fit, for example, how a member’s perceptions of engagement fit with her or his group’s aggregated perceptions of engagement. When perceptions are collected longitudinally, however, it is possible to examine both between-person (which will be referred to as within-group) fit and within-member (between-session) fit. To understand the difference between within-group and within-member P-G perceptual fit, it is important to first describe the partitioning of longitudinal data into three levels: within-member (i.e., between-session), within-group (i.e., between-member), and between-group.

The within-member/between-session level engaged scores are deviations in a group member’s engaged ratings from that group member’s average engaged rating across all sessions. The within-group/between-member level engaged scores are deviations in a group member’s average engaged ratings (aggregated across group sessions) from the averaged engaged ratings of all the members of that group. The between-group level engaged scores are differences in engaged ratings across groups, that is, the deviation of that group’s average engaged ratings (aggregated across all group members) from the grand mean of all groups’ engaged ratings. For a group member some sessions are seen as more engaged than other sessions; this is the within-member component of engagement. Within a group some members see the group as generally more engaged than do other members; this is the within-group engaged component. Finally, some groups are more engaged, on average, than other groups; this is the between-group component.

As noted above, when engaged group climate ratings are separated into these components we can examine two different aspects of P-G perceptual fit: within-group P-G perceptual fit and within-member P-G perceptual fit. Within-Group P-G perceptual fit is calculated by comparing a group member’s average engaged score (aggregated across sessions) with the engaged scores for her group as a whole. Within-Group P-G perceptual fit is comparable with how objective P-G perceptual fit has been examined in previous P-G fit research. Within-member P-G perceptual fit is calculated by comparing a group member’s engaged score in a specific group session fits with the engaged scores for her group as a whole. Within-member P-G perceptual fit has not been assessed in any previous studies.

Two recent studies, Kivlighan and Paquin (2014) and Kivlighan, Paquin, and Hsu (2014), used Curran and Bauer’s (2011) methods to separate group engagement ratings into within-member, within-group, and between-group components (see Kivlighan & Paquin, 2014; Kivlighan et al., 2014 for a description of the variance decomposition process). However, no studies have used both decomposition and polynomial regression and response surface analysis to examine within-group fit and within-member fit.

The Group Context for the Present Study and Proposal of Two Hypotheses

With the prevalent role played by teams and groups in many aspects of our lives there has been a renewed interest in using experiential learning groups to teach group/teamwork skills in undergraduate education (see Moreland, 2013). These experiential learning groups typically have a twofold purpose: (a) to help group members experience and learn about fundamental group processes and (b) to help group mem-
bers learn their strengths and weaknesses as group/team members.

Group climate is an important predictor of student learning in experiential learning groups (Castaño, Watts, & Tekleab, 2013), and one of the most widely used measures of group climate in small group research is the Engaged scale of the Group Climate Questionnaire (for a review see McClendon & Burlingame, 2010). Because student learning derived from experiential groups is directly related to the quantity and quality of a group member’s participation in the group, in this research we examine how fit with the group in perceptions of an engaged group climate is related to group members’ participation in their experiential learning groups.

Person–group fit theory predicts that agreement between members and their group in perceptions of engagement are related to better group processes. At the most basic level, the theory predicts that agreement about the group’s engagement should be related to members’ willingness to be involved in and committed to the work of the group. As pointed out above, however, there are important conceptual problems with this simple statement about agreement/fit. For example, if the member and the group agree that engagement was very low, would we expect this high level of agreement to be related to members feeling involved and valued?

Hsu et al. (2014) and Lo Coco et al. (2012) used polynomial regression and response surface analysis to examine a more complex conceptualization of agreement/fit. In Lo Coco et al. (2012) only when the member and the group agreed that attachment to the group was high, did the member have greater symptom reac-
tion. Similarly, in Hsu et al. (2014) only when the member and the group agreed that engagement was high, was the member more likely to disclose for positive approach reasons. Therefore, between-member agreement that there are high levels of engagement is related to better group processes and member outcome and between-member agreement that there are low levels of engagement is related to worse group processes and member outcome. Based on person–group fit theory and the results mentioned above, we hypothesized that within-group fit (between-member agreement) would be independently and positively related to group mem-
bers feeling involved and valued (Hypothesis H1).

As noted above no one has examined within-member fit. However we expected that within-member fit would have similar effects to within-group fit. Therefore we hypothesized that within-member fit would be independently and positively related to group members feeling involved and valued (Hypothesis H2).

Person–group fit theory is not explicit about the relationship between nondirectional fit (disagreement) or directional fit and group processes. In Lo Coco et al. (2012) nondirectional fit was unrelated to group member symptom change, however when the other group members rated their attachment to the group as higher than member did, that member had greater symptom reduction. In Hsu et al. (2014) neither nondirectional nor directional fit was related to the reasons the members gave for self-disclosing. Given the lack of theory and the inconsistent research findings we did not make hypotheses about the relationships between within-group directional and nondirectional fit, within-member directional and nondirectional fit, and group members feeling involved and valued.

Method

Participants

Participants were 112 undergraduates enrolled in an upper division psychology course titled “Group Dynamics” at a public liberal arts university in the southeastern United States. Participants in each class were randomly assigned to one of three groups each semester using the list randomizer function at random.org. The sample of 112 included 74 females (66%) and 38 males (34%). Six of the students were Black (5%); all others were White. All of the undergraduates were either junior or senior psychology majors of traditional age.

Data were collected for 10 weeks. A total of 18 groups met together for 75 minutes for 12 weeks. Data were collected beginning with the second session and were not collected after the final group session, resulting in 10 weeks of data. Mondays for discussion of a group dynamics topic (e.g., leadership, cooperation, communication etc.) and Wednesdays
for the experiential component focused on problem solving. Second year master students enrolled in a graduate psychology class “Group Leadership” facilitated six of the 18 groups. The role of the facilitators was to introduce the activity and then facilitate the postactivity discussion focused on how the group operated together (process). For the remaining groups the instructions to the activity and questions for the postactivity discussion were provided on an instruction sheet. For all groups, the professor in the class monitored group actions through a one-way mirror and would intervene if the groups strayed too far afield of their task. The groups remained constant throughout the semester-long experience. Weekly data used in this article were generated within 24 hours of each Wednesday’s class.

**Instruments**

All of the data was collected online using surveymonkey.com. There were generally nine questions on the survey. The first three questions asked the student to identify their group, their name, and the week. Two other questions were relevant for the current study: A three-item measure of members feeling involved and valued and the Group Climate Questionnaire–Short Form: Engagement subscale (MacKenzie, 1983). In both cases, the items for the questionnaires were randomly presented to the students each week so they never saw the same items in the same order.

**Group Climate Questionnaire-Short Form (GCQ-S).** The GCQ-S (MacKenzie, 1983) was used to measure group members’ perceptions of the group climate in this study. The GCQ-S comprises 12 items on a 7-point Likert scale, ranging from 1 (not at all) to 7 (extremely). Although the GCQ-S is composed of three scales—Engaged, Avoidance, and Conflict—for the purposes of the current study, we examined the Engaged scale only. All items on the Engaged scale are worded so that the group is the object of the rating (e.g., “The members liked and cared about each other”; “The members tried to understand why they do the things they do, tried to reason it out”). An Engaged score is calculated by averaging across the engaged items, therefore Engaged scores theoretically range from 1 to 7. The construct validity of GCQ-S has been tested extensively and research has demonstrated links between the GCQ-S scales and both group processes and group member outcomes (McClendon & Burlingame, 2010). The factor structure of the GCQ-S was confirmed using confirmatory factors analysis (CFA) in a recent study (Wang, Chen, Wang, & Lin, 2012). The internal consistency alphas for the Engaged scale across all members and sessions was .83.

**Members’ feeling involved and valued.** Group members feeling involved and valued was measured by three questions taken from Johnson and Johnson’s (2009, p. 281) five-item Post Decision Questionnaire. This questionnaire was designed to capture how involved and valued group members felt after participating in a group activity. The three specific items that we assessed were: “How much influence do you feel you had in your group’s decision making?”; “How satisfied do you feel with the amount and quality of your participation in today’s activity?” and “How well do you feel your group understood and listened to you?” These three questions were rated on a percentile scale with three verbal descriptions “Not at all” = 0%, “About half” = 50%, and “Completely” = 100%. A total Involved/Valued score was obtained by averaging across the three items. Therefore Involved/Valued scores could theoretically range from 0 to 100. It is important to note that these items examining members feeling involved and valued are written with the member (self) as the object of the rating. Because the construct validity of the Involved/Valued score has not been formally examined, we performed several analyses to examine the properties of a scale derived by combining these three questions. Initially we conducted a confirmatory factor analysis using Mplus (Muthén & Muthén, 2008), in which we specified a one-factor model. Because a one-factor model with three indicators is just identifiable, we did not examine model fit indices. The three items loaded on the hypothesized factor at .81, .68, and .80 for the understood, influence, and satisfied items, respectively. All of these loadings were significant (p < .001). These loadings were larger than loadings for items constructed to measure other group constructs like perceived
similarity (see, Dunlop & Beauchamp, 2011). The internal consistency in this sample for the member Involved/Valued scale, composed of the three items described above was $\alpha = .80$. We also examined the construct validity of this Involved/Valued measure in two additional ways. First a subset of the participants (groups = 9, group members = 57, sessions = 546) responded to the question: “If perceived self-efficacy is concerned with my beliefs in my capabilities to achieve a goal how much self-efficacy did I exhibit during today’s activity?” in addition to the three questions examining how involved and valued the member felt. The session-level correlation between the Involved/Valued score and this self-efficacy item was .68 ($p < .001$). We also hypothesized that member Involved/Valued scores would increase linearly across the 10 group sessions. A three-level growth model (sessions nested within group members who were nested within groups) for member Involved/Valued scores showed a linear increase over the 10 sessions ($\beta_{100} = .686, p < .05$). Taken together, these results suggest that the three-item member Involved/Valued scale is a valid measure of the group members’ participation in the group.

As noted above, the Involved/Valued scale items were worded to capture the group member’s own experience whereas the Engaged scale items are worded to capture members’ perception of the group’s experience. This difference in item wording might suggest that the Engaged group climate scale and Involved/Valued scale address different latent constructs and are thus distinct psychometrically (see Kivlighan, Lo Coco, & Gullo, 2014; Ledermann & Kenny, 2012). To empirically test this hypothesis, we used Mplus (Muthén & Muthén, 2008) to compare two models: one with all of the Engaged and Involved/Valued items loading on a single factor and the second with Engaged and Involved/Valued items loading on two correlated factors. The chi-square difference test indicated that the two-factor model provided a better fit to the data than the one-factor model, $\Delta \chi^2 (df = 1) = 233.57, p < .001$. In the 2-factor model Engaged scale and the Involved/Valued scale were significantly correlated (0.53, S.E. = 0.03, $t = 16.26, p < .001$). This finding suggests the members seeing the group as engaged and their feelings of being involved and values in the session are correlated, but not to an extent that they could be viewed as a single construct.

**Procedure**

The structure for each Wednesday’s class began with a 10-min “check-in” time for catching up with one another regarding events not related to class. Groups were strongly encouraged to only share information related to their daily lives and to refrain from self-disclosing more historical information. Next, each group was presented with written instructions for an experiential activity that would last for 30 minutes.

Most of the activities required “props” and involved physical movement. Two activities serve as examples of those used in the class. One involved 27 lengths of [1/2] inch PVC pipe ranging in size from 3 to 18 inches in length resulting in 54 holes along with 23 connectors (including one cap) that would create 53 holes. The objective was to build the tallest freestanding structure. The rules required all lengths and connectors to be distributed among all group members. Each member could only place his or her pieces on the structure. Once a connection was made, it was considered “permanent.” A second activity involved an $11 " \times 17 "$ puzzle with approximately 25 pieces. The goal was to complete the puzzle as a group. All of the group members were blindfolded or asked to close their eyes. One person, appointed by the group, served as their “consultant.” The consultant could not touch the puzzle and could only answer “Yes” or “No” to any question asked by a group member.

After the 30 minutes of activity, groups discussed their experiences for at least 20 minutes. Groups were prompted to frame their reflections with the questions “What happened,” “So what” does that mean for our group, and “Now what” (Borton, 1970) have we learned that we will use in future groups. These questions were designed to parallel a “DAP progress note” and focus the group on describing, assessing what happened during the session, and planning what needs to happen in subsequent groups in order to further the group’s goals. Groups were strongly encouraged to keep their conversations to the “here and now” experience of only what occurred in
their group room. Groups would typically stay focused on the task they had just completed for at least the first third of the semester even when strongly encouraged to discuss the process of how they interacted with one another and how they might improve their interactions to be more productive.

Before midnight on the following day, each group member responded to the online survey items described above. In addition, each group member reflected in a discussion area of a learning management system on how well their group had followed the goals they had set forth during their first meetings together. Group members could only see responses of their own group members. Group responses were framed the same as the postactivity discussions to focus on a description of what they observed, an assessment of how well they were following their goals, and a plan for how they might improve.

Data Analysis

Initially a completely unconditional 3-level HLM analysis was run to partition the variance in Engaged scores into between-group, between-member, and between-session components. For Engaged 42% of the variance was between sessions, 16% of the variance was between people (ICC = .16, \( \chi^2(df = 94) = 414.60, p < .001 \)) and 42% of the variance was between groups (ICC = .42, \( \chi^2(df = 17) = 231.58, p < .001 \)). Therefore there was sufficient variance in Engaged scores at session, member, and group levels to justify decomposing these Engaged scores. Before predicting the dependent variable, Involved/Valued scores, we first decomposed engagement ratings into within-member (between-session), within-group (between-member), and between-groups components. Following Curran and Bauer (2011), the within-member effect was represented by the residual obtained from a within-person regression, regressing each group member’s engaged climate ratings separately, onto session number centered on the middle session. This process is also named “detrending” (p. 609). Within-group effects were represented by the deviation of each group member’s average engaged rating across sessions from the group’s mean engaged rating. The between-group effects were represented by the mean engaged rating described in the previous step. By operationalizing the effects in this way, the within-member, within-group, and between-groups effects were disaggregated into the three different levels in the Hierarchical Linear Model (HLM, Raudenbush & Bryk, 2002), which is specified below.

To examine within-member and within-group fit, the within-member, within-group, and between-groups engaged scores are used in a polynomial regression and response surface analysis (Shanock et al., 2010). In the first step, the researcher conducts a polynomial HLM to obtain the regression (gamma) coefficients, which are used to plot the three-dimensional (3D) response surface. To simultaneously assess within-group fit and within-member fit, we ran an HLM analysis with six specific predictors: (a) within-member engaged perceptions, (b) within-group engaged perceptions, (c) between-group engaged perceptions, (d) a quadratic term formed by squaring the within-member engaged perceptions, (e) a second quadratic term that is formed by squaring the within-group engaged perceptions, and (f) a third quadratic term that is formed by squaring the within-group engaged perceptions. Interaction terms for the two polynomial analyses were created by modeling specific cross-level interactions (see model below). It is worth noting that we only modeled two cross-level interactions: Within-member × Between-group, and Within-group × Between-groups engaged ratings, because this allows us to inspect how the group’s general engaged climate (as reflected by between-groups rating) provides context for members’ general perceptions (as reflected by the within-group, i.e., between-member ratings) or session-specific perceptions (as reflected by the within-member, i.e., between-session ratings) of engaged group climate. These are the interaction terms that would be in a typical quadratic model. In addition, the member Involved/Valued score in the prior session was used as a control variable in the analysis.

The specific HLM equation for this analysis is as follows.
Level-1 Model:

\[ Involved/Valued_{jk} = \pi_{0jk} + \pi_{1jk} \times (Involved/Valued \text{ in the prior session}_{ijk}) + \pi_{2jk} \times (Within-member engaged_{ijk}) + \pi_{3jk} \times (Within-member engaged^2_{ijk}) + \epsilon_{ijk} \]

Level-2 Model:

\[
\begin{align*}
\pi_{0jk} &= \beta_{00k} + \beta_{01k} \times (Within-group engaged_{jk}) + \beta_{02k} \times (Within-group engaged^2_{jk}) + r_{0jk} \\
\pi_{1jk} &= \beta_{10k} + r_{1jk} \\
\pi_{2jk} &= \beta_{20k} + r_{2jk} \\
\pi_{3jk} &= \beta_{30k} + r_{3jk}
\end{align*}
\]

Level-3 Model:

\[
\begin{align*}
\beta_{00k} &= \gamma_{000} + \gamma_{001} \times (Between-group engaged_{k}) + \gamma_{002} \times (Between-group engaged^2_{k}) + u_{00k} \\
\beta_{01k} &= \gamma_{010} + \gamma_{011} \times (Between-group engaged_{k}) + u_{01k} \\
\beta_{02k} &= \gamma_{020} + u_{02k} \\
\beta_{10k} &= \gamma_{100} + u_{10k} \\
\beta_{20k} &= \gamma_{200} + \gamma_{201} \times (Between-group engaged_{k}) + u_{20k} \\
\beta_{30k} &= \gamma_{300} + u_{30k}
\end{align*}
\]

The following coefficients from the HLM analysis were used to plot the response surface for within-member fit: (a) within-member engaged, (b) between-groups engaged, (c) a quadratic term formed by squaring within-member engaged, (d) a cross-level interaction term for the effect of between-groups engaged on within-member engaged, and (e) a second quadratic term formed by squaring between-groups engaged.

An algebraic representation of within-member fit from the final HLM model is as follows:

Involved/Valued intercept, \( \gamma_{000} \) = Within-member engaged, \( \gamma_{200} \) + Between-groups engaged, \( \gamma_{201} \) + Within-member engaged\(^2\), \( \gamma_{300} \) + Cross-level between-groups engaged interaction, \( \gamma_{201} \) + Between-groups engaged\(^2\), \( \gamma_{002} \).

The coefficients from the HLM model equations outlined in Edwards and Parry (1993) were used to calculate test values for four lines along this response surface: (a) the slope of the line of fit/agreement (\( \gamma_{200} + \gamma_{001} \)); (b) the curvature along the line of fit/agreement (\( \gamma_{300} + \gamma_{201} + \gamma_{002} \)); (c) the slope of the line of misfit/disagreement (\( \gamma_{200} - \gamma_{001} \)); and (d) the curvature along the line of disagreement (\( \gamma_{300} - \gamma_{201} - \gamma_{002} \)).

The response surface for within-group fit was plotted with the following coefficients: (a) within-group engaged, (b) between-groups engaged, (c) a quadratic term formed by squaring within-group engaged, (d) a cross-level interaction term for the effect of between-groups engaged on within-group engage, and (e) a second quadratic term formed by squaring between-groups engaged.

An algebraic representation of within-group fit from the final HLM model is as follows:

Involved/Valued intercept, \( \gamma_{000} \) = Within-group engaged, \( \gamma_{010} \) + Between-groups engaged, \( \gamma_{001} \) + Within-group engaged\(^2\), \( \gamma_{002} \) + Cross-level between-groups engaged interaction, \( \gamma_{011} \) + Between-groups engaged\(^2\), \( \gamma_{002} \).

The coefficients from the HLM model equations outlined in Edwards and Parry (1993) were used to calculate test values for four lines along this response surface: (a) the slope of the line of fit/agreement (\( \gamma_{010} + \gamma_{001} \)); (b) the curvature along the line of fit/agreement (\( \gamma_{020} + \gamma_{011} + \gamma_{002} \)); (c) the slope of the line of misfit/disagreement (\( \gamma_{020} - \gamma_{011} \)).
disagreement ($\gamma_{010} - \gamma_{001}$); and (d) the curvature along the line of disagreement ($\gamma_{010} - \gamma_{011} + \gamma_{002}$).

The lines of agreement and disagreement and an evaluation of the response surface are used to test H1 and H2.

Results

Before the main multilevel analysis, a preliminary missing value analysis was conducted. We found that among the 1,120 cases, member Involved/Valued scores had 6.8% of missing data; whereas the engaged climate scores had 6.5% of missing values. Because the missing data rate was greater than 5%, we performed independent sample $t$ tests to determine whether the pattern of missing value was completely random, as suggested by Hair, Black, Babin, and Anderson (2009). Results revealed no significant differences on indicator variables (in this study, member Involved/Valued scores and engaged climate ratings) between the group of present cases and missing cases, suggesting that these missing values were “ignorable” (p. 43). Therefore, we deleted the 76 cases with one or more missing values, and obtained a final dataset of 1,044 complete cases for further analysis.

Six of the groups had a master’s-level leader whereas the other groups did not. We used a 3-level HLM analysis to see whether groups in the leaderless condition (coded 0) were different from the groups in the leader condition (coded 1) on Involved/Valued scores or Engaged ratings. Leadership condition was not significantly related to Involved/Valued scores ($\gamma_{001} = 0.36$, $p = .886$) or to Engaged ratings ($\gamma_{001} = 0.07$, $p = .897$). Therefore leadership condition was not included in the main HLM analysis.

Table 1 displays the descriptive statistics for engaged climate and member Involved/Valued ratings averaged across all group members by each session. Given the structure of this dataset as session ratings nested within group members and member ratings nested within groups, we used the HLM technique. Another reason for the choice of this technique is that it allows for estimation of models that have different number of observations per group or per member, as is the case here.

Table 2 presents the final estimation of the fixed effects for the three-level HLM model. There was a significant within-group effect in predicting member Involved/Valued scores ($\gamma_{010} = 7.81$, $p < .001$). This means that the members within a group who rate the group, in general, as more engaged feel more involved and valued in sessions. We also found a significant within-member effect in predicting member Involved/Valued scores ($\gamma_{200} = 7.93$, $p < .001$). This means that, when the group members rate a session as more engaged, relative to other sessions, they feel more involved and valued in that session. The between-groups effect was also significant ($\gamma_{001} = 1.70$, $p < .05$), indicating that groups that have higher average engagement ratings also have higher average member Involved/Valued scores.

To examine whether within-member fit for engaged ratings was related to member Involved/Valued scores we examined the derived response surface (see Figure 1) and the slope and curvature of the response surface along the lines of engaged agreement and engaged disagreement (see Table 3). Lines of agreement and disagreement are displayed on the figures to help in interpretation. Also the significance tests in Table 3 can help orient the viewer in interpreting the figures.

As seen in Figure 1 the response surface is concave around both the line of agreement and the line of disagreement. However, the curvature around the line of agreement was not significant ($a_2 = 0.22$, $p = .941$). Likewise the curvature around the line of disagreement was also not significant ($a_4 = -1.30$, $p = .635$). These significance tests suggest that the response surface should be interpreted as a plane.
The slope (tilt) of this plane along the line of fit (agreement) shows the level of Involved/Valued scores at high and low levels of agreement between within-member and between-groups engaged ratings. As seen in Figure 1 there is an upward tilt of the plane from the front (−4, −4) to the rear (4, 4) of the figure. As hypothesized (H2), there was a significant positive slope (tilt) along the line of agreement (fit) ($a_1 = 9.26, p < .001$). This figure shows that, for groups that generally report a high level of engaged climate, when a member sees as session as higher in engagement than the typical session this member also reports feeling more involved and valued. Conversely, for groups that generally report a low level of engaged, in sessions that a member sees as lower in engagement than the typical session the member feels less involved and valued.

The slope of the response surface along the line of misfit (disagreement) shows the effect of discrepancies between within-member and between-groups engaged ratings on member Involved/Valued scores. As seen in Figure 1 there is an upward tilt of the plane from the left (−4, 4) to the right (4, −4) of the figure. This slope (tilt) along the line of misfit is significant ($a_3 = 6.22, p < .001$). This figure shows that a member’s Involved/Valued scores in a particular session is relatively higher in situations where the group generally reports a low level of engagement but the member sees that particular session as more highly engaged than the typical session, than in situations where the group generally reports a high level of engagement but that member sees that particular session as less highly engaged than the typical session.

### Table 2

**Final Estimation of Fixed Effects for the Full Model**

<table>
<thead>
<tr>
<th>Fixed effect</th>
<th>Coefficient</th>
<th>SE</th>
<th>t ratio</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involved/Valued intercept, $\gamma_{000}$</td>
<td>79.29</td>
<td>2.38</td>
<td>33.37</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Between-group engaged, $\gamma_{001}$</td>
<td>1.70</td>
<td>0.77</td>
<td>2.20</td>
<td>.044</td>
</tr>
<tr>
<td>Between-group engaged$^2$, $\gamma_{002}$</td>
<td>1.02</td>
<td>2.70</td>
<td>0.38</td>
<td>.709</td>
</tr>
<tr>
<td>Within-group engaged, $\gamma_{010}$</td>
<td>7.81</td>
<td>1.20</td>
<td>6.53</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Between-group engaged, $\gamma_{011}$</td>
<td>0.96</td>
<td>1.45</td>
<td>0.66</td>
<td>.518</td>
</tr>
<tr>
<td>Within-group engaged$^2$, $\gamma_{020}$</td>
<td>0.64</td>
<td>1.30</td>
<td>0.49</td>
<td>.629</td>
</tr>
<tr>
<td>Prior member Involved/Valued, $\gamma_{100}$</td>
<td>−0.02</td>
<td>0.04</td>
<td>−0.55</td>
<td>.59</td>
</tr>
<tr>
<td>Within-member engaged, $\gamma_{200}$</td>
<td>7.93</td>
<td>0.83</td>
<td>9.51</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Between-group engaged, $\gamma_{201}$</td>
<td>1.05</td>
<td>0.96</td>
<td>1.10</td>
<td>.288</td>
</tr>
<tr>
<td>Within-member engaged$^2$, $\gamma_{300}$</td>
<td>1.11</td>
<td>0.60</td>
<td>1.86</td>
<td>.08</td>
</tr>
</tbody>
</table>

![Figure 1](change_in_member_involved_valued.png)

**Figure 1.** Change in member Involved/Valued as predicted by within-member and between-group Engaged climate.
To examine whether within-group fit for engaged ratings was related to member Involved/Valued scores we examined the derived response surface (see Figure 2) and the slope and curvature of the response surface along the lines of engaged agreement and engaged disagreement (see Table 3). As seen in Figure 2 the response surface is concave around the line of agreement and convex around the line of disagreement. However, the curvature around the line of agreement was not significant \((a_2 = 2.78, p < .426)\). Likewise the curvature around the line of disagreement was also not significant \((a_4 = 0.34, p < .928)\). These significance tests suggest that the response surface should be interpreted as a plane. The slope (tilt) of this plane along the line of fit (agreement) shows the level of Involved/Valued scores at high and low levels of agreement between within-member and between-groups engaged ratings.

The slope of the response surface along the line of fit (agreement) shows the effect of fit at high and low levels of agreement between within-group and between-groups engaged ratings. As hypothesized (H1), there was a significant positive slope along the line of fit \((a_1 = 10.40, p < .001)\). This positive slope can be seen in Figure 2 from the front \((-4, -4)\) to the rear \((4, 4)\) of the figure. This figure shows that, for groups that generally report a high level of engaged climate, members who generally see their group

Table 3

Slopes and Curvatures of the Response Surface Along the Lines of Agreement and Disagreement for Within-Person and Within-Group Fit and Member Involved/Valued

<table>
<thead>
<tr>
<th>Effect</th>
<th>Coefficient</th>
<th>SE</th>
<th>t ratio</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within-member engaged fit and member Involved/Valued</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a1: Slope along (X_1 = Y) (as related to (Z))</td>
<td>9.26</td>
<td>1.25</td>
<td>7.404</td>
<td>.000</td>
</tr>
<tr>
<td>a2: Curvature on (X_1 = Y) (as related to (Z))</td>
<td>0.22</td>
<td>2.92</td>
<td>0.075</td>
<td>.941</td>
</tr>
<tr>
<td>a3: Slope along (X_1 = -Y) (as related to (Z))</td>
<td>6.22</td>
<td>1.03</td>
<td>6.023</td>
<td>.000</td>
</tr>
<tr>
<td>a4: Curvature on (X_1 = -Y) (as related to (Z))</td>
<td>-1.30</td>
<td>2.69</td>
<td>-0.484</td>
<td>.635</td>
</tr>
<tr>
<td>Within-group engaged fit and member Involved/Valued</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a1: Slope along (X_2 = Y) (as related to (Z))</td>
<td>10.40</td>
<td>1.00</td>
<td>10.426</td>
<td>.000</td>
</tr>
<tr>
<td>a2: Curvature on (X_2 = Y) (as related to (Z))</td>
<td>2.78</td>
<td>3.41</td>
<td>0.816</td>
<td>.426</td>
</tr>
<tr>
<td>a3: Slope along (X_2 = -Y) (as related to (Z))</td>
<td>6.60</td>
<td>1.87</td>
<td>3.524</td>
<td>.003</td>
</tr>
<tr>
<td>a4: Curvature on (X_2 = -Y) (as related to (Z))</td>
<td>0.34</td>
<td>3.69</td>
<td>0.092</td>
<td>.928</td>
</tr>
</tbody>
</table>

Note. \(X_1 = \) within-member engaged rating; \(X_2 = \) within-group engaged rating; \(Y = \) between-group engaged rating; \(Z = \) Member Involved/Valued.

Figure 2. Change in member Involved/Valued as predicted by within-group and between-group engaged climate.
as more engaged than the other members report feeling more involved and valued in sessions. Conversely, for groups that generally report a low level of engaged climate, members who generally see their group as less engaged than the other members report feeling less involved and valued in sessions. The slope of the response surface along the line of misfit (disagreement) shows the effect of discrepancies between within-group and between-groups engaged ratings on member Involved/Valued scores. There was a significant positive slope along the line of misfit ($a_3 = 6.60, p < .001$). This positive slope can be seen in Figure 2 from left (4, −4) to left (4, −4). This figure shows that, a particular member feels more involved and valued in situations where the group generally reports a low level of engagement but that member sees sessions as more highly engaged than other average members, than in situations where the group generally reports a high level of engagement but that member sees sessions as less highly engaged than other average members.

Discussion

Person–group perceptual fit is a useful model for understanding how an engaged climate at the group level can provide context for an individual member’s general and session-specific engaged climate ratings. As illustrated in the introduction a group member’s engaged ratings may agree or disagree with the ratings of her group. If there is agreement the member and the group may both see the sessions as either high or low in an engaged climate. If the member’s engaged ratings disagree with those of her group, her engaged ratings can either be higher or lower than the group’s engaged ratings. We built on recent research on person–group fit (Hsu et al., 2014; Lo Coco et al., 2012) and variance partitioning (Kivlighan & Paquin, 2014; Kivlighan et al., 2014) by examining fit in engaged group climate at both the session (within-member) and member (within-group) levels.

As hypothesized, when a group member’s high engaged ratings for a session were congruent with their group’s generally high engagement ratings, the member also felt more involved and valued in the sessions. Therefore both within-person and within-group fit independently predicted group members feeling involved and valued.

At the member-level agreement about a positive group climate is related to greater member symptom change (Lo Coco et al., 2012), more positive reasons for self-disclosing (Hsu et al., 2014), and greater feelings of being involved and valued in the group process (this study). Therefore, between-member differences in fit/agreement with the group are an important predictor of group process and outcomes. The current study suggests that between-session differences in fit/agreement can add independently to the prediction of group process. This suggests that future research should examine both between-member (within-group) and between-session (within-member) aspects of fit/agreement.

The role of disagreement in climate perceptions is far less clear. In Hsu et al. (2014) disagreement in climate perceptions was unrelated to reasons for member self-disclosure. In Lo Coco et al. (2012), when the group saw the climate as more positive than did the member, the member had greater symptom reduction. In this study, when the member saw the climate as more positive than did the group, the member reported feeling more involved and valued in the group sessions. The disagreement results in this study were independently present for between-member and between-session disagreements.

It could be argued that the group as a whole has a more accurate perception of the group’s climate than an individual group member. If this is the case then the members who generally see sessions or see some specific sessions as more engaged than the group may be experiencing an optimistic bias (Weinstein & Klein, 1996). In health research an optimistic bias has negative consequences because it can keep people from engaging in preventive behaviors (Weinstein & Klein, 1996). In this case, however, an optimistic bias may allow some group members to be involved with the group in spite of a less favorable group climate. The results on misfit (disagreement) also suggest that, if we categorize members’ perception biases into “optimistic bias” and “pessimistic bias” (where a particular member’s perception of engaged group climate is lower than the group’s general ratings), it
seems that optimistic bias would be more desirable than pessimistic bias, in that it leads to the member feeling more involved and valued in this group.

In the HLM analyses there were three significant main effects. Higher within-member, within-group, and between-groups engagement were independently related to group members feeling involved and valued. Recent research on individual therapy shows that between-therapist differences in therapy relationship variables are related to client outcome (e.g., Baldwin, Wampold, & Imel, 2007; Kivlighan et al., 2014). In other words some therapists are better than other therapists in establishing therapeutic relationships. In a similar manner some groups are better than other groups in establishing an engaged group climate. This makes sense because climate is seen as the group equivalent of relationship in individual treatment (McClenndon & Burlingame, 2010) and the group, as opposed to the therapist, is the major instrument of change in group treatments (Yalom & Leszcz, 2005). Our finding of a significant between-groups main effect is in line with Gully et al.’s (1995) meta-analysis that showed the importance of examining climate at the group level.

One reason that these group-level effects may be important is that engaged climate represents a group-level construct, thus aggregating the ratings of multiple members gives a better measure that is less error-prone than simply taking the individual ratings. Whatever the explanation for the group effects, it is clear that group studies that do not examine the effects of the group on the individual member are missing an important predictor variable! An important implication of the significant group-level effect for an engaged group climate is that group leaders should devote some of their attention to group-level interventions designed to increase the whole group’s perceptions of engagement.

We also found a significant within-group (between-member) effect. When a member generally rates group sessions to be more engaged, he or she tends to feel more involved and valued in sessions. This result is congruent with the majority of the group climate and cohesion literature which finds cross-sectional relationships between an engaged group climate and member outcome (see McClendon & Burlingame, 2010). Kivlighan and Paquin (2014) is the only other study that separated within-group and within-member effects with a longitudinal design. However, in Kivlighan and Paquin (2014) within-group engaged perceptions did not predict group members’ intimate behaviors in sessions, which is parallel to the results in Baldwin et al. (2007) and Kivlighan et al. (2014) that found no within-therapist (i.e., between-client) effects. Kivlighan and Paquin (2014) examined engaged perceptions and intimate behaviors for female prisoners in therapy groups focusing on trauma. In this study we examined engaged perceptions and member participation for male and female undergraduates in process groups focusing on learning individual, group and team dynamics. Major differences in the group intent and outcome measures used between the groups in the two studies may in part explain the divergent findings. It is possible that a within-group perception of an engaged group climate alone might not be a sufficient condition in facilitating intimate behaviors among prisoners but is powerful enough to affect student group members’ perceptions of being involved and valued. It is important for future group studies to continue to separate between-groups, between-member, and between-session effects to obtain a nonconfounded examination of the role of within-group engaged perceptions.

That certain group members generally view the group as more engaged than other group members and that these between-member differences are related to members feeling involved and valued provides important implication for group leaders. The group members who generally perceive the group as less engaged are less likely to be involved in the group experience. This finding shows that group leaders need to direct some of their attention and interventions toward group members who chronically see the group as less engaged than the other group members. Exploring how these group members view the group may be a productive line of inquiry.

Consistent with Kivlighan and Paquin (2014), when group members rate a session as more engaged, relative to other sessions, they feel more involved and valued in that session. This suggests that an individual’s rating of being involved and valued at a specific time point
(i.e., a certain session) is related to how engaged he or she perceives the group to be at that moment. This may be explained in light of the recency effect (Murdock, 1962), which theorized that people memorize better and are inclined to attend to more approximate stimuli and perceptions. Because engaged group climate and members feeling involved and valued were measured within 32 hours of each group session, it could be expected that individuals’ rating of effectiveness was more prone to the influence of their perceived group climate at the same recent session, instead of their general perception of the group’s engaged climate, or other group members’ perceptions (partner effect) about that session.

Taken together, the main effects discussed above show that perceptions of engaged group climate have a complex relationship to members feeling involved and valued. They are independently correlated with Involved/Valued scores at the session, member, and group level. As described by Tasca, Francis, and Balfour (2014), group leaders need to be tracking interactions and intervening at the intrapersonal, the interpersonal, and the group-as-a-whole levels if they are to be effective.

This current study builds on a growing body of research regarding the P-G fit and its relationship to group outcomes. Its integrative use of hierarchical linear modeling, variance partitioning, and Response Surface Analysis allows us to disaggregate an individual group member’s perceptions and to examine fit and misfit at both the member (within-group) and session (within-member) levels. In this way we operationalized relative fit or congruence, the common-sense idea of all members “being on the same page,” by contextualizing individual’s member- and session-level engagement perception into the group’s general rating.

There are several limitations in the current study that should be addressed. All of the group members were undergraduate psychology students participating as part of a group dynamics class. All the data generated were self-report, and although students were not graded on their individual responses to the surveys, they were graded on filling out the assessments in a timely fashion. In addition, our Involved/Valued measure has not been used in other research. Therefore we performed analyses examining the construct validity of this Involved/Valued measure but further validity evidence would be important. Finally, like most research on group climate perceptions this study is limited by the common rater confound (Heppner, Wampold, & Kivlighan, 2008), because both engaged climate and member Involved/Valued scores were rated by the group member. Specifically, as shown by Hoyt (2002), the variance partitioning procedures likely result in between-member ratings with a relatively high proportion of bias variance. Future research should consider having peers or outside observers rate how involved and valued the member was.

Studies examining the simple notion that agreement in engaged group climate perceptions is related to group processes and outcomes are common in the group process literature. This study is one of a growing number of studies (Kivlighan & Paquin, 2014; Kivlighan et al., 2014) that question this simple notion. Group, member, and session aspects of engaged perceptions were all related to members feeling involved and valued. In addition, both agreement and disagreement with the group in engaged perceptions was related to members feeling involved and valued. We need more research that continues to examine climate perceptions and fit as a complex multilevel phenomenon. We also need to modify P-G fit theory, that attempt to explain the complex effects of both within-group and within-member fit in perceptions of engagement.

References


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