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THE EFFECTS OF TEAM ENABLERS AND TEAM COHESION ON PROJECT TEAM SUCCESS

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Abstract

The purpose of this study is to explore effects of team enablers (team autonomy and organizational support) and team cohesion dimensions on project team success and the mediating effect of team cohesion dimensions in this relation. Partial Least Squares Structural Equation Model (PLS-SEM) was used in the study conducted on 110 project teams which had 343 team members in a multinational financial institution. Reliability of the measures were calculated by Cronbach Alpha (a) coefficient and validity of the measures were calculated by exploratory and confirmatory factor analyses. As the unit of analysis is "project team", the question items were aggregated to team level by calculating the arithmetic mean and inter-rater agreement values (rwg) were checked for reliability. The findings of the research revealed that organizational support was a significant antecedent of team task cohesion and team effectiveness. Team task cohesion was found to have a partial mediating role in the relationship between organizational support and team effectiveness. In addition, although the significant positive effects of team autonomy on project team success dimensions were confirmed, none of the dimensions of team cohesion had a significant relationship with team autonomy. In accordance with the literature, positive effects of task cohesion on team effectiveness and team innovation were supported, however the effect of social cohesion on project team success was not significant.

Keywords: *Project team success, perceived team support, organizational support, team autonomy, team cohesion, task cohesion, social cohesion, team effectiveness, team innovation*

1. Introduction

According to Stewart (2006), the number of companies which adopt team-based structures has increased since the 1980s (Jin and Zhong, 2014, p. 517). Companies invest substantial resources
in teams. Understanding organizational factors which are related to team effectiveness is important. Thus, companies can lead their investments to maximize their performances (Kennedy et.al., 2009, p. 73).

2. Teams in Organizational Setting

According to Salas, Dickinson, Converse, & Tannenbaum (1992), teams can be defined as complex entities which have two or more people who interact adaptively and socially, have common or shared goals, and hold reasonable task interdependencies; it is structured and has a limited life duration; in it roles and expertise are distributed; and it is embedded in an environmental/organizational context which affects and is affected by continous processes and performances (Salas et.al, 2007, p. 189). Companies can have four types of teams namely project teams, parallel teams, management teams and work teams (Cohen & Bailey, 1997, p. 241). Project teams produce one-time unique outcomes, perform tasks which are cross-functional and non repetitive (Cohen & Bailey, 1997, p. 242).

3. Team Enabling Factors

3.1. Team Autonomy

According to Langfred (2004), team autonomy is the extent to which team members have discretion and freedom to initiate and regulate team actions (Chen et.al., 2018, p. 4). Trist (1981) acknowledges that autonomous work groups can be linked into the socio-technical model of group effectiveness. The model finds a way to optimize technological and social systems in the group to achieve effectiveness and productivity and improve self-managing teams. Trist and Bamforth (1951) describe early forms of self-managing teams in a coal mine in UK. According to Goodman et al. (1988) and Wall et. al. (1986), some examples were derived their intellectual foundation from this study (Man and Lam, 2003, pp. 983-984).

Hackman (2002) states that team autonomy enables the ones closest to task to make critical decisions (Haas, 2010, p. 990). Langfred (2000, p. 568) suggests that group autonomy is considered as a signal of management's faith and endorsement of the group which increases the team identity. Eisenhardt (1989) mentions that a lack of decision making autonomy can decrease long term product development speed, because not making decisions prevents the ability of team members to learn from experiences (Koch, 2011, p. 990). Gerwin and Moffat (1997, p. 1275) indicate that withdrawing autonomy decreases team performance. Carmen et.al. (2006, p. 196) comment that autonomy and informal communication are the informal team characteristics which affect innovation. Haas (2010, p. 1004) found that autonomy and external knowledge are positively associated with performance, operational and strategic effectiveness in companies.

3.2. Organizational Support

According to Eisenberger et.al (1986, 1997), the concept of organizational support proposes that employees build up beliefs which concern the extent to which their values and care about their well-being. In line with the social exchange view, employees reciprocate perceived organizational support with effort, attachement to the organization, job satisfaction, low absenteeism, and positive work behaviors (Gelbard and Carmeli, 2009, p. 465)
Similar to perceived organizational support, which is proposed by Eisenberger et.al. (1990), perceived team support is the extent to which teams perceive that an organization provides tools to perform. Perceived team support is measured at the team level and a management system, resources, and training are included in this concept (Pearce & Herbik, 2004, p. 296). Based on Hall's (1998) study, Kennedy et al. (2009, p. 75) suggested seven categories in which teams need organizational support: integration, group design, information systems, management support, teamwork training, performance measurement, rewards and recognition. They revealed a positive relationship between organizational support and potency which is mediated by team processes (Kennedy et.al., 2009, p. 72). Bishop et. al. (2005, p. 153) suggested that perceived support from an entity positively effected commitment to that spesific entity. Kim (2017, p. 1255) conveyed that the negative effects of attitudes toward diversity decreased in teams whose members had strong perceptions of organizational support. Ehrhardt (2014, p. 443), suggested that team members' perceptions of organizational support shaped project committment which is an important driver of team performance. Cramm et. al. (2013, p. 119) revealed that perceived effectiveness, organizational support, and management support predicted innovative culture of quality improvement teams.

4. Team Cohesion

Festinger (1950) believed that cohesiveness was "the resultant of all the forces acting on the members to remain in the group" He suggested the three dimensions to form cohesion namely member attraction, group activities, and prestige. However, other researchers have emphasized one of these dimensions. For example, Evans and Jarvis (1980) believed that mutual member attraction to the collective was the most well known definition of cohesiveness. Carron (1982) added that cohesiveness was a process to reflect tendency of a group to stick together and remain united to achieve a goal. Goodman, Ravlin, and Schminke (1987) added that cohesiveness was the members' commitment to the task of a group (Kozlowski & Ilgen, 2006, pp. 87-88).

According to Beal et.al. (2003) and Kozlowski & Ilgen (2006), group cohesion has two dimensions; namely task cohesion and social cohesion. Task cohesion is a shared commitment of a group to the task and increases commitment to the task and members' effort on the task. Social cohesion is an attraction of group members, allowing them to coordinate their efforts and have less inhibited communication (Picazo et.al., 2015, p. 297).

Picazo et.al. (2015, p. 297) suggests that task cohesion emerges stronger than social cohesion during the first stages of projects and task cohesion mediated the cross-lagged relationship between social cohesion and individual satisfaction with the team. Hirunyawipada, Paswan and Blankson's (2015, p. 855) study shows that team task cohesion mediates the relationship between organizational commitment and social competency and production of a successful idea. Chiocchio and Essiembre (2009, p. 382), in their meta-analysis, revealed that cohesion-performance effect in project teams demonstrated larger effect sizes than other teams. Mullen and Cooper (1994, pp. 2-3), highlighted that group cohesion might affect performance. Carless and Paola (2000, p. 71) suggested that task cohesion compared to social cohesion and individual attraction to the group was the strongest predictor of work-group performance. Beal et al. (2003, p. 989), in their meta-analysis, concluded that there was a stronger correlation between cohesion and performance when performance was defined as behavior, assessed with efficiency measures and as patterns of team workflow became more intensive.

5. Project Success

In the meta-analysis performed by Liu (2012), the most commonly-studied technical performance measures of teams were found to be efficiency, innovation, and effectiveness (Liu and Cross, 2016, p. 1150). In this study, effectiveness and innovation are accepted as project success measures, as efficiency and effectiveness measures are considered similar.

5.1. Team Effectiveness

According to Lee (2008), effectiveness is the extent to which the project outputs achieved the performance expectations of stakeholders. The expectations differs for various projects and across various stakeholders; several measures are used to measure effectiveness in the literature (Liu and Cross, 2016, p. 1152).
Literature reviews highlighted that the most frequent effectiveness measure of project teams were external perceptions of team members, managers, customers and other external stakeholders (Cohen and Bailey, 1997, p. 260).

5.2 Team Innovation

Amabile et. al. (1996, pp. 1154) states that innovations start with good ideas. They (1996, p. 1155) believe that creativity is the production of new and useful ideas and innovation is the successful implementations of creative ideas in an organization. West and Farr (1990) add that innovation is "the introduction and application, within a group, organization, or wider society, of processes, products, or procedures new to the relevant unit of adoption and intended to benefit the group, individual, or wider society" (West and Anderson, 1996, p. 681). According to Pirola-Merlo & Mann (2004) and West (2002), team innovation is the combination of the quality and quantity of ideas which are developed and implemented (Jordan, 2014, p. 26).

Drucker (1985) and Hirst et al. (2009) mention that team-level innovation is caused by challenges and problems that occur while striving toward goals and as an outcome resulting from teams developing and implementing original and useful solutions to these problems and challenges (Schippers, West ve Dawson, 2015, p. 771).
West et.al. (2003, p. 407) showed that there was a strong relationship between leadership clarity and team processes and team processes were strongly related with team innovation. Hülsheger, Anderson and Salgado (2009, p. 1128) performed a meta-analysis examining 30 years of literature and concluded that team process variables of vision, support for innovation, external communication, and task orientation showed the strongest relationships with creativity and innovation at team-level and with self-report measures. Glynn et. al. (2010, p. 1082) disclosed that strong team identification and perception of high interteam interdependence had positive influences on intentions of innovation.

6. .Relations among Construct

A number of researches which have studied the relations among the constructs included in the hypothesized model are demonstrated in Table 1.

Table 1. Literature Review on Relations among Constructs in the Hypothesized Model

Author/ Year	Purpose of the study	Sample	Measures	Analysis tool	Findings
Team Autonomy- Team Outcomes					
Chen et.al. (2015)	Explore the effect of team autonomy on the team operational results and the effect of technological turbulence on this relationship	212 new product development teams - 86 companies	Development speed (Kessler and Chakrabarti, 1999), development cost and product success Cooper and Kleinschmidt, 1987), team autonomy (Langfred, 2004), technological turbulence (Jaworski and Kohli, 1993)	Hierarchical regression analysis	The relationship between team autonomy and operational outcomes in technologically turbulent environments is inverse U-shaped and U-shaped in technologically stable environments. The operational results mediate the relationship between team autonomy and product success (p. 83)
Günsel et.al. (2012)	Investigate the relationships among software team flexibility (team autonomy, team diversity) and software project outputs (market success, speed to market, the functionality of the new software product)	86 software development projects	Team flexibility (Lee and Xia, 2007), market success (Cooper and Kleinschmidt, 1987), speed to market (Kessler and Chakrabarti, 1999), software functionality (Lee and Xia, 2007)	PLS-SEM in PLS-Graph 3.0	The results showed that the team autonomy positively affected market success, speed to market, and software functionality (p. 853)
Haas (2010)	Discover the effects of autonomy and external knowledge on the effectiveness of knowledge-intensive self-managing teams	96 teams in fin. and tech. dept.of a international company	Team autonomy (Hackman , 1987, 2000)-Other scales were developed by the authors.	Ordinal Logit Analysis	The significant positive effect of team autonomy and external information on team performance and the moderating effect of knowledge characteristics, task uncertainty and task pressure variables in this relationship were found.
Organizational Support-Team Outcomes					
Gelbard and Carmeli (2009)	Examine the interactive effect of team dynamics and organizational support on ICT project success.	191 ICT project managers	Organizational support, team dynamics, ICT project success (developed by authors)	Regression analysis	Team dynamics (communication, collaboration, knowledge sharing) were positively related to budgetary time performance and functionality performance of ICT projects. Also, organizational support was positively related to performance (p. 468)
Jin and Zhong (2014)	Investigate the relationship between perceived organizational support and team innovative performance, with team knowledge integration behavior as a mediating variable	127 scientific research teams in universities in China	Team innovation performance (Jin and Sun, 2010), perceived organizational support (Eisenberger et. al, 1990), knowledge integration (Lin and Wu, 2005)	Hierarchical multiple regression	Knowledge integration mediated the relationship between perceived organizational support and team innovative performance; climate for innovation and organizational context moderated the positive relationship between team knowledge integration behavior and team innovative performance (p. 517)
Kennedy et. al. (2009)	Focus on team members' perceptions of organizational support as antecedents of team	39 work teams in six organizations	Potency (Guzzo et al., 1993), team processes (Stevens and Campion, 1994), organizational	Multiple regression	Positive relationship was found between organizational support and potency that was mediated by team processes. A positive relationship between team processes and team performance was detected that was

	processes and potency		support (Hall, 1998).	analysis	mediated by potency (pp.72-88)
Team Cohesion-Team Outcomes					
Liu and Cross (2016)	Develop a model of project technical performance identifying the influencing variables (Management support, cooperation, communication, goal clarity, cooperation, team harmony, knowledge/skill and cohesion)	133 project teams	Team cohesion (Dobbins and Zaccaro, 1986), team effectiveness (Hoegl and Gemuenden, 2001), team innovation (Liu and Cross, 2016)	Regression analysis in SAS and SEM	The primary dimensions of project technical performance were found to be effectiveness, efficiency and innovation. Cohesion was related to innovation, there were no shared significant predictors across outcomes (p.1150)
Picazo, Gamero, Zornoza and Peiro (2015)	Investigate the effects of task and social cohesion on team satisfaction within a certain time interval in the project teams	74 teams in a MBA class	Task and social cohesion (Widmeyer, Brawley and Carron, 1985), team satisfaction (Mason and Griffin, 2002)	SEM	Task cohesion appears stronger than social cohesion during the first stages of projects. Task cohesion mediated the cross-lagged relationship between social cohesion and individual satisfaction with the team (p. 297)
Bahli and Büyükkurt (2005)	Identify, define and measure the determinants of group performance in ISD projects.	35 teams of undergrad students in MIS	Task and social cohesion (Chang and Bordia, 2001), team building (Salas, 1999), group performance (Hackman, 1990)	Partial Least Squares	Task cohesion positively effects group performance, however social cohesion does not have any effect on group performance (p. 109)
Organizational Support-Team Cohesion					
Ehrhardt et.al. (2014)	Investigate the antecedents and consequences of project commitment for members of cross-functional teams in light of signaling theory	24 product development teams in 6 manufacturing company in US & Canada	Team cohesion (Seashore, 1954), perceived team support (Peter et.al., 1985), project commitment (O'Reilly and Chatman, 1986)	Hierarchical regression analysis SEM	Project commitment significantly effects team performance. Many factors contribute to shape project commitment, including perceptions of members of an organization's support for the project. (p. 443)
Kim (2014)	Explore the leader's role in enhancing team members' atitudes, adopt a relational model including the role of the leader's social capital, perceived power, and team commitment in enhancing team-level perceived support, efficacy, and cohesion	84 leaders, 44 executives, and 469 team members	Organizational support (Kennedy et.al., 2009), team cohesion (Carless and Paola, 2000).	Hierarchical regression analysis SEM	Team climate for organizational support was found positively related to team cohesion (p. iii)

Mediating Effect of Team Cohesion					
Man and Lam (2003)	Examine the mediating effect of cohesion on the relationship between job characteristics and performance and moderating effects of individualism/ collectivism on job characteristics-performance relationship	381 teams in US and Hong Kong branches of a bank	Job complexity and autonomy (Hackman & Oldham, 1974), group cohesiveness (Widmeyer et.al., 1985),group performance (Heilman, Block, Lucas, 1992), collectivism (Erez and Earley, 1987)	Regression analysis	An increase in job complexity and/or task autonomy will increase group cohesiveness that subsequently increases performance. The positive effects of complexity and autonomy on group cohesiveness are more apparent in individualistic rather than collectivistic groups (p. 979)
Langfred (2000)	Explore the effects of autonomy at the individual and the group levels on group cohesiveness	67 teams in Illinois Children and Family Services	The worker/supervisor/manager instrument of the Organizational Assessment Inventory, (Van de Ven and Ferry, 1980)	Multiple regression	Group and individual autonomy effected group effectiveness in the two organizations studied. The group cohesiveness/group performance orientation interaction was found to partially mediate this relationship. Team autonomy in the Child and Family Services positively affected the team cohesion, but in the military sample the effect was insignificant (pp. 580-582)
Hirunyawipada, Paswan and Blankson (2015)	Investigate asymmetric effects of team cohesion and relational qualification of members on the creativity of new product ideas.	195 new product development practitioners in high-tech industries in US	Social and task cohesion (Carless and De Paola, 2000), product idea newness and usefulness to customers (Im and Workman, 2004), social competency (Kauffel, 2006), organizational commitment (O'Reilly ve Chatman, 1986)	SEM	The study shows that team task cohesion mediates the relationship between organizational commitment, social competency and the dimensions of a successful product idea. However, team members'interpersonal relationship does not have any relation with task cohesion and the product ideas (p. 855)

7. The Purpose of the Study

The purpose of this study is to explore the effects of the team enablers (team autonomy and organizational support) and team cohesion dimensions (task and social cohesion) on project team success dimensions (team effectiveness and team innovation). The mediating roles of task and social cohesion in the relation between enabler variables and project team success were also investigated. The field study was performed within knowledge-intensive project teams of cross-functional nature for new product, process and technology development in a private multinational bank in Turkey.

8. Hypothesis Development

Figure 1 shows our research model.

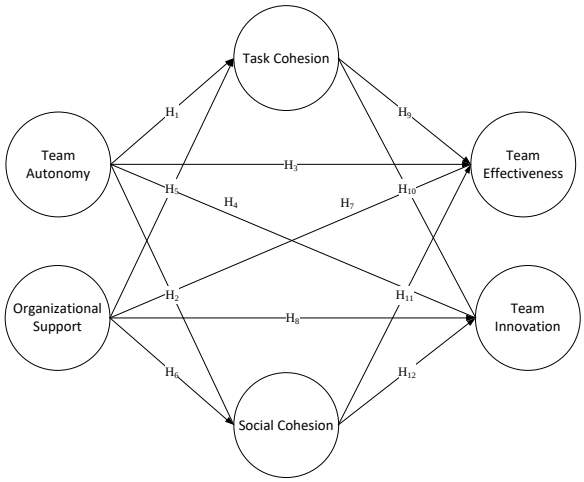

Figure 1. Proposed Research Model

Table 2 shows the hypotheses of the study.

Table 2. Hypotheses of the study

H_1 : There is a positive relationship between team autonomy and task cohesion.
H_2 : There is a positive relationship between team autonomy and social cohesion.
H_3 : There is a positive relationship between team autonomy and team effectiveness
H_4 :There is a positive relationship between team autonomy and team innovation
H_5 : There is a positive relationship between perceived organizational support and task cohesion.
H_6 : There is a positive relationship between perceived organizational support and social cohesion.
H_7 : There is a positive relationship between perceived organizational support and team effectiveness
H_8 There is a positive relationship between perceived organizational support and team innovation
H_9 : There is a positive relationship between task cohesion and team effectiveness.
H_{10} : There is a positive relationship between task cohesion and team innovation.
H_{11} : There is a positive relationship between social cohesion and team effectiveness
H_{12} : There is a positive relationship between social cohesion and team innovation
H_{13} :Task cohesion mediates the relationship between team autonomy and team effectiveness.
H_{14} :Social cohesion mediates the relationship between team autonomy and team effectiveness.
H_{15} :Task cohesion mediates the relationship between team autonomy and team innovation.
H_{16} :Social cohesion mediates the relationship between team autonomy and team innovation.

H_{17}:Task cohesion mediates the relationship between organizational support and team effectiveness.
H_{18}:Social cohesion mediates the relationship between organizational support and team effectiveness
H_{19}:Task cohesion mediates the relationship between organizational support and team innovation.
H_{20}:Social cohesion mediates the relationship between organizational support and team innovation.

9. Measures and Sampling

The sample of the study consists project teams that have completed projects in a multinational bank located in Istanbul. During the data sampling process, first the list of projects completed in 2016-2017 and the team members being involved in each project were obtained from project management office. The initial sample consisted of 566 employees within 180 project teams. An e-mail was sent to each project team, explaining the scope and aim of the study. The participants were informed that all responses would be anonymous and there were no right or wrong answers. The questionnaire items were also included. Data were collected through several waves of mail surveys between January 30, 2017- January 30, 2018. At least two respondents from each project were asked to complete the survey to avoid single-source bias. A total of 343 usable questionnaires from 110 project teams were collected. Multi item scales from previous studies for the measurement of variables were adopted to test the hypotheses. 5-point Likert scales ranging from 1: Strongly Disagree, 2: Disagree, 3: Undecided, 4: Agree, 5: Strongly Agree was used. The appendix includes the measures used. The measures are briefly explained below;

For team autonomy, four question items from Akgün, Keskin, Lynn and Dogan (2012) were asked and they were adapted from Sethi (2000). Seven question items drawn from Cramm, Strating, Bal and Nieboer (2013), were used to assess organizational support (original measure from Strating et al., 2008). For measuring the two dimensions of team cohesion (social and task), eight question items were taken from Hirunyawipada, Paswan and Blankson (2015). Its original scale was developed by Carless and De Paola (2000). Finally, for project team success, the model includes two dimensions, effectiveness and innovation. There are totally twelve question items drawn from Liu and Cross (2016), of which eight question items measure effectiveness dimension and four items measure innovation dimension. Though, in this study, efficiency was also measured as an indicator of project team success, considering the similar characteristics of effectiveness and efficiency scales, the efficiency scale of the primary measures of project team success was eliminated. The effectiveness scale was developed by Hoegl and Gemuenden (2001) whereas the innovation scale was developed by Liu and Cross (2016).

10. Analysis and Results

10.1. Measure Validity and Reliability

As the questionnaires were translated to Turkish for the first time, exploratory factor analysis was performed first. The principle component analysis was chosen in the SPSS 22 program. Varimax rotation with Kaiser normalization was applied, choosing eigenvalue 1 as cut-off point. Factor loadings lower than 0,5 were eliminated (Akgün and Lynn, 2002, p. 271). At the end, all factor loadings are formed between 0,515 and 0.848, which is over 0.5 and the KMO measure of sampling adequacy is 0,911> 0,70 and the Bartlett test of sphericity is $p < 0.000$ ($\chi 2$ (378) = 5730,857), which is statistically significant, indicating that the data set is appropriate for the next step of the analysis. The factor loadings are demonstrated in Table 3.

Confirmatory factor analysis was used to test for convergent validity. Using the AMOS 22 program, confirmatory factor model was established for the 28 items remaining after exploaratory factor analysis. After problematic questions were removed from the scale in the first run, confirmatory factor analysis was repeated.

Model fit indices were checked. Absolute fit indices indicates the extent of fit of the proposed theory to the data (McDonald and Ho, 2002). According to Jöreskog and Sörbom (1993), the calculation doesn't rely on comparison with a base model. Chi-Square test, GFI, AGFI, RMSEA, RMR and SRMR are among common absolute fit indices. According to Hu and Bentler (1999), chi-square value is a long-established measure to evaluate model fit and evaluates the size of variance between the sample and fitted covariance matrices. There are limitations for using chi-

square value, eg. assumption of normality (McIntosh, 2006), sensitivity to sample size (Bentler and Bonnet, 1980; Jöreskog and Sörbom, 1993). Due to the limitations of Chi-Square test, different indices were hunted for model fit. Wheaton et al's (1977) relative/normed chi-square ($\chi 2/df$) is an example of a statistic that reduces the effects of sample size. There is no agreed range for ($\chi 2/df$) ratios, Wheaton et. al. (1977) recommend a maximum ratio up to 5.0, whereas Tabachnick and Fidell (2007) recommend a ratio as low as 2.0. Regarding RMSEA, recent studies indicate that a cut-off value close to 0.06 (Hu and Bentler, 1999) or a strict upper limit of 0.07 (Steiger, 2007) are the agreed values by authorities in this field (Hooper, Coughlan and Mullen, 2008, pp. 53-54).

In addition, though sensitive to sample size, GFI and AGFI are also reported in covariance structure analyses given their historical importance. Marsh & Grayson (1995) and Schumacker & Lomax (1996) mention that GFI values above 0.9 can be interpreted as an acceptable fit, whereas for AGFI, values above 0.9 indicate a good fit and values above 0.85 may be considered as an acceptable fit. According to Anderson and Gerbing (1984), both indices decrease as the research model gets more complex especially for small sample sizes (Schermelleh-Engel et. al, 2003, pp. 40-43). SRMR values close to zero indicate a good fit (Hu and Bentler, 1998), less than 0,05 suggest a good fit (Hu and Bentler, 1995), whereas SRMR values below 0,1 indicate an acceptable fit (Schermelleh-Engel et. al, 2003, p. 38).

Incremental fit indices don't use the chi-square in its raw form instead they compare the chi-square value to a baseline model. According to McDonald and Ho (2002), the null hypothesis proposes that there is no correlation among the variables in these models. Usually, the incremental indices NFI and NNFI (TLI), CFI are reported in the literature. NFI ranges between 0 and 1 and Bentler and Bonnet (1980) recommend values above 0.90 for a good fit. Hu and Bentler (1999) state that the cut-off point should be 0.95 for NFI. For NNFI, a cut-off point as low as 0.80 has been proposed as acceptable in the previous literature, but Hu and Bentler (1999) have proposed NNFI $\geq$ 0.95 as the threshold. Again for CFI, according to Hu and Bentler (1999), a threshold of 0.90 is accepted initially for eliminating the possibility of accepting misspecified models, in the current studies a value above 0.95 indicates a good fit (Hooper, Coughlan and Mullen, 2008, p. 55).
The fit indices for the final confirmatory factor model proves that the model has acceptable fit values ($\chi 2/df$ = 2,213, GFI = 0.88, AGFI = 0.85, RMSEA = 0.060, RMR = 0.035, SRMR= 0.053, NFI= 0.89, NNFI (TLI) = 0.93, CFI = 0.94).
Table 4 shows the standard factor loads to the variables as a result of confirmatory factor analysis. As stated by Chin (1988), the standard factor loads were checked and found to be over the value of 0.6 and as indicated by Fornell and Larcker (1981) the calculated AVE values were over 0.5 (Akgün, Keskin and Byrne, 2010, p. 1103) (Table 5) In this context, it can be concluded that the convergence validity of the measurement model is reached.
At the next step, the discriminant validity of the measurement model was tested. Among the variables, low to moderate correlations show evidence of discriminant validity (Akgün et.al., 2006, p. 103). According to Fornell and Larcker (1981), in order to confirm discriminant validity, the square root of the the mean variance (AVE) of a variable must exceed the latent correlation coefficients between that specific variable and the other variables in the model. As indicated in Table 5, in this study, correlations between any of the variables is lower than the square root of the mean variance (AVE) of the variables, providing evidence of discriminant validity (Akgün, et.al. 2016, pp. 112-113) (see Table 5).
After performing the scale validity tests, reliability analysis was conducted to test whether the questionnaire items were interrelated, consistent, understandable and sufficient in terms of quantity and quality that could reveal the accuracy of the research conducted. The Cronbach alpha value (α) is between 0 and 1, whereas values closer to 1 mean that the scale is more reliable. As shown in Table 5, Cronbach's alpha for each construct is equal or greater than 0.7, which shows good reliability as suggested by Nunnally's (1978) study (Liu and Cross, 2016, p. 1158).

Table 3. Exploratory Factor Analysis Results

Variable	Item	Autonomy	Organizational Support	Task Cohesion	Social Cohesion	Effectiveness	Innovation
Autonomy	O1	0.80					
	O2	0.79					
	O3	0.78					
	O4	0.67					
Organizational Support	D1		0.78				
	D2		0.79				
	D3		0.78				
	D4		0.58				
	D5		0.59				
	D7		0.52				
Task Cohesion	GD2			0.74			
	GD3			0.79			
	GD4			0.75			
Social Cohesion	SD1				0.65		
	SD2				0.82		
	SD3				0.76		
	SD4				0.78		
Effectiveness	E1					0.73	
	E2					0.78	
	E3					0.80	
	E4					0.75	
	E5					0.73	
	E6					0.79	
	E7					0.70	
Innovation	I1						0.71
	I2						0.80
	I3						0.82
	I4						0.85

10.2. Aggregation of the Measures at Team Level

Since the unit of analysis is "project team" and each team is comprising at least two team members, the individual responses were aggregated at the team level by calculating arithmetic means before testing the hypotheses. In this context, the inter-rater agreement (rwg) values of the team-level measures were calculated; the calculated rwg values ranged between 0,88 and 0,97. Since these values are above the threshold value of 0.60 (Hurley and Hult, 1998), a satisfactory inter-rater agreement level is provided for each measurement clustered in the project teams. The calculated inter-rater agreement values are given in Table 5 together with the Cronbach's α and the average variance values (Akgün, Keskin and Byrne, 2010, p. 1103).

Table 4. Confirmatory Factor Analysis Results

Item	Variable	Unstandardized Regression Weights	Standardized Regression Weights	Standard Error	T-Value (Critical Ratio)	P-value
O1	Autonomy	1,00	0,83			

O2		0,97	0,88	0,05	18,54	0,00
O3		0,77	0,68	0,06	13,39	0,00
O4		0,83	0,77	0,05	15,72	0,00
D3	Organizational Support	1,08	0,68	0,09	11,46	0,00
D4		1,28	0,88	0,09	14,26	0,00
D5		1,25	0,83	0,09	13,63	0,00
D7		1,00	0,69			0,00
GD2	Task Cohesion	1,00	0,82			0,00
GD3		0,95	0,78	0,07	14,44	0,00
GD4		0,85	0,73	0,06	13,52	0,00
SD2	Social Cohesion	1,00	0,71			0,00
SD3		1,06	0,76	0,10	10,48	0,00
SD4		1,04	0,72	0,10	10,39	0,00
E1	Effectiveness	1,00	0,79			0,00
E2		1,01	0,84	0,06	17,42	0,00
E3		1,06	0,87	0,06	18,21	0,00
E4		0,95	0,77	0,06	15,63	0,00
E5		1,05	0,82	0,06	16,93	0,00
E6		0,95	0,79	0,06	16,18	0,00
E7		1,05	0,71	0,08	14,08	0,00
I1	Innovation	1,00	0,74			0,00
I2		1,15	0,77	0,09	13,44	0,00
I3		1,22	0,77	0,09	13,40	0,00
I4		1,20	0,82	0,08	14,29	0,00

Table 5. Descriptive Statistics, Correlation Coefficients and Reliability Results

	Avg.	**Std. Dev**	**1**	**2**	**3**	**4**	**5**	**6**
1 Autonomy	3,87	0,67	*(0,79)*					
2. Organizational Support	3,92	0,64	0,65	*(0,77)*				
3. Task Cohesion	3,90	0,74	0,47	0,63	*(0,78)*			
4. Social Cohesion	3,19	0,79	0,05	0,13	0,36	(0,73)		
5. Effectiveness	3,94	0,63	0,60	0,71	0,63	0,19	*(0,80)*	
6. Innovation	3,63	0,73	0,38	0,38	0,31	0,17	0,49	*(0,78)*
AVE			*0,63*	*0,60*	*0,61*	*0,53*	*0,64*	*0,60*
Cronbach's α			*0,87*	*0,85*	*0,82*	*0,77*	*0,92*	*0,86*
r_{wg}			*0,93*	*0,94*	*0,88*	*0,93*	*0,97*	*0,92*

Note: Values in parentheses show the square root of the AVE value.

10.3 Hypothesis Testing

To test our hypotheses, Smart-PLS 3.0 (Ringle, Wende and Becker, 2015) with the boot-strapping resampling method was used. According to Fornell and Bookstein (1982) and Hair et. al (2006), PLS does not require the restrictive assumptions that maximum likelihood techniques have, prevents factor indeterminacy and inappropriate solutions. Parametric distribution is not required and sample size does not have any effect on the solution, this makes small and large samples easier to use than structural equation modeling (Akgün et.al., 2014, pp. 41-42). Since the sample size is small (110 project teams) for covariance based SEM technique in AMOS and the sample does not show a normal distribution, PLS-SEM was implemented.

Smart-PLS 3.0 with bootstrapping re-sampling methods were used for hypothesis testing. Within Smart-PLS 3.0, 5000 sub-samples were drawn from the original data by randomly selecting sub-samples, with replacements. Path coefficients were calculated for each sub-sample and t-statistics were calculated for all coefficients checking the stability across the sub-samples to detect the statistically significant relations. The path coefficients and t-statistics demonstrated which relationships are significant (Akgün, Keskin and Byrne, 2010, p. 1104).

The research findings revealed that team autonomy has a positive effect on team effectiveness. Hypothesis 3 was found statistically significant at %95 confidence level, but the relationship between team autonomy and team innovation as predicted in Hypothesis 4 was found to be significant at %90 confidence level. Also, organizational support was positively related with team task cohesion and team effectiveness. Hypothesis 5 and Hypothesis 7 were supported with a high level of statistical significance at %99 confidence level. Again, Hypothesis 9 was supported indicating that team task cohesion had a significant positive effect on team effectiveness with a high level of statistical significance at %99 confidence level. On the other hand, the relationship between team task cohesion and team innovation as proposed in Hypothesis 10 was found to be significant at %90 confidence level. Other relations predicted in the research model were not statistically significant.

Table 6 shows hypothesized relationships, including beta coefficients and significance levels.

Table 6. Hypothesis Testing Results

Hypothesis	Relation	β	t-statistic	p-value	Result
H1	O→GD	0.103	0,982	0,326	Not Supported
H2	O→SD	-0.088	0,381	0,703	Not Supported
H3	O→E	0.203**	2,113	0,035	**Supported**
H4	O→I	0.208*	1,915	0,055	**Supported**
H5	OD→GD	0.566***	5,652	0,000	**Supported**
H6	OD→SD	0.179	0,795	0,427	Not Supported
H7	OD→E	0.430***	4,848	0,000	**Supported**
H8	OD→I	0.193	1,367	0,172	Not Supported
H9	GD→E	0.293***	4,304	0,000	**Supported**
H10	GD→I	0.170*	1,734	0,083	**Supported**
H11	SD→E	0.035	0,401	0,689	Not Supported
H12	SD→I	0.112	1,136	0,256	Not Supported

Note: O = Team Autonomy, GD = Task Cohesion, SD = Social Cohesion, OD = Organizational Support, E = Team Effectiveness, I = Team Innovation

*p < .10, ** p < .05, *** p < .01

10.4. Mediation Analysis

Also, the mediating effect (see Figure 2) of team cohesion dimensions on the relationship between the antecedent variables (team autonomy and organizational support) and the outcome variables (team effectiveness and team innovation) were investigated.

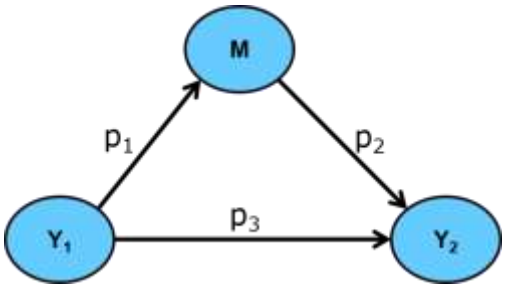

Figure 2- Simple mediator model (Source: https://www.smartpls.com/documentation/algorithms-and-techniques/mediation)

The below algorithm proposed by Zhao, Lynch Jr. and Chen (2010, p. 201) was implemented to decide on the presence and type of mediation.

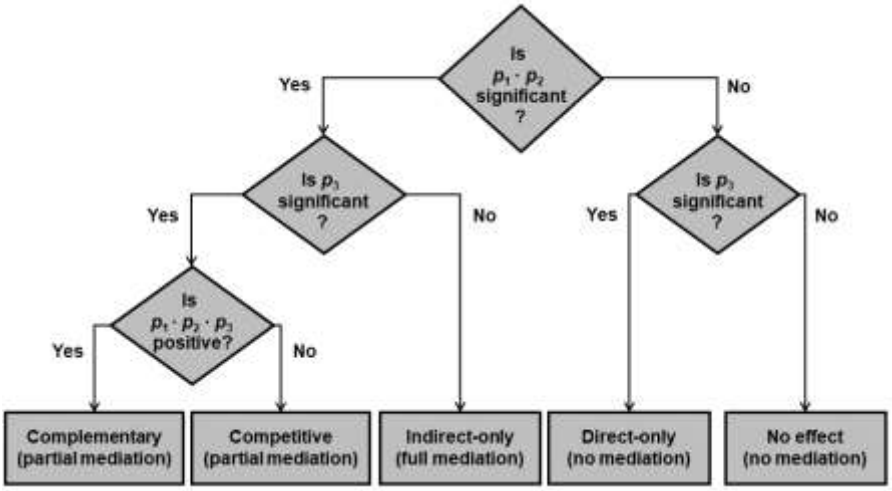

Figure 3- Mediation algorithm by Zhao, Lynch Jr. and Chen (2010) and Hair et. al. (2017) (Source:https://www.smartpls.com/documentation/algorithms-and-techniques/mediation)

As proposed by Zhao, Lynch Jr. and Chen (2010), in the analysis of the mediation effect of the team cohesion dimensions, first, the significance level of the indirect effects of the independent variables and the outcome variables were evaluated through the Smartpls3 program. The results of the analysis of hypothesized indirect relationships are shown in Table 7, including beta coefficient values (β) and significance levels.

Table 7. Mediating Effect Analysis Results

Hypothesis	Relation	B	t-statistic	p-value	Result
H13	O→GD→E	0,031	0,934	0,351	Not Supported
H14	O→SD→E	-0,006	0,137	0,891	Not Supported
H15	O→GD→I	0,018	0,777	0,437	Not Supported
H16	O→SD→I	-0,011	0,318	0,750	Not Supported
H17	OD→GD→E	0,165	3,590	0,000	**Supported**
H18	OD→SD→E	0,008	0,248	0,804	Not Supported
H19	OD→GD→I	0,097	1,576	0,115	Not Supported
H20	OD-->SD→I	0,022	0,607	0,544	Not Supported

Note: O = Team Autonomy, GD = Task Cohesion, SD = Social Cohesion, OD = Organizational Support, E = Team Effectiveness, I = Team Innovation

The results of the analysis showed that organizational support had a statistically significant indirect effect on team effectiveness through team task cohesion (p1.p2 is significant). As the direct relationship between organizational support and team effectiveness was also found to be statistically significant (p3 is significant) and the sign of p1.p2.p3 was positive, it was concluded that task cohesion had complementary partial mediation role in the relationship between organizational support and team effectiveness (Zhao, Lynch Jr. and Chen, 2010; Hair et. al., 2017). Therefore, only Hypothesis 17 was supported for partial mediation.

10.5. Model Fit

Since there is not any generally accepted goodness-of-fit measure for PLS-SEM models, the PLS structural model was validated by the coefficient of determination R^2 and Stone-Geisser coefficient of predictive relevance coefficient (Q2). The R^2 of the endogenous variables was calculated to assess the model fit (see Table 8). According to Hair et al. (2011, p.145), R^2 values of 0.75, 0.50 or 0.25 for endogenous latent variables are defined as substantial, moderate and weak respectively. According to Stone (1974) and Geisser (1974), in addition to the coefficient of determination R2, the predictive sample reuse technique (Q2) can be used as a criteria for measuring predictive relevance. Q2 evaluates the predictive validity of a structural model using PLS based on blindfolding procedure,. Q^2 values greater than zero for endogenous variables indicate predictive relevance (Hair, 2011, p. 147; Aydın, 2016, p. 100) (see Table 8).

Table 8. Explanatory Power of the Structural Model (R^2)

Variables	R^2	R^2 Adjusted
Effectiveness	0,728	0,718
Task Cohesion	0,502	0,493
Innovation	0,310	0,284
Social Cohesion	0,013	-0,005

Regarding the explanatory power of the structural model, it was observed that the antecedent variables could explain 50.2% ($R^2 = 0.502$) of the variance of task cohesion. However, the proposed model could not explain the variance of the social cohesion ($R^2 = 0.013$). It was also found that the variance of team effectiveness could be explained by 72.8% ($R^2 = 0.728$) and the variance of team innovation could be explained by 31% ($R^2 = 0.31$).

Table 9. Predictive Relevance of the Structural Model (Q^2)

Variables	SSO	SSE	Q^2 (=1-SSE/SSO)
Organizational Support	440,000	440,000	
Effectiveness	770,000	391,867	0,491
Task Cohesion	330,000	228,203	0,308
Innovation	440,000	367,875	0,164
Autonomy	440,000	440,000	
Social Cohesion	330,000	336,999	-0,021

In the proposed structural model, the Stone-Geisser's Q^2 value for effectiveness, task cohesion and innovation variables are greater than zero. In this context, the model has predictive relevance for these variables.

11. Discussion and Implementation

This study shows the asymmetric effects of team cohesion dimensions on project team outcomes in line with the previous literature (Bahli and Büyükkurt, 2005; Mullen and Copper, 1994; Carless and Paola, 2000; Hirunyawipada, Paswan and Blankson, 2015). Task cohesion had a significant impact on team effectiveness, whereas the effect of social cohesion was insignificant. The results demonstrated that teams focusing on a shared set of goals and committed to perform project tasks in harmony with the other team members, had the tendency to perform better than teams that only socialised. In addition, though to a limited degree, task cohesion also effected innovation, but social cohesion did not. This finding supports the previous suggestions of many authors (i.e. Hirunyawipada, Paswan and Blankson, 2015).

Second, this study highlighted the importance of organizational support in success or failure of the projects (Gelbard and Carmeli, 2009; Ehrhardt, 2014). Organizational support was found to be the variable having the greatest effect on team task cohesion and team effectiveness. This finding is in line with Ehrhardt's (2014) study that investigated similar variables in light of signaling theory and found the significant effects of perceived project support on project committment and project committment on project success successively. There were no significant effects of organizational support on team social cohesion and team innovation as a result of our study.

The other team supporting factor, autonomy was revealed to have positive effects on project team success for both dimensions of effectiveness and innovation. The findings are consistent with the study of Kirkman & Rosen (1999, p. 70) who concluded that teams should be highly effective to be autonomous. In addition, the results also support the studies of Carmen et.al. (2006) and Amabile et.al. (1996) who declare that team autonomy has a direct effect on innovation performance.

Though, the effect of autonomy on project team success was confirmed in line with the previous research, opposite to our expectations and the prevalent literature, no significant effects of team autonomy on team cohesion dimensions were found. Langfred (2000) found that team autonomy positively effected team cohesion for a social service agency, but no relation was found between these variables in a sample from Danish military. These findings refer that the relation between autonomy and cohesiveness can vary according to the culture of the organization, task design, task interdependence, functioning of the entity. Financial institutions are functional and hierarchical organizations and this study was conducted in a financial institution. The sample project teams examined mainly had cross-functional nature, where the team members were strongly binded to main departments. This might have prevented teams to earn cohesiveness, though they were granted autonomy.

Lastly, this study empirically demonstrated that team task cohesion partially mediated the relation between organizational support and team effectiveness. The results showed that task cohesion was the only variable which had a mediating effect in the model. The previous research supported the mediator role of cohesion between similar variables, etc. team member trust to senior management/coach and performance (Mach et.al., 2010), intra-team environment and effectiveness (Daspit et.al, 2013), team trust and effectiveness (DeOrtentiis et.al., 2013).

12. Limitations and Future Research

There are many limitations in this study. The sample size and scope are limited, only a sample of 110 project teams could be collected from one financial institution, so the readers should be attentive to generalize the results to different contexts. A limited number of variables are included in the research model. Factors affecting project team success are numerous. Also, this study, as a cross-sectional study, is limited to identify and confirm causal relationships. The future researches should include longitudinal data to test causal relationships. Finally, as mentioned by Hair et al. (2006), the analysis technique PLS-SEM is mainly based on prediction and does not come up with a test of theoretical fit (Akgün et. al., 2014, p. 44).

13. Conclusion

As successsful implementation of innovative projects is a requirement for growth and sustainability of businesses in knowledge intensive industries, companies need to enhance projects and project teams to achieve better outcomes. Previous research has demonstrated several factors that can foster project outcomes. In this study, we investigated the role of enabler variables, organizational support and team autonomy on team cohesion and the impact of team cohesion dimensions on project outcomes. Our results confirmed that autonomy and the task cohesion dimension of cohesiveness have significant effects on innovation and effectiveness. Also, organizational support has a positive effect on team task cohesion and team effectiveness. In addition, our results demonstrated that task cohesion has a partial mediating effect in the relationship between organizational support and team effectiveness.

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