COHESION IDENTITY AND AFFECT: THE ROLE OF GROUP ENTITIVITY

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Abstract

The following paper attempts to develop a new measure of group 'entitativity' and show how this measure relates to important concepts in group research. First, we review previous literature on entitativity, discussing measurement issues associated with entitativity and identifying a lack of a psychometrically valid measurement tools in the extant entitativity literature. Then, we explore an understanding of the concept allowing us to link it with climate strength, providing for a later examination of convergent validity. Next, we develop and test a measure of entitativity, linking it with group cohesion, group identity, and provide support for the relationship between our measure of entitativity and climate strength. Finally, we discuss the significance of these findings and the study of entitativity for the social sciences.

Introduction

There has been a recent surge in empirical and theoretical research on groups and teams (Marks, Mathieu, & Zaccaro, 2001), including topics such as affective tone (e.g., George, 1990), training and performance (e.g., Marks, Sabella, Burke, & Zaccaro, 2002), and negotiations (e.g., Mannix, Thompson, & Bazerman, 1989). Further, research exploring multi-level issues and theory has provided support for the existence of a variety of group-level phenomena (e.g., Ehrhart, 2004) as important predictors of many outcomes (e.g., Schneider, Salvaggio, & Subirats, 2002).

Despite this proliferation of research, studies rarely *directly* measure whether or not a group is perceived as a group. Instead, scholars indicate that shared levels of a variable, within a group, may be seen as evidence that group members are acting/thinking as a group (e.g., George & James, 1993), but rarely address group members' perceptions of a group's 'entitativity', or the degree to which a group is perceived as a unique and differentiable entity.

In order to provide such an exploration, this paper will unfold as follows: First, we explore the entitativity literature. Then, we develop hypotheses related to a measure of entitativity. We then compare this discussion to the literature on climate strength (CS), which uses other means of evaluating the existence of groups, and develop hypotheses relating entitativity with CS. Next, we develop a general measure of entitativity for the social sciences, providing empirical support for the validity of this measure through confirmatory factor analysis (CFA) and by showing predicted relationships which support our hypotheses. Our findings are then discussed.

Entitativity

Entitativity, proposed by Campbell (1958), is defined as that which gives a social unit "the nature of an entity, of having real existence" (Campbell, 1958, p. 17). While little research was conducted on entitativity for many years, there has been a recent renewal of interest in the topic (e.g., Abelson, Dasgupta, Park, & Banaji, 1998; Crawford, Sherman, & Hamilton, 2002). This began with work exploring findings indicating that individuals process information differently when it relates to an individual versus a group target. For example, Hamilton (1991) showed that individuals with high entitativity may be more likely to process information about a group in a way that mirrors processing

centering on an individual target, with a judgment of entitativity based on group-member similarity, proximity, and collective movement/shared fate.

Measuring Entitativity

A large body of literature addressing entitativity indicates difficulty in measuring the construct, due to the broad nature of the concept and a lack of measurement-focused work (e.g., Castano, Yzerbyt, & Bourguignon, 2003; Gaertner & Schopler, 1998; Lickel et al., 2000). Because of this difficulty, most studies of entitativity manipulate rather than measure group entitativity, (e.g. Crawford et al., 2002; Dasgupta et al., 1999). As such, a majority of entitativity literature has only been able to study entitativity as an independent variable (e.g., Brase, 2001; McConnell et al., 1997).

In order to evaluate the validity of an entitativity measure, we postulate relations between our measure and other constructs to which entitativity has been shown to be related. As discussed above, at the individual-level of analysis, entitativity is related to group cohesion (GC; e.g., Crawford et al., 2002) and group identity (GI; e.g., Castano et al., 2003). Thus, any measure of entitativity should relate to these two constructs.

Hypothesis 1: A measure of entitativity will positively relate to group cohesion.
Hypothesis 2: A measure of entitativity will positively relate to group identity.
Below, we explore CS, which has yet to be related to entitativity.

Entitativity and Climate Strength

CS (Chan, 1998; also called 'climate consensus' by some, e.g., Lindell & Brandt, 2000, and 'group consensus' by others, e.g., Bliese & Britt, 2001) relates to a variety of outcomes due to its relation to differences in perception across individuals within a group (Schneider et al., 2002). As discussed by scholars (e.g., Mischel, 1976), as the strength of a situation or climate increases (i.e., as within-group variance is reduced), individuals should begin to perceive it in the same way. The similarity among members which CS represents is interesting to consider when cast in the light of entitativity. As group entitativity has been shown to relate to similarity among group members (e.g., Abelson et al., 1998; Dasgupta et al., 1999), it follows that as perceptions of similarity within a group increase, so too will perceived entitativity. Further, if CS is what drives perceptions of similarity among group members, then it is logical to conclude that CS should be related to perceptions of entitativity, with this relationship holding along climate dimensions which are readily evident.

Hypothesis 3a: The deviation of scores within a group along a measure of positive affectivity will negatively relate to ratings of entitativity.
Hypothesis 3b: The deviation of scores within a group along a measure of negative affectivity will negatively relate to ratings of entitativity.

Method

Participants

Participants were recruited from undergraduate courses at Tulane University (*N* = 271).

Measures

All individuals were given measures of PA and NA (Watson, Clark, & Tellegen, 1988), a general measure of GI (adapted from Mael & Ashforth, 1992), a general measure of GC (from Johnson, & Fortman, 1988), and two eight-item measures of entitativity (in-group and out-group).

The eight-item measure was developed by examining work by both Campbell (1958) and Hamilton (1991). We opted for a general measure, meant to capture the idea of a perception of singularity and unity within a group. Based on this rational, we generated eight items meant to measure the construct very generally, with items such as "All in all, I don't think this group is like any other group that I can think of".

Design and Procedure

The current study used a minimal-groups paradigm (Tajfel, Billig, Bundy, & Flament, 1971). First, participants were first asked to fill out measures of PA and NA. Then, after random assignment to groups, participants took part in a tower building contest.

After 10 minutes, participants stopped and filled out measures of group identity and group cohesion. They then resumed the task, after which they completed two measures of entitativity, one with their own group as a referent, the other with the out-group as a referent.

Results

Confirmatory Factor Analysis

We conducted confirmatory factor analysis (CFA) using LISREL 8.71. However, because our participants were nested within groups, we first computed the within- versus between-groups covariance matrices for our entitativity data, allowing us to model only within-groups effects. We did this in accord with formulations for multi-level structural equation modeling (SEM; Muthén, 1989; Muthén, 1994), which requires an estimate of the population within-groups covariance matrix, in agreement with multi-level decomposition models (cf., Cronbach & Webb, 1979). We also used only within-groups data because, with a small second-level sample size, between-groups estimates of effects are often unstable and may suffer from inflated Type I error rates (Hox & Maas, 2001).

As we had data for each participant's in- and out-group ratings of entitativity, we modeled both simultaneously, with the assumption that each set of 8 items would load on their own entitativity factor (i.e., that there would be both an in- and out-group factor). We allowed error variances to correlate between similar items across the two targets, as assumptions of uncorrelated errors are not always tenable with repeated measures data (Kline, 1998). After comparing multiple models and examining item-loadings and model fit from the original 8 items, we selected three items (see Appendix) which allowed for adequate model fit for both in- and out-group ratings (see both Figure 1 and model 1 of Table 1; Hu & Bentler, 1999). Using these three items, we examined scale reliability using the within-groups covariance matrix for both in- and out-group ratings (i.e., reliability not confounding group effects). We also used LISREL to estimate scale reliability because α may over- or under-estimate scale reliability (Raykov, 2001). In accord with procedures outlined in Raykov and Shrout (2002), we estimated in-group entitativity reliability at .86 and out-group reliability at .79.

Measurement Invariance

Due to the difference in reliability observed above, we conducted a test for measurement invariance across in- and out-group targets (e.g., Byrne, Shavelson, & Muthén, 1989; Cheung & Rensvold, 1999). After establishing appropriate baseline models for each referent for our measure (see Figure 1), we constrained factor loadings across both in- and out-group ratings (for each respective item). No difference was found between the partially-constrained model and the unconstrained models ($\Delta\chi^2_{(3)}$

= 5.63, $p > .05$; see Table 1, model 2), indicating similar factor loadings across entitativity referents. In addition, we constrained error variances to be equal across both referents and found a statistically significant difference between in- and out-group ratings of entitativity between this and the loading-constrained model ($\Delta\chi^2_{(3)} = 22.07$, $p < .05$; see Table 1, model 3). This suggests partial measurement invariance across in- and out-group ratings of entitativity with our measure.

Measure Relationships

In order to provide further evidence of the validity of our measure, we sought to replicate relationships which have been demonstrated in the psychological literature. In order to conduct analyses examining relationships among variables of interest, we decided to examine relations among entitativity and other variables using both within-groups only, and between- and within-groups analyses. We conducted a within-groups only analysis in order to provide an accurate estimate of our measure for research conducted at the individual-level of analysis with data not nested within groups (see Table 2 for means, SDs, and item intercorrelations). In order to accomplish this analysis, we used the same method as our CFA above (i.e., we computed population estimates of the within-groups covariance matrix; Cronbach & Webb, 1979; Muthén, 1989; Muthén, 1994). Computing population estimates of both between- and within-groups data for in-group entitativity, GC, and GI simultaneously caused admissibility problems in our model, so we created testlets (an item-parceling technique) as outlined in Landis, Beal & Tesluk (1999). We used this technique because it allows a researcher to be sensitive to factor structures which exist within a dataset. Our final model estimates the path coefficients associated with the within-groups scores, indicating relationships which support hypotheses 1 and 2 (see Figure 2 for path coefficients, error variance, and disturbance estimates). Fit indices are within acceptable levels and indicate adequate fit (see Table 1, model 4; Hu & Bentler, 1999).

In order to provide an accurate estimate of the relationships found in the current data set using both between- and within-groups variance (i.e., using all variance in our dataset; Kenny, Mannetti, Pierro, Levi, and Kashy, 2002), we also conducted analyses using HLM. We did this to allow an accurate estimate of our entitativity measure's relationship with other variables for research conducted with individuals nested within groups (Nezlek & Zyzniewski, 1998; Pollack, 1998). Results from this analysis are provided in Table 3 and show similar relationships found in our structural model. However, this analysis also indicated a lack of a significant amount of variance in the relationship between GI and entitativity ($\chi^2_{(38)} = 43.9$, $p = .235$) and GC and entitativity ($\chi^2_{(38)} = 29.854$, $p > .5$) across groups, providing evidence for the stability of our effects. In utilizing both SEM and HLM we have provided a comprehensive evaluation of our measure of entitativity both between- and within-groups. Below we address hypothesis 3.

Multilevel Analysis

To test hypotheses 3a and 3b, we used the program HLM, to allow us to account for nonindependence among scores nested within groups while modeling the second-level effect of affective tone (Bryk & Raudenbush, 1992). In order to measure the amount of variance within groups along both NA and PA, we computed the standard deviation of NA and PA for each group. While a number of estimators of agreement exist for analyses of climate strength (Lindell & Brandt, 2000), our hypotheses concerned the amount of variance within each group and, as outlined in Schneider et al. (2002), standard

deviations are appropriate measures of this. Thus, we regressed entitativity onto the SDs of PA and NA, first standardizing the values along all variables.

Results indicated a statistically significant negative effect of within-group variance along PA on entitativity (γ = -.13, SE = .057, $t_{(36)}$ = -2.32, p = .026). Further, we found a statistically significant negative effect of within-group variance along NA on entitativity (γ = -.14, SE = .065, $t_{(36)}$ = -2.09, p = .044). These results indicate support for hypotheses 3a and 3b, showing that group member dissimilarity along affective dispositions predicted individual ratings of group entitativity. In other words, group heterogeneity lead to lower levels of perceived entitativity for our measure.

Discussion

The current study points to the importance of entitativity in a variety of ways. First, at the individual level of analysis, entitativity was shown to be related to both group identity and group cohesion, providing support for previous research indicating a relationship between entitativity and these constructs (e.g., Castano et al., 2003; Crawford et al., 2002). Because GC and GI were measured before entitativity, these relationships were shown predictively, indicating the usefulness of a measure of entitativity as a dependent variable, not only a manipulation. Also, at the individual level of analysis, we found a relatively strong relationship between perceptions of in-group entitativity and out-group entitativity (see Figure 1). This result suggests that perceptions of entitativity may be a cognitive heuristic which is applied to different types of groups.

Second, through our analyses, we have provided evidence for the validity of our measure of entitativity, utilizing both the within-groups and the between- and within-groups variance to support our conclusions (i.e., our SEM and HLM results). Toward the end of measure development were provided evidence of acceptable levels of fit in a CFA and partial measurement invariance across targets for entitativity ratings. This aspect of our study, we hope, will allow future researchers to utilize a concise measure of entitativity with relative confidence in its construct validity.

In conclusion, we have attempted to create and validate a psychometrically sound measure of entitativity, and show how this measure may be used to explain important group-related phenomena. We have outlined empirical evidence that rich insights may be gained regarding these phenomena by studying entitativity, and that these insights exist at multiple levels of analysis. At the individual level of analysis, we demonstrated that entitativity correlated with group identity and group cohesion, while at the group level we showed that dispersion in a group's affective tone predicted ratings of group entitativity. We hope that through these findings the current work will allow more well informed, full, and expedient explorations of entitativity perceptions, and we believe that we have shown such explorations to be key to a better understanding of groups.

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Table 1

Model Statistics

	SRMR	NFI	NNFI	CFI	GFI	χ^2	df
Model 1	.030	.99	.99	1.00	.99	10.04	5
Model 2	.057	.99	.99	.99	.98	15.67*	8
Model 3	.046	.97	.97	.98	.96	37.74**	11
Model 4	.043	.96	.96	.97	.95	60.21**	24

Note. SRMR = standardized root mean square residual, NFI = normed fit index; NNFI = non-normed fit index; CFI = comparative fit index; GFI = goodness of fit index; df = degrees of freedom; $*= p < .05$; $** = p < .01$; Model 1 = unconstrained model, Model 2 = factor loadings constrained model; Model 3 = factor loadings and error variances constrained model; Model 4 = structural model.

Table 2

Means, Standard Deviations, and Intercorrelations

Item	Mean	SD	Structural Model Correlations							
			E1	E2	E3	GC1	GC2	GC3	GI1	GI2
E1	3.62	.937								
E2	3.55	.912	.81							
E3	3.31	.961	.67	.74						
GC1	3.60	.896	.15	.23	.32					
GC2	3.21	.918	.36	.30	.40	.54				
GC3	3.67	.828	.35	.37	.47	.65	.73			
GI1	3.25	.699	.16	.23	.11	.06	.14	.16		
GI2	3.28	.799	.18	.27	.20	.06	.14	.15	.62	
GI3	3.32	.780	.15	.15	.11	.05	.17	.13	.51	.63

Note. E = in-group entitativity; GC = group cohesion; GI = group identity;

correlations are estimates of the within-groups population correlations, while

means and SDs are from original within- and between-groups data combined.

Table 3

HLM of Individual-Level Data

Effect	Gamma	SE	t	p
Fixed				
Model for group means				
INTERCEPT, γ_{00}	.002	.063	.027	.979
Model for GI-E				
INTERCEPT, γ_{10}	.139	.063	2.220	.032
Model for GC-E				
INTERCEPT, γ_{20}	.397	.066	6.016	<.001

	Parameter variance	χ^2	p
Random			
Group mean, u_{0j}	.053	55.209	.035
GI-E slope, u_{1j}	.038	43.900	.235
GC-E slope, u_{2j}	.039	29.854	>.500
Level 1 effect, r_{ij}	.733		

Note. HLM = hierarchical linear modeling; E = in-group entitativity; GI = group identity power; GC = group cohesion; degrees of freedom for both random- and fixed-effects are based on 39 groups, as data associated with one group was lost, due to inappropriate responding (discussed in our method section).

Figure Caption

Figure 1. Results from a confirmatory factor analysis modeling both in-group entitativity (EGIG) items 1 – 3 and out-group entitativity (EGOG) items 1 – 3.

Figure 2. Results from a structural model relating group cohesion (GC 1 – 3) and group identity (GI 1 – 3) to in-group entitativity (EGIG 1 – 3).
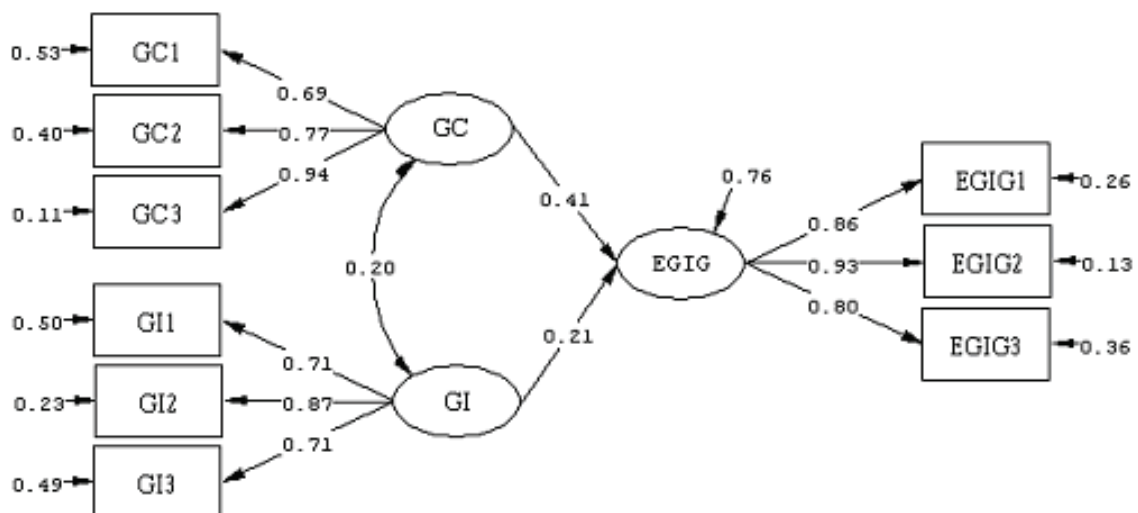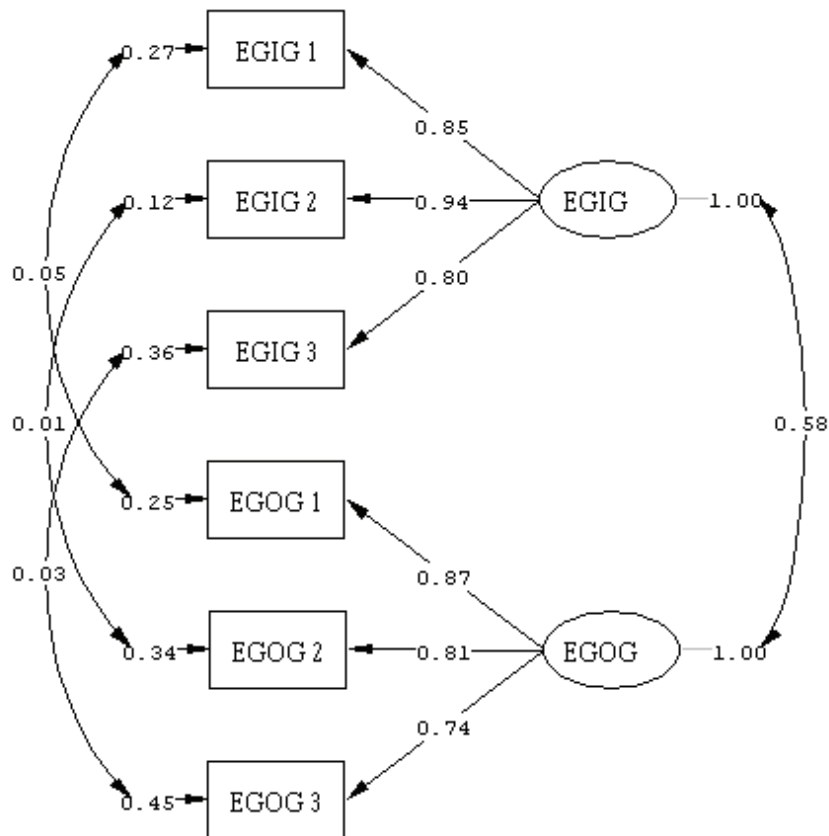
Appendix

Three-Item Measure of Entitativity

1. This group is unique.
2. This group is different from other groups.
3. There's something special about this group.