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Developing a Structural Equation Model of Organisational Performance and Employee Engagement

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Abstract

The paper explores the presence and interrelationship of seven higher-order work systems and outcomes. There is a surprising lack of empirical support for a higher-order structure of work systems, or even for the presence of multiple systems. The current study aimed to overcome past research limitations by examining a wider range of management practices with a psychometrically more robust tool. The Voice Climate Survey, an employee opinion survey, was completed by three independent samples involving a total of 10,021 employees across 876 business units from over 700 different organisations. Confirmatory factor analyses supported the presence of 31 lower-order factors and seven higher-order factors. The higher-order factors comprised five work systems - purpose, property, participation, people and peace - and two work outcomes - progress and passion (representing the construct of employee engagement). Through structural equation modeling the study suggests purpose, property and participation are strong predictors of organisational progress, and that purpose, participation and progress are strong predictors of employee passion. It is hoped that more rapid development of our understanding of organisational climate can be provoked by the presentation here of a higher-order model of work systems and outcomes, and a psychometrically strong tool that measures all model components.

Introduction

The primary aim of the study was to explore a structural equation model of how five work systems (purpose, property, participation, people and peace) may interact with each other and contribute to the work outcomes of progress and passion (mirroring the currently popular construct of 'engagement').

Work Practices & Systems

Huselid (1995) introduced the term *high performance work practices* in an attempt to direct research towards

examining which of the extremely broad range of possible work practices best predict organizational outcomes. A wide range of work practices have been consistently linked to various measures of organizational effectiveness (e.g., Patterson, West, Shackleton, Dawson, Lawthom, Maitlis, Robinson, & Wallace 2005; Paul & Anantharaman, 2003; Pfeffer, 1994; 1998; Von Glinow, Drost & Teagarden, 2002). The vast majority of past research, however, has examined such practices in isolation, which hinders our understanding of the *relative* efficacy of these management practices. Hence, there is a growing interest in studying multiple practices within a single study to enable direct comparisons of effect sizes (e.g., Huselid, 1995; Pfeffer, 1998).

Given the wide range of work practices that have been identified and studied, there is also a growing call for the investigation of a smaller set of higher-order categories that can be used to group work practices and enable comparison across studies (e.g., Huselid, 1995; Niehaus & Swiercz, 1996; Parker, Baltes, Young, Huff, Altmann Lacost & Roberts, 2003; Pfeffer, 1998; Tomer, 2001; van den Berg & Wilderom, 2004). Following Huselid, the current article uses the term *systems* to refer to the grouping of work practices. In a meta-analysis of measures of organizational climate, Parker et al. (2003, p. 389) stated there is a need "to find a means of categorizing the enormous number of psychological climate scales into a logical set of core categories". Similarly, van den Berg and Wilderom (2004, p. 573), in a recent review of the climate and culture literature, argued that "convergence on the [higher-order] dimensions is very much needed and may stimulate research, as is the case in the development of the Big Five personality traits". Identifying a simpler, higher-order set of systems may help integrate existing research and provide a language

and structure to coordinate future research into management practices.

Modeling Work Systems & Outcomes

All data for the model in the current paper came from an employee survey – the Voice Climate Survey. The survey measures 31 lower-order work practices that group together into seven higher-order factors representing five work systems (purpose, property, participation, people and peace) and two work outcomes (progress and passion).

In developing the model it was assumed that passion and progress would be the final outcomes in the model, and that progress would impact passion. All data for the model came from an employee survey, and hence the employee self-reported scores for passion are influenced by both the objective reality of an organization and employee interpretations and reports of that reality. Given employee passion is operationalised here as a cognitive and affective response to one's environment, it was believed that passion should be treated as a potential consequence of not just all five work systems but also a consequence of employee perceptions of progress. The author acknowledges that passion may in turn contribute to non-employee outcomes. However, given 1) structural equation modeling is largely limited to uni-directional paths between endogenous variables, and 2) that the data used for the model were based on employee perceptions, passion was assumed to be a consequence, and not an antecedent, of progress. Nevertheless, an alternative model with passion predicting progress is also tested.

Of the five work systems, the assumed hierarchy of these variables was (moving from upstream to downstream variables): purpose, property, participation, people and peace. Purpose (i.e., having a clear direction, mission and values) was treated as the only exogenous variable and allowed to predict all other work systems and outcomes. Without a purpose an organization does not begin or continue, and hence the author believed that all other work systems and outcomes were subordinate to the existence of a purpose. Similarly, without property (i.e., resources, technology and facilities) activities cannot be financed and people cannot be acquired; hence, property was subordinate to purpose and allowed to predict all other work practices and outcomes. With both purpose and property, participation (i.e., acquisition, involvement and development of staff) is possible which in turn impacts people (i.e., motivation and initiative, talent, and teamwork). The final work system – peace (i.e., wellness and work/life balance) – is regarded as a consequence of the nature of the purpose of the organization, having sufficient and appropriate property, experiencing the appropriate type and level of

participation and, most immediately, a result of the motivation, talent and teamwork of the people with whom one works. All of these five work systems were used to predict the outcomes of progress and passion.

One debatable component of the above hierarchy is that property is used to predict progress, when quite reasonably the economic benefits of organizational progress could be argued to enable the acquisition of more and better quality property. To address this concern, an alternative model with progress predicting property is also tested.

This hierarchical order of work systems and outcomes is shown in Figure 1, ordered from left-to-right and top-to-bottom. This paper presents a series of structural equation models, across independent samples of employees, first exploring and then confirming the possible causal relationships between these hierarchically ordered work systems and outcomes.

Method

Participants

Data were collected throughout 2002, 2003 and 2004 from 10,021 employees from 876 business units from approximately 700 organizations. The organizations were predominantly based in Australia although many were Australian operations of multinational corporations.

Measure

The Voice Climate Survey contains 102 items that load on 31 lower-level factors and seven higher-order factors. The relationship between lower-level factors and higher-level factors is shown in Figure 1. For a copy of the Voice Climate Survey and details of its psychometric properties contact the first author. In the present study the 31 lower-order factors within the survey showed an average alpha of .83, and the higher-order factors showed an average alpha of .91. Employees took an average of 15 minutes to complete the 102 items in the Voice Climate Survey. All answers were provided on a 5-point rating scale ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree", with an additional option of "Don't Know/Not Applicable" (responses to which were treated as missing).

Results

Table 1 shows the alphas, means, standard deviations and intercorrelations for all systems.

In order to examine the stability of the structural equation models across multiple independent samples the 10,021 employees who responded were split into three groups according to the year in which the data were collected – 2002, 2003 and 2004.

Using the 2002 subset, an exploratory approach to model development was used. Initially, all variables were allowed to predict all other variables downstream in the model.

The model shown in Figure 1 shows the paths with coefficients of .10 or greater using the 2002 data. The model was then replicated across the 2003 and 2004 subsets of data with little variation in path coefficients. Figure 1 shows the average path coefficients across the three subsets of data. Table 2 shows the path coefficients and goodness-of-fit indices for all subsets. Given the large sample, it is unsurprising that the chi-squared tests were significant. However, the CFI, NFI, TLI and RMSR were all strong.

To further evaluate the model in Figure 1, three alternative models were tested on the 2002 dataset. An alternative model with all paths reversed showed substantially worse fit statistics than the original model: a chi-squared value of 1354 (d.f. = 6, $p < .00$), a CFI of .89, a NFI of .89, a TLI of .62 and a standardized RMSR of .22.

A second alternative model had passion predicting progress rather than progress predicting passion. This model produced strong fit statistics that were only marginally worse than the original model: a chi-squared value of 116 (d.f. = 6, $p < .00$), equivalent CFI, NFI and TLI, and a slightly worse standardized RMSR of .03. Given these strong fit statistics a reciprocal path from passion to progress is included in Figure 1.

A third alternative model had progress predicting property rather than property predicting progress. Such a model can be logically justified given organizational progress may produce an economic surplus which can be used to enhance resources, facilities and technology. This model produced fit statistics matching those of the original model. Such results suggest this alternative model provides an equally reasonable explanation of the data, and hence a reciprocal path between progress and property has been included in Figure 1.

Discussion

These results converged with much previous research demonstrating the importance of traditional human resource management practices (such as rewards and recognition, recruitment and selection, involvement and developing leadership) for contributing to passion and progress. All such practices loaded on a single higher-order factor, here labeled as participation, which was one of the strongest predictors of work outcomes.

The present study was, however, able to extend previous research through the use of a tool that measured a broader range of practices and systems. For example, in addition to participation, both purpose and progress demonstrated similarly strong direct effects upon passion. Further, in addition to participation, both

purpose and property showed similarly strong direct effects upon progress in the structural equation model.

Of note in Figure 1 is the absence of direct paths between passion and the potential predictors of property, people and peace. Moreover, while property showed an indirect effect (through participation and progress) people and peace did not. Within these latter two systems, the work practices that showed the weakest relationships with passion were teamwork and work/life balance. These are fascinating findings given that both these constructs have received considerable academic, practitioner and media attention. One possible explanation may be that they have been studied largely in isolation previously and their relative importance has not been directly compared with other work practices. Both these practices show weak-to-moderate correlations with passion and, hence, if studied in isolation, would appear to explain variance in employee outcomes. However, when studied alongside other work practices as in the current study, their low relative importance is suggested. Further, they do not explain additional variance in employee outcomes beyond that explained by other work practices.

The model in Figure 1 can be used to explain the founding, growth and potential decline of an organization in the following manner. A critical first step in establishing an organization is the creation and communication of its purpose. To fulfill the purpose, property is acquired (e.g., through personal or public equity). Both purpose and property enable participation-related practices to be established (i.e., the acquisition, development and involvement of staff). Purpose, property and participation influence the people in an organization (e.g., by attracting people who want to work for a particular purpose, by providing the resources to attract a particular level of talent, and then developing them appropriately). In turn, people, property and, to a lesser extent, participation determine the level of peace (e.g., through the work styles and skills of co-workers affecting the level of conflict in a workplace, by having sufficient resources to manage workload, and perhaps by having sufficient involvement in decision-making). The purpose, property and participation within an organization directly impact progress (e.g., by setting a strong direction and values, by enabling the acquisition of the necessary capital, and developing, recognizing and involving employees). Finally, employees' level of passion is a direct result of their sense of purpose, the degree to which they feel they are participating in the organization, and the degree to which they see the organization making progress towards important outcomes. This heightened employee passion contributes further to progress, which in turn enables improvements in property to further fuel growth.

A virtuous circle can be seen here which, however, could become a vicious circle if a decline is seen in purpose (e.g., if the original consumer or social need has changed or been met through other means or if critical stakeholders no longer believe decisions within the organization are aligned with its purpose), property (e.g., if equity holders or funding bodies withhold or withdraw their funds), participation (e.g., if skillful

leaders leave or if the resourcing of human resource management practices is reduced), progress (e.g., if external market or economic conditions worsen), or passion (e.g., if rumours were to harm employee confidence in an organization such that they put in less effort and start looking for jobs elsewhere).

Table 1. Alphas, means, standard deviations and intercorrelations for systems.

System/Outcome	Alpha	Mean	SD	Purpose	Property	Participation	People	Peace	Progress
Purpose	.91	3.91	0.58						
Property	.91	3.63	0.65	.70					
Participation	.95	3.43	0.67	.76	.74				
People	.90	3.93	0.63	.54	.49	.50			
Peace	.87	3.86	0.68	.47	.50	.47	.47		
Progress	.91	3.74	0.68	.71	.69	.73	.49	.47	
Passion	.92	3.59	0.84	.63	.54	.65	.45	.38	.63

Table 2. Path coefficients, squared multiple correlations and fit statistics from structural equation models.

Path origin	Path destination	SEM 2002	SEM 2003	SEM 2004	Avg
Purpose	Property	.73	.68	.69	.70
	Participation	.49	.48	.48	.48
	People	.32	.32	.33	.32
	Progress	.28	.31	.26	.28
	Passion (Engagement)	.23	.25	.23	.24
Property	Participation	.39	.41	.40	.40
	People	.14	.18	.17	.16
	Peace	.23	.25	.32	.27
	Progress	.21	.27	.26	.25
Participation	People	.16	.15	.09	.13
	Peace	.20	.11	.11	.14
	Progress	.35	.31	.34	.33
	Passion (Engagement)	.30	.28	.26	.28
People	Peace	.20	.31	.28	.26
Progress	Passion (Engagement)	.24	.25	.28	.26
	R ² for Property	.53	.47	.48	.49
	R ² for Participation	.66	.67	.66	.66
	R ² for People	.33	.35	.29	.32
	R ² for Peace	.29	.33	.35	.32
	R ² for Progress	.59	.64	.62	.62
	R ² for Passion (Engagement)	.48	.50	.49	.49
	Chi-squared (d.f. = 6)	109	94	113	105
	Chi-squared p value	.00	.00	.00	.00
	CFI	.99	.99	.99	.99
	NFI	.99	.99	.99	.99
	TLI	.97	.98	.98	.98
	Standardized RMSR	.02	.02	.02	.02

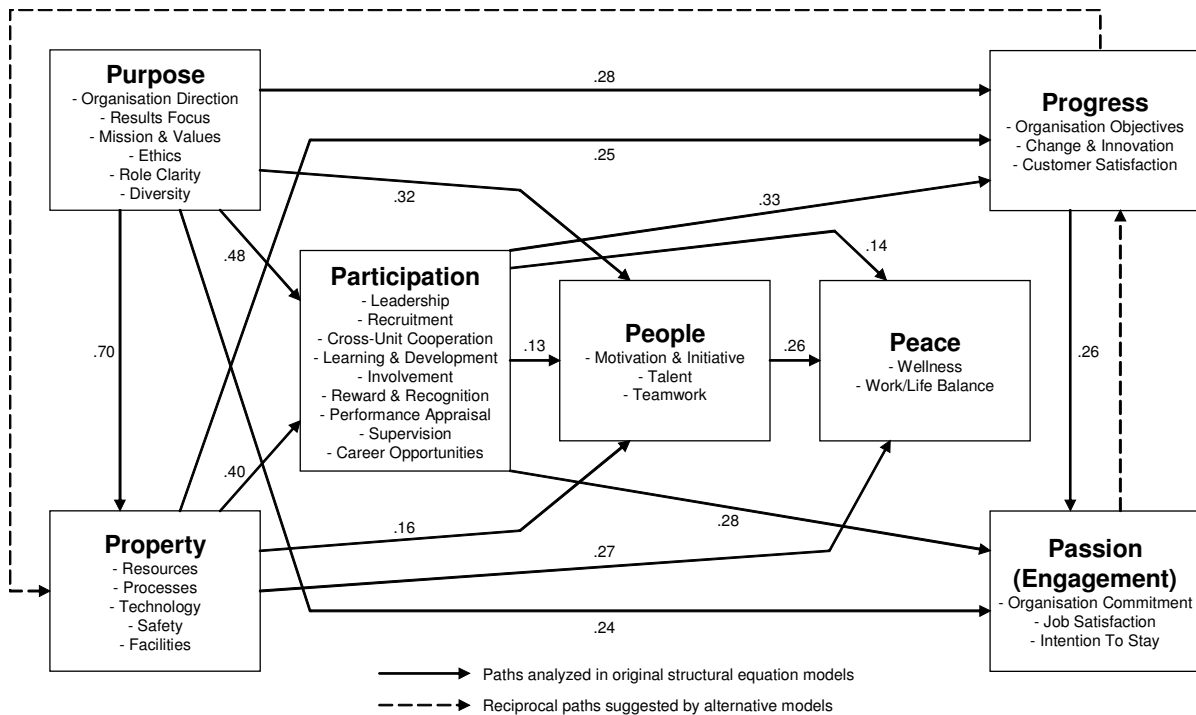


Figure 1. Structural equation model.

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