

# Are Positive Group Affective Tone and Task Complexity Moderating Variables in the Relationship between Team Cohesiveness and Team Performance (Inverted U)?

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# Are Positive Group Affective Tone and Task Complexity Moderating Variables in the Relationship between Team Cohesiveness and Team Performance (Inverted U)?

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**Abstract:** There are two potential moderating variables that can affect the inverted U-shaped relationship between work team cohesiveness and work team performance, which are positive group affective tone (PGTA) and task complexity. The purpose of this study is to investigate the moderating effects of positive group affective tone and task complexity on the inverted U-shaped relationship between work team cohesiveness and work team performance. The sample consists of 414 individuals from 90 work teams in 12 companies within the manufacturing and services sectors. There are two hypotheses proposed in this study. The first hypothesis is that positive group affective tone may moderate the U-shaped relationship between work team cohesiveness and team performance. The coefficient associated with this interaction term is statistically significant ( $p$ -value  $< .05$ ); thus, hypothesis one is supported. Hypothesis two suggests that task complexity may moderate the U-shaped relationship between work team cohesiveness and team performance. To test the hypothesis, this study employs the quadratic-by-linear interaction (cohesiveness<sup>2</sup> x task complexity) in the regression equation. The coefficient associated with this interaction term is not statistically significant ( $p$ -value  $> .05$ ); hence, the second hypothesis is not supported. The findings support the U-shaped relationship between work team cohesiveness and team performance. The quadratic term is significantly (negatively) related to team performance ( $\beta = -.392$ ,  $p$ -value  $< .01$ ).

**Keywords:** Cohesiveness, Performance, Group Affective Tone, Task Complexity, Inverted U-Shape

## Introduction

Team cohesiveness gives a stimulus to researchers in a variety of fields, e.g., social psychology, group dynamics, organizational behavior, educational psychology, clinical psychology, military psychology, and sports psychology (Mullen and Copper 1994; Carron and Brawley 2012). The reason for this great interest is the belief held by researchers that the cohesiveness construct plays a crucial role in a small group in determining the group's survival and or development (Lott and Lott 1965; Crawford and LePine 2013).

Team performance is the cohesiveness outcome mostly studied. The research into team performance and team cohesiveness has produced conflicting results. A number of studies have found a positive linear relationship between team cohesiveness and team performance, which means cohesive groups can improve team performance. Conversely, others have shown that there is a negative linear relationship between team cohesiveness and team performance, meaning that a high level of cohesiveness in teams can lead to lower team performance (Beal et al. 2003; Chiocchio and Essiembre 2009; Gully, Devine, and Whitney 2012; Hardy, Eys, and Carron 2005; Rovio et al. 2009). The integration of these two different results from the empirical studies conducted has led to a curvilinear model of relationship between team cohesiveness and team performance. The findings of Naibaho's study on the curvilinear model (inverted U-shaped) toward the relationship between the constructs of team cohesiveness and team performance support this model (Naibaho 2017).

There are potential two moderating variables that may influence the shape of the curvilinear model of the relationship between team cohesiveness and team performance, namely positive group affective tone and task complexity. High positive group affective tone is a consistent or homogenous positive affective reaction of team members toward their team

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(George 1990). A high positive affective reaction can affect team process in that team's emotion may influence the behavior of team members, e.g., biased decision making (Bower 1981). Members of groups with high positive group affective tone will prioritize interpersonal relationships among team members over team performance.

A high task complexity will pose greater difficulty for highly cohesive teams to achieve their goals (high performance) since the team members' focus is on the social bond among the team members instead on team performance. Task complexity refers to the form and strength of the relationship between information, acts, and products, as well as the sequencing of inputs (Wood 1986). The strong affective relationship of the team members of a highly cohesive team makes maintaining team's harmony more preferable than increasing team performance. The team performance will suffer greatly when task complexity is involved as it requires exchange of opinion or debate among team members in order to gain more insights for the execution of the task (Man and Lam 2003).

The purpose of this research is to perform an empirical testing on the influence of positive group affective tone and task complexity as moderating variables on the curvilinear relationship (inverted U-shaped relationship) between team cohesiveness and team performance. The findings of this study will give a contribution toward the development of the team cohesiveness construct. Additionally, it is the researcher's hope that a practical contribution could be given to organizations in designing intervention programs to prevent or buffer any negative consequences of a highly cohesive team.

## Literature Review

### *Work Team Cohesiveness*

The definition of work team cohesiveness employed in this research refers to the redefinition of cohesiveness proposed by Naibaho (2017), that is dynamic behavior which reflects the unity of a team driven by the fulfillment of instrumental and affective needs of the team members. This redefinition was obtained from the analysis of existing definitions of cohesiveness in the literature, wherein there was a similar pattern found in the key words used by previous researchers, i.e., remain in group, stick togetherness, and unification.

Team cohesiveness is considered effective in improving team performance due to the strong psychological connection among team members, emotional support, and team members' satisfaction with the team, all of which can prevent relational conflict (Barsade et al. 2000; Griffith 1988). When cohesiveness is formed within a team, its team members will accept the norms, objectives, assignments, and responsibilities in addition to the feeling of comfort that team cohesiveness can provide (Cartwright and Zander 1968), and in turn, team performance can increase. Cognitive diversity within a group can produce a breadth of knowledge, which is related with task completion, skills, abilities, different opinions and perspectives (van Knippenberg and Schippers 2007).

### *Inverted U-Shaped Relationship between Team Cohesiveness and Team Performance*

The findings of Naibaho's (2017) empirical testing support the inverted U-shaped relationship between team cohesiveness and team performance. A positive relationship between team cohesiveness and team performance was found only on certain levels of cohesiveness. The inflection point occurred when cohesiveness has reached the highest point where it becomes the cause of the downturn of team performance. It is the team's strong positive emotion, which is the result of high team cohesiveness that leads to the decline in performance.

The mechanism of the formation of a curvilinear relationship between team cohesiveness and team performance is cohesiveness will increase team performance to a certain degree. However, when a maximum point is reached, the increase in cohesiveness level will no longer

improve team performance due to the high positive emotion shared among the team members who belong to a highly cohesive team, so the team members will likely preserve the interpersonal relationships already built. As part of this effort, the team members will strive to cooperate with each other and stick to unity, which in turn will be manifested through ineffective decisions, hence optimum performance is neglected by team members and they fail to achieve their goals (Naibaho 2017).

### Positive Group Affective Tone

According to George (1990), group affective tone is a consistent or homogenous affective reaction in a group and it comprises both positive group affective tone (PGAT) and negative group affective tone (NGAT). Group members with high group positive affective tone will have a similarity in attitude and give a great influence toward the group process. Barsade et al. (2000), who examined the effects of affective diversity in groups, found that positive affect similarity would lead to team members' greater satisfaction toward their interpersonal relationships with other team members, higher inclination to cooperate and less conflict with one another.

The author assumes that when a highly cohesive team has a high positive group affective tone, then positive emotions in the team will increase, the pressure to conform to homogenous behaviour becomes higher, and groupthink will form swiftly. The author hypothesizes that positive affective tone may become a moderating variable in the curvilinear relationship between team cohesiveness and team performance (Hypothesis One).

### Task Complexity

Wood (1986) stated that task complexity has three dimensions: component complexity, coordination complexity, and dynamics complexity. Component complexity refers to the amount of different actions or activities, as well as the information process. Coordination complexity occurs due to the extremely strong relationship between the variety of task input and products. Dynamics complexity is formed when individuals need to adapt frequently due to changes in the cause-and-effect chain during task completion process. According to Man and Lam (2003), a complex task has a minimum structure and work implementation procedure, and it also requires discussions among team members about work completion methods. Due to the nature of the task, brain storming and debating to gain more alternatives in the execution of a task play an important role in the success of a job.

Members of a highly cohesive team have the tendency to avoid expressing different opinions or giving arguments because there is a high pressure for behaviour unity and the main focus of team members is on maintaining interpersonal relationships rather on tasks. Therefore, when a highly cohesive team given a complex task, the team's performance will be much lower. The author hypothesizes that task complexity will moderate the inverted U-shaped curvilinear relationship between team cohesiveness and team performance (Hypothesis Two).

### Research Methods

This study employs a quantitative survey methodology. Questionnaires are used to test the research hypotheses. The samples in this research are small-sized work teams, i.e., work team consisting of four to seven people (Pavitt and Broomell 2016). Out of twelve participating companies, ten are in the services sector and two in manufacturing, whose ownerships are local and multinational. The completed and returned questionnaires from the respondents are then checked in order for individual data aggregation to be used for team analysis. Data are acceptable on condition that all information is complete (all questions answered by respondents), and responses are not uniform for all questions on every variable.

After the checking of all questionnaires is complete, only the answers from 132 teams out of 150 teams can be used. The remaining eighteen responses are unacceptable due to (1) incomplete answers; (2) centralized answers; (3) the unfulfilled minimum requirement of four members in every team because of reasons (1) and (2). For example, in a team of four members, if one of the members did not answer all the questions and/or gave centralized answers, then the team had to be eliminated since it only had three people left.

The answers from these 132 teams are then evaluated to find the value of consensus degree based on individual variability, which can be used for team level analysis if the aggregation value of the individual data fulfills the minimum value of consensus degree (James, Demaree, and Wolf 1984). Consensus-based constructs such as team cohesiveness require within-unit homogeneity in order for unit-level constructs to have a meaning (Van Woerkom and Sanders 2010). This research employs inter-rater agreement,  $rwg(j)$ , to test the degree of within-unit homogeneity following the procedure suggested by James, Demaree, and Wolf (1984), with 0.7 as the minimum  $rwg(j)$  value for each team. Based on the calculation of the  $rwg(j)$  values from 132 teams, there are 42 teams whose minimum  $rwg(j)$  values are less than 0.7. There are 19 teams whose  $rwg(j)$  values of team cohesiveness are 0.61 to 0.67, and 23 teams'  $rwg(j)$  values of team performance are 0.59 to 0.66. The final sample size used in the hypothesis testing is 90 work teams consisting of 414 people.

The measurement of work team cohesiveness employed in this study is the one that resulted from the empirical testing conducted by Naibaho (2017) on the cohesiveness measurement developed by Davenport (2013). The latter was tested on work teams in Indonesia and the results showed that team cohesiveness measurement comprises four items of statement, i.e., feeling of happiness related with social activities, feeling of happiness resulting from being part of a team, feeling of happiness due to work activities, and togetherness in achieving goals. Cohesiveness is unidimensional, meaning task cohesiveness and social cohesiveness are considered one dimension.

The team performance measurement used in this study is that of Conger, Kanungo, and Menon (2000), which consists of five statement items. This performance measurement is in accordance with what Hackman (1987) and Mathieu et al. (2008) suggested, which is team performance measurement should not merely focus on objectives or quantitative goals but should also include behavior performance measurement.

To measure team task complexity, this study employs the measurement designed by Morgeson and Humphrey (2006), which consists of twelve statement items. Positive group affective tone is measured using the measurement built by Watson, Clark, and Tellegen (1988), consisting of nine items of statement. The hypotheses are analyzed using hierarchical linear regression in SPSS. The significance level is set below 0.05.

## Research Findings

The majority of the respondents in this study is male (87.43%). The respondents in this study are heterogeneous in terms of demographical background (race) and functional background (education). Based on their functional background, the percentage of high school graduate respondents and that of those having diploma and Bachelor certificates is nearly the same; hence the data heterogeneity in this group is fulfilled. The majority of respondents (53.63%) has joined their teams for over two years, while those whose length of team membership is one to two years constitute 46.37 percent of the respondents. There is 91.3 percent of respondents who have become team members since the formation of their teams. Previous studies have found that it takes two years to build a cohesive work team. Thus, with regard to the team-tenure characteristic, the work teams in this research are already cohesive (McGrew, Bilotta, and Deeney 1999).

The construct validity is measured using confirmatory factor analysis (CFA). In testing for convergent validity, average variance extracted (AVE) is used with a cutoff value of  $> .5$ . The

constructs will have discriminant validity if the AVE values are greater than those of squared correlation estimation (Hair et al. 2009; Fornell and Larcker 1981). The AVE values for the four constructs (work team, team performance, task complexity, and team emotion) need to be greater than the cutoff value in order for the four constructs to meet the criteria for convergent validity. If the squared correlation estimation value between variables is 0.4, discriminant validity will also be met (AVE > squared correlation between variables). The calculation of AVE values and squared correlation estimation values are based on the formula established by Fornell and Larcker (1981). The Cronbach's Alpha value for all variables are above 0.7. The results of the instrument reliability analysis using Cronbach's Alpha confirm the reliability of the instruments used as the values are more than 0.7 (Hair et al. 2009).

In analyzing the aggregation data from the individual to the team level, this study uses the four steps suggested Woehr et al. (2015): 1) Identifying the construct composition model, whether it is aptive, consensus or dispersive; 2) calculating the within-unit (Rwg) and across-unit values, Intra-class Correlation Coefficient {ICC(1)}, and ICC(2); 3) calculating the cutoff value of ICC(1) = M=0.21, SD=0.15 and ICC(2), M=0.66; SD=0.18 (if the ICC value is close to the mean, then the aggregation justification is met); 4) calculating the cutoff value of Rwg, M=0.67; SD=0.19. If the Rwg value is close to the mean, the aggregation justification of the within-unit is met. In general, the results from the individual data aggregation can be used for team level analysis as they fulfill the requirement for the aggregation justification. The results of the analysis are displayed in Table 1.

Table 1 Consensus of Team Members' Answers

Consensus Calculation Technique	Team Cohesiveness (TC)	Team Performance (TP)	Team Task Complexity (KP)	Positive Group Affective Tone
<i>Inter-rater agreement</i>				
$r_{wg(j)}$				
Mean	0.94	0.95	0.98	0.97
Deviation Standard	0.05	0.04	0.01	0.02
Median	0.96	0.97	0.94	0.94
Maximum	0.99	0.98	0.98	0.98
Minimum	0.73	0.7	0.82	0.81
<i>Intra-class Correlation Coefficient</i>				
ICC(1)	0.3	0.24	0.5	0.43
ICC(2)	0.66	0.6	0.82	0.77
Deviation Standard	0.22	0.23	0.21	0.22
F Statistics	2.94	2.43	5.41	4.41
	(p < .01)	(p < .01)	(p < .00)	(p < .00)

Source: Author 2017

The mean, standard deviations, correlations, and internal consistencies for each measures are shown in Table 2. Team performance is positively related to team cohesiveness ( $r = 0.736, p < 0.01$ ), positive group affective tone ( $r = 0.697, p < 0.01$ ), and task complexity ( $r = 0.651, p < 0.05$ ). Variable were centered prior to conducting regression analyses (Cohen et al. 2002). Table 3 shows that the curvilinear (inverted u-shaped) term is statistically significant ( $\Delta R^2 = 0.025, p <$

0.05). Therefore, the curvilinear (inverted u-shaped) between work team cohesiveness and team performance is supported.

Table 2 Means, Standard Deviations, and Correlations among All Variables

	<i>M</i>	<i>SD</i>	<b>1</b>	<b>2</b>	<b>3</b>
Team Cohesiveness	4.1738	0.3565	-		
Positive Group Affective Tone	4.0447	0.3261	0.607**	-	
Task Complexity	4.0327	0.3079	0.550**	0.687**	-
Team Performance	4.0863	0.2793	0.736**	0.697**	0.651**

N = 90; \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

Source: Author 2017

The testing of the research hypotheses is conducted using a series of stages in the hierarchical regression analysis. In stage one, all the independent and moderating variables, namely cohesiveness, positive group affective tone and task complexity are entered. Stage two involves entering the linear moderating effects. The third stage is the entering curvilinear effects (team cohesiveness squared form). In stage four, the curvilinear moderating effect is entered. The fifth and final stage is entering the three-way quadratic-by-linear effects. The results of the regression analysis are seen in Table 3.

The results of the analysis support the first hypothesis, i.e., positive group affective tone is confirmed to be a moderating variable in the curvilinear relationship between team cohesiveness and team performance; however, hypothesis two is not supported in this study. Task complexity is not confirmed as a moderating variable in the curvilinear relationship between team cohesiveness and team performance. The interaction coefficient is statistically insignificant (p = 0.203 for task complexity and p = 0.08 for positive group affective tone).

Table 3 Hierarchical Moderated Regression Analysis Predicting Team Performance

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Independent and Moderating</b>					
C	0.451***	0.469***	0.514***	0.603**	0.598**
PGAT	0.277**	0.307**	0.212*	0.388**	0.407**
TC	0.212*	0.275**	0.262**	0.127	0.123
<b>Linear Moderating Effect</b>					
C x PGAT		0.034	0.225*	0.143	0.174
C x TC		-0.105	-0.05	0.063	0.013
PGAT x TC		-0.024	-0.1	-0.097	-0.224
C x PGAT x TC		-0.139	-0.94	-0.136	-0.092
<b>Curvilinear Effect</b>					
C <sup>2</sup>			-0.254	-0.334	-0.392
<b>Curvilinear Modeling Effect</b>					
C <sup>2</sup> x PGAT				-0.299*	-0.400*
C <sup>2</sup> x TC				0.12	0.158
<b>Three-way Quadratic by Linear Effect</b>					
C <sup>2</sup> x PGAT x TC					0.226
<b>R<sup>2</sup></b>	0.663	0.677	0.702	0.721	0.725
<b>ΔR<sup>2</sup></b>		0.014	0.025	0.019	0.004
<b>F</b>	56.495***	0.891	6.738*	2.689	1.277

\*p < .05, \*\*p < .01, \*\*\*p < .001

C = Cohesiveness; PGAT = Positive Group Affective Tone; TC = Task Complexity

Source: Author 2017

## Discussion

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The results of the testing on the empirical data confirm that the relationship between work team cohesiveness and team performance is curvilinear (an inverted U-shaped relationship). The implication of the research findings is that team cohesiveness will have a positive relation with team performance at a certain point. When cohesiveness is high or reaches the highest point (turning point) then it can weaken team performance. The research data indicate that positive group affective tone moderates the curvilinear relationship between team cohesiveness and team performance. The implication of this is when a group's cohesiveness and positive affective tone are high, team performance will be more detrimental since team members will be less inclined to express different opinions in the team's decision-making process and instead, will be more inclined to maintain the harmony of the team. This finding is in line with that of Tsai et al. (2012), which suggested that positive group affective tone and team trust are negatively and significantly correlated to group creativity. When team trust and positive group affective tone are high, teams become less creative. This occurs due to uniformity pressure.

Task complexity is not confirmed as a moderating variable in the curvilinear relationship between team cohesiveness and team performance. A plausible explanation that can be offered for this result is that a highly cohesive team can lower team performance as a consequence of the self-inforcement of the team members to preserve interpersonal relationships and fulfill affective needs; thus, contextual factors such as task complexity will no longer have any influence on team members' behavior.

## Conclusion

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This study has found support to positive group affective tone as a moderating variable on the curvilinear model of the relationship between work team cohesiveness and team performance, yet it has found no support to task complexity as a moderating variable. In addition, the research data also confirms the inverted U-shaped model of relationship between work team cohesiveness and team performance. Based on the findings, this study suggests that in the event that work teams have become highly cohesive, which is manifested in collective-oriented behavior and the maintaining of personal relationships, managers should develop some interventions, e.g., changing the composition of team members. The purpose is to decrease the level of team cohesiveness and positive group affective tone in order for the group to be able to maintain its positive contributions to the organizations as well as to prevent negative consequences of high cohesiveness and high positive group affective tone. Additionally, the author also suggests that managers conduct intervention which is in the form of creating conflict in the team in order to lessen group affective tone. When team members start to feel incompatible with one another, then the pressure for uniformity behavior will diminish and team members will begin to behave differently.

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## Research Limitations

There are three limitations of this study. First, the research sample used to test the influence of the two moderating variables, i.e., positive group affective tone and task complexity consisted of work teams from profit-oriented organizations alone. Therefore, the author suggests that future studies include work teams from non-profit and public organizations in their research samples. Second, it will be useful to test other moderating variables such as team reward because according to Wittmer (1991), the individual-based reward system can lower team performance, while team-based reward system can increase and maintain desired team performance. Third, since the majority of the respondents in this research is male, future research needs to examine whether a variety of genders (composition of genders) contributes to different findings.



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