Clinical and Experimental Psychology

Jacobsson and Wilmar, Clin Exp Psychol 2019, 5:2

Research Article Open Access

Group Processes – The Links between Team Climate Inventory and Group Development Questionnaire

Christian Jacobsson* and Maria Wramsten Wilmar

Department of Psychology, University of Gothenburg, Gothenburg, Sweden

Abstract

The present study analyzed the relationship between two models for effective team work, team climate theory and integrated model of group development, measured by TCI and GDQ. 72 members of 9 Swedish management teams answered the short version of Team Climate Inventory, TCI-14, and Group Development Questionnaire, GDQ. The response rate was 100% since the researchers met the managers on their regular team meetings. It was expected that there would be a close relationship between the two ways of describing effective team work, which was confirmed by the results. There were a very close relationship between the GDQ and TCI scales, 3 out of 16 correlations had a medium effect size (-0.40 to -0.43) and 13 had a large effect size (0.51 to 0.76). The strongest relationship between the two models was displayed between participative safety in TCI and the four scales of GDQ, indicating that participative safety is low in stage I and high in stage IV of the integrated model of group developments.

Keywords: Group processes; Effective team work; Team Climate Inventory (TCI); Group Development Questionnaire (GDQ)

Introduction

The overall purpose of this study is to examine the psychometrical relationship between two different ways of measuring group processes in work groups, Team Climate Inventory (TCI) by Anderson and West [1] and Group Development Questionnaire (GDQ) by Wheelan and Hochberger [2]. Within the framework of the Input-Process-Output model (IPO), suggested by McGrath [3] over 50 years ago, both models that the two questionnaires are based on attempts to cover the process part. The IPO model states that group processes, such as levels of cohesion or commitment, mediates the relationship between input and output [4]. Input variables create the circumstances for a group and are antecedents to processes, for instance composition of group members or the size of the group. Output variables are the consequences or achievements of the group's process, such as task performance or members' satisfaction.

Group Processes

Group processes refers to activities that group members engage in, combining their resources to try to resolve task demands. As mentioned, processes mediate the translation of inputs to outputs. Even though group processes are dynamic, they are often addressed in more static terms-as constructs that emerge over time (i.e. emergent states) as team members interact and the group develops [5]. The studied models in this paper are two examples of emergent states in groups, team climate and development stages in work groups. A work group is according to Kozlowski and Ilgen [5] composed of two or more individuals who exist to perform organizationally relevant tasks, share one or more common goals and exhibit task interdependencies (i.e. workflow, goals, knowledge, and outcomes). Furthermore, they interact socially, maintain and manage boundaries, and are embedded in an organizational context. Both Team climate model [1,6-9] and Integrated model of group development [10-14] has been widely used in research. However, no study has yet compared the two models psychometrically, which is the purpose of the present study. Both models have validated questionnaires linked to the models, Team Climate Inventory (TCI) [15] and Group Development Questionnaire (GDQ) [2] that will be used.

The team climate model

The social climate construct has a long tradition of research in organizational psychology, as a description of patterns of behaviors in groups. For instance, it was the independent variable when Lewin and colleagues studied the effects of democratic, authoritarian and laissez-fair leadership [16]. Anderson and West [15] based the construct of team climate on concepts of shared perceptions and organizational climate. Basaglia et al. [17] defined team climate as shared perceptions of the kinds of behaviors, practices, and procedures that are supported within a team. Extensive research into group climate and innovation, led Anderson and West [15] to develop a four-factor model of team climate for innovation.

The first factor, Vision, is the idea of a valued direction which represents a higher-order goal that motivates the team [15]. The second factor, Participative safety, refers to the degree to which team members feel comfortable sharing ideas as well as giving and receiving feedback within the team. Note that this construct may largely be equated with Edmonson's [18] concept of "psychological safety". The third factor, Task orientation, is a shared concern for excellence in task performance characterized by evaluation, critical appraisals, and modifications [15]. Finally, the fourth factor, Support for innovation is the expectation, approval, and support for the introduction of new and improved ways of doing things according to Anderson and West [15].

The integrated model of group development

The Integrated Model of Group Development (IMGD) is an integration of earlier theories and research on team development through stages across time, for instance Bennis and Shepard [19], Bales

***Corresponding author:** Christian Jacobsson, Department of Psychology, University of Gothenburg, Gothenburg, Sweden, Tel: + 46 31784396; E-mail: christian.jacobsson@psy.gu.se

Received: June10, 2019; **Accepted:** June 25, 2019; **Published:** July 02, 2019

Citation: Jacobsson C, Wilmar MW (2019) Group Processes–The Links between Team Climate Inventory and Group Development Questionnaire. Clin Exp Psychol 5: 210.

Copyright: © 2019 Jacobsson C, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

[20] and Tuckman and Jensen [21]. Also later theories, such as team compilation model [22], captures the idea that teams develop through stages (i.e. emergent states) with qualitative differences of relevance for team performance. The validity of the IMGD with regard to teams' performance has been established in a number of studies [2,23,24]. IMGD is a model describing four stages of group development. The stages are (I) Dependency and inclusion, (II) Counter-dependency and fight, (III) Trust and structure, and (IV) Work and productivity.

The first stage is characterized by team member dependency on the leader, safety concerns, and inclusion issues. Team members having opposing perspectives, counter-dependency towards the leader, and tensions in the team distinguish the second stage. The third stage is marked by increased trust and focus on structure and strategies for goal achievement in the team. Finally, the fourth stage is characterized by the intense focus of team members on achieving the goal(s). Stage IV groups have also established a team climate of openness and cohesion that facilitates effective work. Stage III and IV groups are more developed or more mature groups than Stage I and II, which also has been shown in research [10,13,14,23].

Research question and hypotheses

The overall research question is how is team climate theory, measured by TCI, and the integrated model of group development, measured by GDQ, connected? The assumption is that the two models are closely linked to each other and are two different ways of looking at the same phenomena; team behaviors that are more or less effective. More mature groups according to IMGD have established a team climate of openness and cohesion that facilitates effective work. Members are clear about goals and roles; they are highly task-oriented and highly cooperative. More mature and effective working groups will have high values on all four scales in TCI, indicating a positive and innovative team climate. With GDQ on the other hand, more mature and effective working groups will have low values on scale 1 and 2 that measures the occurrence of behaviors connected to the first two stages in the model and high values on scale 3 and 4, measuring behaviors linked to the last two stages. Hence, we state the hypotheses as follows.

Hypothesis 1: Vision in TCI has a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ.

Hypothesis 2: Participative safety in TCI has a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ.

Hypothesis 3: Task orientation in TCI has a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ.

Hypothesis 4: Support for innovation in TCI has a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ.

Method

Participants and context

In total, 72 individuals belonging to 9 management teams filled in and returned the questionnaire with GDQ and TCI, for a response rate of 100%. The high response rate could be explained by the fact that the researchers met all participants face-to-face at their management team meetings. 46 (71%) of the respondents where females, which is a normal proportion in human service organizations [25]. The size of the management teams varied from 4 to 13 members, with an average of 9 members. The participating management team members came from three types of human service organizations. They were leading elementary schools, municipal healthcare and health care organizations (Table 1).

Measures

Team Climate Inventory: TCI-14. The study used a Swedish translation of the short version of Team climate inventory [6,15], TCI-14 [26]. The short version comprises 14 items reflecting vision (4 items), participative safety (4 items), task orientation (3 items), and support for innovation (3 items). Sample item for vision is: To what extent do you think your team's objectives are clearly understood by other members of the team?, for participative safety: People feel understood and accepted by each other, for task orientation: Does the team critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome?, and for support for innovation: In this team we take the time needed to develop new ideas. The TCI has a 5-point response scale from 'strongly disagree' to 'strongly agree', in which higher scores indicate a better or more desirable team climate. Scale scores are based on the means of the included item scores ranging from 1 to 5. Cronbach's alpha for TCI-14 in a Swedish sample [6] was 0.84 for vision, 0.83 for participative safety, 0.84 for task orientation, and 0.81 for support for innovation.

Group development questionnaire: Group development was measured by the four 15-item scales of GDQ [2]. The scales are measuring the occurrence of more or less effective cooperation in teams and are validated as linked to the integrated model of group development. The Swedish translation of the original questionnaire items has been part of several studies [10,27,28]. Sample item for GDQ 1- dependency and inclusion is: Members tend to go along with whatever the leader suggests, for GDQ 2-counter-dependency and fight: There is quite a bit of tension in the group at this time, for GDQ 3-trust and structure: The group is able to form subgroups, or subcommittees, to work on specific tasks, and for GDQ 4-work and productivity: This group encourages high performance and quality work. Responses were given on a Likert-scale ranging from 1=never true for this group to 5=always true for this group. Results are reported as the sum of the 15 items on each scale, ranging from 15 to 75. Cronbach's alpha for scale 1 was 0.77, scale 2 0.90, scale 3 0.81, and scale 4 0.87 [27].

Analysis

Descriptive analyses and bi-variate correlations, product-moment r, analysis were conducted in IBM Statistics SPSS 24.

Results

Pearson correlations, means and standard deviations for the study variables are reported in Table 2.

The mean values on the four GDQ scales are at similar levels as mean values in Swedish norm data, where mean values are 37.2; 34.7; 53.5; 55.3 for GDQ scale 1 to 4. Also mean values on TCI is similar to earlier reported data on Swedish groups. Agrell and Gustafson [6] reported the mean values 3.87 for vision, 3.79 for participative safety, 3.42 for task orientation and 3.42 for support for innovation. Altogether this indicates that the sample in the present study is relatively comparable to other Swedish samples reported upon earlier.

Category of organization	N groups	N respondents
Municipal healthcare	3	18 (25%)
Elementary school	3	33 (46%)
Healthcare	3	21 (29%)
Total	9	72 (100%)

Table 1: Number of groups and respondents.

Scales	M	SD	Minimum	Maximum
Number of members per group	8.97	2.70	4	13
GDQ 1 Depend. & inclusion	36.58	7.73	20.00	49.00
GDQ 2 Counter-dep. & fight	32.50	7.46	16.00	48.00
GDQ 3 Trust & structure	52.83	7.12	38.00	70.00
GDQ 4 Work & productivity	53.91	7.21	36.00	70.00
TCI Vision	4.00	0.54	2.50	5.00
TCI Participative safety	3.93	0.66	1.75	5.00
TCI Task orientation	3.37	0.73	1.00	5.00
TCI Support for innovation	3.27	0.65	1.67	4.67

Table 2: Descriptive statistics of the study variables, N = 72.

Scales TCI GDQ	TCI Vision	TCI Partici-pative safety	TCI Task orientation	TCI Support for innov.
GDQ 1 Depend. & inclusion	-0.40**	-0.70**	-0.61**	-0.70**
GDQ 2 Counter-dep. & fight	-0.40**	-0.71**	-0.43**	-0.68**
GDQ 3 Trust & structure	0.51**	0.76**	0.68**	0.72**
GDQ 4 Work & productivity	0.60**	0.74**	0.68**	0.68**

Note: **= p<0.01

Table 3: Bi-variate correlations analysis of GDQ and TCI scales, N=72.

The results of the bi-variate correlations analysis is reported in Table 3.

The result shown in Table 3 supports the study hypotheses. Also worth noting, Cohen [29] suggests 0.10 to be a small effect size, 0.30 a medium and 0.50 a large effect size. Table 3 indicates a very close relationship between the GDQ and TCI scales, there are 3 correlations with medium effect size (-0.40 to -0.43) and 13 with large effect size (0.51 to 0.76).

Discussion

The overall research question was: how is team climate theory, measured by TCI, and the integrated model of group development, measured by the GDQ, connected? As shown in Table 3, the two models are closely related, which is not a surprise. More mature groups according to IMGD have established a team climate of shared goals, and a climate that promote participative safety. More mature groups are also task oriented and have a climate that supports for innovation according to Wheelan [30].

Vision in TCI had a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ. The effect sizes where medium to large [29], with correlations between -0.40 with GDQ 1 to 0.60 with GDQ scale 4, meaning that 36% (0.60^2) of the variance in GDQ 4 could be explained by the occurrence of shared goals in the teams. Or the other way around, 36% of the variance in vision could be explained by participants ratings on GDQ scale 4, work and productivity. Having shared goals in a group is often a part of the definition of a group in the first place [5]. Also, helping teams or groups to develop shared cognition with regard to goals seems to be one of the more effective interventions with regard to improving effectiveness [31].

Participative safety in TCI had a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ. The effect sizes where large [29], with correlations between -0.70 with GDQ 1 to 0.76 with GDQ scale 3, meaning that 58% (0.76^2) of the variance in GDQ 3 could be explained by the occurrence of participative safety in the teams. In the IMGD model, safety and inclusion is an emergent state that is low in stage I and high in stage IV [30]. The relationship to participative safety in the present study confirms this. The absolute strongest relationship between the two models is displayed here, between participative safety and the four scales of GDQ. The closely related construct Psychological safety has also been called the corner-stone of effective teamwork [32], meaning that safety is the most important emergent state in teams in order to develop effective cooperation.

Task orientation in TCI had a negative correlation to scale 1 and 2 and a positive correlation to scale 3 and 4 in the GDQ. The effect sizes where medium to large [29], with correlations between -0.61 with GDQ 1, over -0.43 with GDQ 2 to 0.68 with GDQ scale 3 and 4, meaning that 46% (0.68^2) of the variance in GDQ 3 and 4 could be explained by the occurrence of task orientation in the teams. Earlier research on IMGD has shown that stage I groups spend about 40% of available time working with a focus on their task at hand on meetings and stage IV groups about 80%. The remaining time is used for maintenance, and dealing with interpersonal issues that arise and the like [33]. A growing task orientation within the team is coupled to becoming more mature as a team, going from stage I to stage IV.

Support for innovation in TCI had also a clear relationship to the four GDQ scales, indicating that the more mature team work, the higher support for innovation. The effect sizes where large [29], with correlations between -0.70 with GDQ 1 to 0.72 with GDQ scale 3, meaning that 52% (0.72^2) of the variance in GDQ 3 could be explained by the occurrence of support for innovation, or the frequency of reported stage III behaviors could explain 52% of the variance with regard to support for innovation. Within the IMGD model encouragement of innovation is a part of stage III and IV behaviors in groups [30], something that increases as the group develops and becomes more mature.

Limitations

The present study was limited by its' relatively small sample with only 72 respondents belonging to 9 management groups. However, the relatively similarities between mean values for GDQ and TCI scales in the present study and earlier research on Swedish groups indicate that the sample is representative of groups in Swedish working life. Another possible limitation was that TCI and GDQ to some extent had quite similar items in the questionnaires, asking for the same thing [34,35]. High correlations could be expected solely from this fact. However, the purpose of the present paper was to study the relationship between two theoretical models of effective team work, measured by two validated questionnaires. It is reasonable that items are similar to some extent when the models and questionnaires are describing the same phenomena, effective team work, even though the models are different.

Conclusion

The present study analyzed the relationship between two models for effective team work, team climate theory and integrated model of group development, measured by TCI and GDQ. It was expected that there would be a close relationship between the two ways of describing effective team work, which also was confirmed by the results. The absolute strongest relationship between the two models was displayed between participative safety in TCI and the four scales of GDQ, participative safety is low in stage I and high in stage IV of the integrated model of group development.

Disclosure Statement

No potential conflict of interest was reported by the authors.

References

1. Anderson NR, West MA (1996) The Team Climate Inventory: Development of the TCI and its Applications in Teambuilding for Innovativeness. Eur J Work Organ Psychol 5: 53-66.
2. Wheelan SA, Hochberger JM (1996) Validation Studies of the Group Development Questionnaire. Small Group Res 27: 143-170.
3. McGrath JE (1964) Social psychology: a brief introduction. Holt, Reinhart & Winston, New York.
4. West MA, Anderson NR (1996) Innovation in top management teams. J Appl Psychol 81: 680-693.
5. Kozlowski SWJ, Ilgen DR (2006) Enhancing the Effectiveness of Work Groups and Teams. Psychol Sci Public Interest 7: 77-124.
6. Agrell A, Gustafson R (1994) The Team Climate Inventory (TCI) and group innovation: A psychometric test on a Swedish sample of work groups. J Occup Organ Psychol 67: 143.
7. Dackert I, Brenner SO, Johansson CR (2002) Team Climate Inventory with a Merged Organization. Psychol Rep 91: 651-656.
8. Kivimäki M, Vanhala A, Pentti J, Länsisalmi H, Virtanen M, et al. (2007) Team climate, intention to leave and turnover among hospital employees: Prospective cohort study. BMC Health Serv Res 7: 170-178.
9. Mathisen GE, Einarsen S, Jørstad K, Brønnick KS (2004) Climate for work group creativity and innovation: Norwegian validation of the team climate inventory (TCI). Scand J Psychol 45: 383-392.
10. Jacobsson C, Rydbo N, Börresen JE (2014) The Links Between Group Development and Health in Manufacturing Industry. Small Group Res 45: 400-415.
11. Ulhassan W, Westerlund H, Thor J, Sandahl C, von Thiele Schwarz U (2014) Does Lean implementation interact with group functioning? J Health Organ Manag 28: 196-213.
12. Wheelan SA, Davidson B, Tilin F (2003) Group Development Across Time: Reality or Illusion? Small Group Res 34: 223-241.
13. Wheelan SA, Tilin F (1999) The Relationship between Faculty Group Development and School Productivity. Small Group Res 30: 59-81.
14. Vigil S (2008) A longitudinal study of multidisciplinary engineering design teams using Wheelan's integrated model of group development. Ph.D. thesis, Univ. of Alabama in Huntsville.
15. Anderson NR, West MA (1998) Measuring climate for work group innovation: development and validation of the team climate inventory. J Organ Behav 19: 235-258.
16. Lewin K, Lippitt R, White RK (1939) Patterns of Aggressive Behavior in Experimentally Created "Social Climates". The Journal of Social Psychology 10: 269-299.
17. Basaglia S, Caporarello L, Magni M, Pennarola F (2010) IT knowledge integration capability and team performance: The role of team climate. Int J Information Management 30: 542-551.
18. Edmondson AC (1999) Psychological Safety and Learning Behavior in Work Teams. Adm Sci Q 44: 350-383.
19. Bennis WG, Shepard HA (1956) A theory of group development. Human Relations 9: 415-437.
20. Bales RF (1965) The Equilibrium Problem in Small Groups. In Hare AP, Borgatta EF, Bales RF (Eds.), Small Groups: Studies in Social Interaction. New York: Knopf. pp: 424-456
21. Tuckman BW, Jensen MAC (1977) Stages in Small Group Development Revisited. Group and Organizational Studies 2: 419-438.
22. Kozlowski S, Hully S, Nason E, Smith E, Ilgen D, et al. (1999) Developing adaptive teams: A theory of compilation and performance across levels and time. The changing nature of performance. Jossey-Bass Publishers, San Francisco.
23. Wheelan SA, Burchill CN, Tilin F (2003) The Link Between Teamwork and Patients' Outcomes in Intensive Care Units. Am J Crit Care 12: 527-534.
24. Wheelan SA, Mckeage RL (1993) Developmental Patterns in Small and Large Groups. Small Group Res 24: 60-83.
25. Hasenfeld Y (1983) Human service organizations. Englewood Cliffs, Prentice-Hall, NJ.
26. Kivimaki M, Elovainio M (1999) A short version of the Team Climate Inventory: Development and psychometric properties. J Occup Organ Psychol 72: 241-246.
27. Jacobsson C, Åkerlund M, Graci E, Cedstrand E, Archer T (2016) Teacher team effectiveness and teachers' wellbeing. Clin Exp Psychol 2: 130.
28. Wheelan SA, Jacobsson C (2014) A Descriptive Study of Work Groups in the Swedish and U.S. Economy. Paper presented at the the 9th GRASP conference, Linköping: Linköping University.
29. Cohen J (1992) A power primer. Psychol Bull 112: 155-159.
30. Wheelan SA (2005) Group processes: A developmental perspective (2nd ed.). Allyn & Bacon, Boston.
31. Klein C, DiazGranados D, Salas E, Le H, Burke CS, et al. (2009) Does Team Building Work? Small Group Res 40: 181-222.
32. Edmondson AC (2019) The fearless organization: creating psychological safety in the workplace for learning, innovation, and growth: Hoboken, Wiley, New Jersey.
33. Wheelan SA, Williams T (2003) Mapping Dynamic Interaction Patterns in Work Groups. Small Group Res 34: 443-467.
34. Wheelan SA (2003) An initial exploration of the internal dynamics of leadership teams. Consulting Psychology Journal: Practice and Research 55: 179-188.
35. Wheelan SA, Burchill CN (1999) Take Teamwork to New Heights. Nurs Manage 30: 28-31.