Compendium of Research Instruments

Instrument Title:

Team Climate Inventory™

Instrument Author:

Anderson, Neil R and West, Michael A

Source title:

Measuring climate for work group innovation: Development and validation of the Team Climate Inventory

Source:

Peer-reviewed journal article [note: seminal but not first publication on TCI by original authors]

Source Author:

Anderson, N.R/ and West, M.A.

Journal Name:

Journal of Organizational Behavior

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Abstract:

From source paper: This paper reports the development and psychometric validation of a multi-dimensional measure of facet-specific climate for innovation within groups at work: the Team Climate Inventory (TCI). Brief reviews of the organizational climate and work group innovation literatures are presented initially, and the need for measures of facet-specific climate at the level of the proximal work group asserted. The four-factor theory of facet-specific climate for innovation, which was derived from these reviews, is described, and the procedures used to operationalize this model into the original version measure described. Data attesting to underlying factor structure, internal homogeneity, predictive validity and factor replicability across groups of the summarized measure are presented. An initial sample of 155 individuals from 27 hospital management teams provided data for the exploratory factor analysis of this measure. Responses from 121 further groups in four occupations (35 primary health care teams, 42 social services teams, 20 psychiatric teams and 24 oil company teams; total N ˆ 971) were used to apply confirmatory factor analysis techniques. This five-factor, 38-item summarized version demonstrates robust psychometric properties, with acceptable levels of reliability and validity. Potential applications of this measure are described and the implication of these findings for the measurement of proximal work group climate are discussed. [NOTE: analysis and findings in this source paper (Anderson and West 1998, now called Version 1) predates analysis and findings published in earlier published papers(Anderson and West 1996, now called Version 2)- possibly reflecting the nature of the publication process].

Extensive reliability and validity tests of the TCI have been conducted using data from healthcare teams in around the world (Anderson and West 1996, Anderson and West 1998, Agrell and Gustafson 1994, Strating and Nieboer 2009, Dackert et al 2002, Ouwens et al 2008, and Hulsheger et al 2009). These tests demonstrated that the TCI has good reliability (subscale reliability correlations range from 0.73 to 0.95). Construct validity showed the five factor (vision, participative safety, support for innovation, task orientation, interaction frequency) and the four factor structure (participative safety and interaction frequency scales were combined) was robust resulting in a 38 item tool.

Although the TCI theoretical model consists of a four-factor solution, studies of factor structures and construct validity across cultures have yielded mixed results; thus, studies not only support the theoretical four-factor model of the TCI but also suggest that a fifth factor may be required to accommodate different cultures or job complexity (Hsu-Min et al 2009).

A fifth six-item scale, 'social desirability', was later added making a 44 item tool (Anderson and West 1996) however there has not been much substantial validity work published on the Social Desirability scale (Loo and Loewen 2002).

Both the 38-item and the 44-item version of the TCI have been translated into various languages, such as Swedish (Agrell & Gustafson, 1994), Finnish (Kivimaki, et al., 1997), Italian (Ragazzoni, Baiardi, Zotti, Anderson, & West, 2002), and Norwegian (Mathisen, et al., 2004), and Tawainese (Hsu-Min et al 2009). In addition, a 14-item short version has also been developed (Kivimaki, et al 1999), explored (Loo et al 2002, Strating and Nieboer 2009) and translated (Boada-Grau, et al 2011).

Descriptors:

Cooperative behavior, creativeness, work/psychology, innovation, workplace/psychology, leadership, teams in the workplace, team climate inventory, organizational behavior

Number of questions:

Version 1 (Anderson and West 1998)	38 items in 5 subscales (after psychometric analysis of original 61 item instrument in 4 subscales)
Version 2 (Anderson and West 1996)	44 items in 5 subscales (after 'social desirability' subscale added-see below)
Shortened version (Kivimaki 1999)	14 items in 4 subscales (derived from 38 item version)

Response Options:

Vision scale	All subscales: 7 point response scale ranging from 1= not at all to 7 = completely
Participative safety scale	Team participation subscale: 5 point response scale ranging from strongly disagree to strongly agree Safety subscale: 5 point response scale ranging from 1=a very little extent to 5=a very great extent
Support for innovation scale	All subscales: 5 point response scale ranging from 1 = strongly disagree to 5 = strongly agree
Task orientation scale	Climate for excellence subscale: 7 point response scale ranging from 1 = to a very little extent to 7 = to a very great extent Constructive controversy subscale: 5 point response scale ranging from 1 = strongly disagree to 5 = strongly agree
Interaction frequency scale[#]	Unable to extrapolate information on the response options for this scale; can assume it was one of the two mentioned under 'participative safety'
Social desirability scale[$]	Unable to locate information on the response options for this scale
[#]interaction frequency was the fifth scale in Version 1, but combined with participative safety in Version 2 [$]social desirability was the fifth scale in Version 2; participative safety and interaction frequency combined into one scale in Version 2	

Validity:

Version 1 (Anderson and West 1998) *See paper for full description of psychometric analyses*	Psychometric analyses undertaken as follows:	
	explanatory factor analysis (based on sample of 155 managers from the original 27 hospital teams)	Number of cases =155; KMO = .81 Bartlett test of sphericity significant at <.001; Ratio of cases 2.5:1; 5-factor solution with iteration and Varimax (orthogonal rotation) extracted 61.7% of the total variance.
	predictive validity (variance accounted for in independently rated team innovativeness by TCI results across the 27 hospital teams),	Support for innovation emerged as the only predictor of overall innovation, accounting for 46% of the variance; participative safety emerged as the best predictor of the number of innovations and team self-reports of innovativeness
	confirmatory factor analysis (based on independent sample of 121 teams from a variety of organizations)	CFA using AMOS performed to confirm five factor solution; TCI administered to 3 other samples of work groups (comprising 971 members from 121 teams). Five correlated factor model confirmed as most parsimonious, with TLI indices accounting for 96% of the variance (TLI=.96, x^2/df=1.96) but four-factor model only slightly less parsimonious (x^2/df=2.13)
Version 2 (Anderson and West 1996)	No further validity tests undertaken in this paper	n/a
Short version (Kivimaki 1999)	confirmatory factor analysis	Factor loadings consisted for 4-factor structure on 2 samples (n=1494 and n=771) and were statistically significant (p< .05). Sample 1: x^2 (71) =310.77, TLI=.96; Sample 2: x^2 (71) =212.77; TLA= .97.

Reliability:

Version 1 (Anderson and West 1998)	Alpha coefficient on 4 scales demonstrated acceptable reliability for all five factors; all scales were significantly and positively correlated ($p<.01$) .94 (vision) .89 (participative safety) .92 (support for innovation) .92 (task orientation) .84 (interaction frequency)	
Version 2 (Anderson and West 1996)	Alpha coefficient on 4 scales demonstrated acceptable reliability: .93 (vision) .91 (participative safety) .95 (support for innovation) .88 (task orientation) No reliability data on social desirability scale.	
Short version (Kivimaki 1999)	Cronbach's alpha for total short TCI= .91; acceptable reliability demonstrated on all 4 scales.	
	Sample 1 (n=1494) .84 (vision) .85 (participative safety) .86 (support for innovation) .79 (task orientation)	Sample 2 (n=771) .86 (vision) .85 (participative safety) .85 (support for innovation) .82 (task orientation)

Subscale/Factors:

Version 1 (Anderson and West 1998)	5 scales: vision (11 items), participative safety (8 items), support for innovation (8 items), task orientation (7 items), interaction frequency (4 items)
Version 2 (Anderson and West 1996)	5 scales: vision (11 items), participative safety (12 items), support for innovation (8 items), task orientation (7 items), social desirability (6 items)
Short version (Kivimaki 1999)	4 scales: vision (4 items), participative safety (4 items), support for innovation (3 items), task orientation (3 items)

Sample Descriptors:

Human, interprofessional, multidisciplinary, teams

Sample Items:

- How clear are you about what your team's objectives are? [vision scale]

- To what extent do you think other team members agree with these objectives? [vision scale]
- We share information generally in the team rather than keeping it to ourselves. [participative safety scale]
- Members of the team meet frequently to talk both formally and informally. [interaction frequency scale#]
- Team member provide practical support for new ideas and their application. [support for innovation scale]
- People in this team are always searching for fresh, new ideas. [support for innovation scale]
- Do you and your colleagues monitor each other so as to maintain a higher standard of work? [task orientation scale]
- Do members of the team build on each other's ideas in order to achieve the best possible outcome? [task orientation scale]
- People in the team never feel tense with one another [social desirability scale$]
- The team always functions to the best of its capability [social desirability scale$]

#interaction frequency was the fifth scale in Version 1, but combined with participative safety in Version 2

$social desirability was the fifth scale in Version 2; participative safety and interaction frequency combined into one scale in Version 2

Measure Descriptors:

Psychometrics, organizational culture, factor analysis, self-report

References:

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Readability Index:

Method used: Flesch-Kincaid (English).

From abstract (from source paper): Flesch-Kincaid Grade level: 21; Flesch-Kincaid Reading Ease score: -8.

From introduction (from source paper): Flesch-Kincaid Grade level: 17; Flesch-Kincaid Reading Ease score: 5.

Availability:

Publisher – PreVisor. TCI not found, but TCI-R is available for purchase from ACER Shop online https://shop.acer.edu.au/acer-shop/group/TCI/26. [Note: cannot locate any published papers or other information on TCI-R, nor on differences between 'TCI 'and 'TCI-R'].

At 1/Mar/2012- TCI-R starter kit price is $965.95 and includes materials to perform 25 administrations of the TCI. Note from distributor: "ACER tests are professionally developed assessment instruments that require specialised training to ensure appropriate and ethical use. Eligibility to purchase these tests, therefore, is restricted to individuals with specific training and experience in a relevant area of assessment. In order to purchase a restricted test or assessment tool you will need to register your qualifications with ACER. Tests purchased from ACER are for customer use only and are not to be resold" (ACER website).

The TCI-R has a qualification rating of "M" for 'moderate', which means it is "[a]vailable to professionals with tertiary qualifications in education, human resources, personnel administration, psychology or other relevant discipline, or demonstrated equivalent experience" (ACER website). Tests in this category require some technical knowledge of test construction, use, administration and feedback.

Acronym:

TCI

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