

DO YOU FEEL WHAT I FEEL? EMPOWERMENT CONTAGION IN PROJECT TEAMS

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Psychological empowerment, described as constellation of experienced cognitions manifested as sense of meaning, competence, impact, and self-determination has been identified as an important motivating force in teams with performance consequences for individuals and teams. Prior research have therefore sort to identify factors from the individual-, team-, project- and organisation-levels that impact empowerment cognitions with the hope of providing concrete targets for promoting psychological empowerment. One constituency that has been overlooked is the likelihood that psychological empowerment in teams may be capable of being transmitted from one team member to another. This paper reports a study investigating whether psychological empowerment cognition in project teams is contagious. Using survey responses from 380 individuals, nested in 115 project management teams, we test the psychological empowerment contagion hypothesis using analysis of variance, interrater agreement and hierarchical linear modelling as proxies. Analysis of variance indicates that the between-team variance of team psychological empowerment is statistically significant and substantially larger than the within-team variance. Several measures of interrator agreement also show considerable agreement (consensus) within teams, further confirming the prevalence of psychological empowerment in teams. Team psychological empowerment also has a significant positive and independent impact on individual psychological empowerment, even after controlling for the impact of variables previously identified as influencing psychological empowerment. Team members who reported higher levels of team psychological empowerment were also more likely to experience higher levels of individual psychological empowerment themselves. Psychological empowerment is contagious and can be transmitted from one team member to another. These findings supplement the traditional sources of antecedents of empowerment and suggest that team members play an important multiplier role in engendering feelings of psychological empowerment both consciously and unconsciously.

Keywords: contagion, Hierarchical Linear Modelling (HLM), project team, psychological empowerment

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INTRODUCTION

Empowerment has attracted the interest of both researchers and practitioners recently. Conceptual developments have begun to shift beyond dimensionalisation, to identifying antecedents and consequences of empowerment (c.f. Seibert *et al.* 2011). Factors that impact empowerment cognitions from the individual-, team-, project- and organisation-levels have been highlighted (e.g. Seibert *et al.* 2011, Tuuli and Rowlinson 2010a) with the hope of providing concrete targets for promoting empowerment in different work settings. One constituency that appears to have been overlooked is the likelihood that empowerment, and psychological empowerment in particular in teams, may be capable of being transmitted from one team member to another. In other words, is it likely that psychological empowerment is contagious, capable of being transmitted, like a virus, from one team member to another? While the contagious nature of psychological empowerment has not previously been examined specifically, researchers have explored contagion effects of other related concepts, such as motivation (c.f. Wieseke *et al.* 2011), emotion (c.f. Bakker *et al.* 2001 and Bakker *et al.* 2005), epidemics (c.f. Worthen 1973), burnout (c.f. Bakker and Schaufeli, 2000, Bakker *et al.* 2005), risk perception (c.f. Scherer and Cho, 2003), learning (c.f. Pressey *et al.* 2011), financial markets (c.f. Inci *et al.* 2010) and community protests against construction projects (c.f. Teo and Loosemore, 2009, 2010a, 2010b, 2011).

This study sets out to examine if psychological empowerment cognition is contagious in project teams using a Hong Kong sample. The psychological empowerment contagion hypothesis is tested using analysis of variance, interrater agreement tests and hierarchical linear modelling as proxies, concluding that psychological empowerment is contagious and can be transmitted from one team member to another. In the sections that follow, psychological empowerment is explained, followed by a discussion of contagion theory and why psychological empowerment may be contagious. The results of the tests of emergent hypotheses are presented and discussed.

PSYCHOLOGICAL EMPOWERMENT

Psychological empowerment is a constellation of experienced cognitions manifested as sense of meaning, competence, impact and self-determination (Conger and Kanungo 1988; Spreitzer 1995a). According to Spreitzer and Quinn (2001, p. 13-14) psychologically empowered individuals and teams “see themselves as having freedom and discretion (*self-determination*), as having a personal connection to the organisation (*meaning*), as confident about their abilities (*competence*), and as able to make a difference in the system in which they are embedded (*impact*)”. Analysis of individual level psychological empowerment (*individual empowerment*) predominates in the extant literature on empowerment (e.g. Spreitzer 1995a, 1995b).

As a result of the growth and pervasive use of teams to accomplish tasks, however, researchers have begun to conceptualize and examine psychological empowerment at the team-level (*team empowerment*) (e.g. Mathieu *et al.* 2006). Analogous team-level conceptualization of psychological empowerment has therefore emerged (e.g. Kirkman and Rosen 1997, Mathieu *et al.* 2006). Mathieu *et al.* (2006, p. 98) define team empowerment as the “team members’ collective belief that they have the authority to control their proximal work environment and are responsible for their team’s functioning”. Kirkman and Rosen (1997) take a multifaceted view and proposed a four-dimensional structure of team empowerment comprising the team

members' shared perception of *potency, meaningfulness, autonomy and consequences*. These dimensions are parallel to the individual empowerment dimensions developed by Spreitzer (1995a). In contrast to individual empowerment, team empowerment focuses on collective perception. It is therefore critical to note that team empowerment is not simply the aggregation of individual empowerment to the team-level, but represents a distinct team-level construct with no meaningful existence as an individual-level construct. From the foregoing therefore team (psychological) empowerment and individual (psychological) empowerment are conceptually distinct. We therefore hypothesize that;

H1: Individual and team psychological empowerment are empirically distinct constructs.

CONTAGION THEORY

Contagion theory is premised on a disease metaphor (Monge and Contractor, 2003) and seeks to explain network members' knowledge, attitudes and behaviour based on their exposure to the attitudes, information and behaviour of others (c.f. Rogers and Kincaid, 1981). It helps explain how exposure to contact may lead to social influence, imitation and mimetic behavior (Pressey *et al.* 2011). Some of the earlier works on the notion of contagion theory were in the medical innovation diffusion studies by Herbert Menzel and his colleagues (c.f. Menzel and Katz 1955, Coleman *et al.* 1966), in which they examined the sociometric process that took place when a new pharmaceutical product was released for sale and the impact that new entity showed in a definable geographical area (Worthen 1973). They concluded that there was a contagious process, analogous to disease epidemic, involved in how the medical innovation spread through social channels, resulting in simultaneous adoptions of the drug by a socially close-knit group of physicians (Menzel and Katz 1955). Contagion theory does not require that there is intent to influence the transmission of behaviour, emotions and actions, or even an awareness of influence; only that communication, interaction or contact takes place (Scherer and Cho 2003).

Contemporary literature is replete with studies testing or applying contagion theory in relation to several concepts, e.g., epidemics (c.f. Worthen 1973), emotion (c.f. Bakker *et al.* 2001 and Bakker *et al.* 2005), motivation (c.f. Wieseke *et al.* 2011), burnout (c.f. Bakker and Schaufeli 2000, Bakker *et al.* 2005), risk perception (c.f. Scherer and Cho 2003), learning (c.f. Pressey *et al.* 2011), financial markets (c.f. Inci *et al.* 2010) and community protests against construction projects (c.f. Teo and Loosemore, 2009, 2010a, 2010b, 2011). From a social network perspective, the idea of social contagion suggests that due to social influence, individuals adopt the attitudes or behaviours of others in the social network with whom they communicate (Scherer and Cho 2003, Burt 1987). From an emotional perspective, contagion is defined as "the tendency to automatically mimic and synchronize facial expressions, vocalizations, postures and movements with those of another person and consequently, to converge emotionally" (Hatfield *et al.* 1994). Other than automatic mimicry or facial feedback, emotional contagion can also occur via a conscious cognitive process of "tuning in" to the emotions of others (Bakker *et al.* 2001). Based on this perspective Bakker and his colleagues have examined burnout contagion and the underlying processes among intensive care nurses, general practitioners and teachers (c.f. Bakker and Schaufeli, 2000, Bakker *et al.* 2005).

It has also been suggested that motivation could have contagion effects similar to that found with regards to emotions and burnout. This is captured under the *motivation*

spill over phenomenon, defined as the transfer of different components of motivation from one person to another (c.f. Wieseke *et al.* 2011, Chen and Kanfer 2006). The notion of motivation spillover is supported by social learning theory which posits that individuals learn from significant others by observing the behaviors of others (Bandura 1977).

PSYCHOLOGICAL EMPOWERMENT CONTAGION IN TEAMS

Among the various concepts examined with regards to contagion theory in the literature, the contagion effects of motivation offers the clearest evidence in support of an expectation that psychological empowerment will also have contagion effects. As Bandura *et al.* (1980) point out, seeing or visualizing significant others performing tasks successfully can raise perceptions of efficacy, because observers infer that they may be able to master comparable tasks. Like motivation, psychological empowerment is reliant on cognition and is often the result of response to external stimuli. Davis and Luthans's (1980) social learning framework for organizational behaviour explicitly incorporates cognitions, emphasizing that cognitions can be acquired through social learning. This view of acquisition of cognitions through social learning is consistent with contagion theory perspective of the transmission of emotions, behaviours, actions, etc.

From the foregoing, it appears reasonable to assume that the mechanisms involved in psychological empowerment contagion processes are similar to those involved in the various contagion processes described above involving motivation, emotion, burnout, epidemics, risk perception and financial markets. First, project teams exhibit conditions that can be described as necessary for the development of a 'climate for contagion'. Drawing on Anderson and West (1998), these conditions are (a) individual interaction, (b) existence of some common goal which predisposes individuals toward collective action, and (c) the existence of sufficient task interdependence. These are characteristic features of many project teams and, thus, should support the development of shared perceptions regarding a climate for empowerment among project team members. Such a climate should therefore promote psychological empowerment contagion in project teams.

Second, psychological empowerment contagion may occur through a processes of individual team members becoming psychologically empowered (*catching the virus*) as a result of interactions with other team members who express psychological empowerment cognitions. Specifically, this can occur through the confidence they show in their task performance abilities (competence), their influence in the project organization (impact), their commitment and attachment to team and project goals (meaning) and overall the freedom to decide on how best to undertake their tasks (self-determination). Given the motivating nature of psychological empowerment, this view is supported by the motivation spillover phenomenon (Wieseke *et al.* 2011) and from social learning theory perspective that suggests that motivation can be contagious (c.f. Bandura 1997). As LePine and Van Dyne (2001) point out, in work teams, a team member who demonstrates a low level of motivation may generate negative affective reactions among other team members (even un-intentionally), and so decrease team-level motivation, lower morale, disrupt task performance, and alter leader behaviors. However, when team members believe their team is composed of capable members who can collectively accomplish the team's mission, they are also likely to believe they can effectively perform their role in their team, given that their role is highly dependent on other team members' roles (Chen and Kanfer 2006). This

manifestation of empowerment contagion is synonymous with Bakker and his colleagues (c.f. Bakker & Schaufeli, 2000, Bakker, *et al.* 2001, Bakker *et al.* 2005) conceptualization of burnout contagion in terms of the “prevalence of burnout complains among colleagues”. We therefore expect that team empowerment can be so pervasive that it positively influences individual empowerment and thereby promote psychological empowerment contagion. Thus, we posit that;

H2: Team empowerment will be positively and significantly related to individual empowerment.

Corollary,

H3: Psychological empowerment is contagious such that team members who report high levels of team empowerment also experience higher levels of individual empowerment.

METHOD

Sample

Project management teams of construction organisations who work together on the same project their organisation is involved in Hong Kong were the source of the data for this study. The first administration of the questionnaire yielded 232 responses. A second administration to contact persons from whom one or no questionnaire was received in the first administration, yielded a further 150 responses, giving a total of 382 individual responses nested in teams from 115 organisations, a 23% response rate. A missing data pattern analysis resulted in the exclusion of 2 responses for excessive missing data (>50%) (c.f. Hair *et al.* 1998). The effective sample size for the analysis was therefore 380 individuals nested in 115 project management teams.

Overall, 53% of the respondents are older than 40 years, and 94% fall under the ranks of middle-management (40%), senior management (41%) and director level (13%). This distribution corresponds favourably to the target population of management-level staff. Males make up 89% of the sample, nationals of Hong Kong and China combined make up 82% and persons of Chinese ethnicity make up 87%. Average tenure in the construction industry is 17 years. In terms of education, 89% have a Bachelors degree or higher. Eighty-two percent of the organisations employ 50 or more people.

Measures

Individual psychological empowerment was measured with the 12-item scale developed by Spreitzer (1995a), which measures the 4 sub-dimensions; *meaning* ($\alpha = .85$), *competence* ($\alpha = .84$), *self-determination* ($\alpha = .80$) and *impact* ($\alpha = .85$). Sample items include “The work I do is very important to me” for the meaning dimension and “I am confident about my ability to do my job” for competence.

Team psychological empowerment was measured with Kirkman *et al.*'s (2004) 12-item scale ($\alpha = .93$), which measures the 4 sub-dimensions; potency, meaningfulness, autonomy and impact. Sample items include, “My team feels that its tasks are worthwhile” (meaningfulness) and “My team makes a difference in this organization” (impact). In this study we equate team psychological empowerment, which measures team members' collective belief of the prevalence of psychological empowerment in the team, to the manifestation of psychological empowerment contagion. This mirrors similar contagion conceptualisations in previous research. For example, Bakker and his colleagues (c.f. Bakker & Schaufeli, 2000, Bakker, *et al.* 2001, Bakker *et al.* 2005) conceptualise and measure burnout contagion as the “prevalence of burnout complains

among colleagues". To the extent that psychological empowerment prevalence is demonstrated, empowerment contagion can be inferred.

All the above measures were anchored with a 5-point Likert scale. A number of control and demographic variables were also measured. *Gender, age, educational, ethnicity, nationality* and *tenure* were measured using single item questions. Organisational characteristics such as *firm age* and *size* were also measured. We also controlled for the effect of the four different types of teams from which data was collected; contractor teams (Team Type 1-CM), client teams (Team Type 2-Client), consultant teams (Team Type 4) and teams that played a dual role of client's representative and designer/Architect (Team Type 3-Dual). Given the tendency for individuals to "fake good" in self-report surveys, we also measured *social desirability* using the 10-item short version of the Marlowe-Crowne 33-item scale of socially desirability, proposed by Strahan and Gerbasi (1972).

Data Analysis Strategy

No single data analysis technique is appropriate for testing all the three hypotheses proposed in this study. We used confirmatory factor analysis to test the first hypothesis while analysis of variance (ANOVA) and multiple interrater agreement measures were used as proxies to specifically assess the contagion hypothesis of psychological empowerment (i.e. Hypothesis 3) following the work of Bakker and his colleagues (c.f. Bakker & Schaufeli, 2000, Bakker, *et al.* 2001, Bakker *et al.* 2005). Analysis of variance and interrater agreement demonstrate consensus of the prevalence of a phenomenon and can therefore be used to infer the presence of contagion effect. The cross-level relationship proposed in the second hypothesis was analysed using Hierarchical Linear Modelling (HLM, Bliese and Hanges 2004).

RESULTS

Descriptive Statistics and Correlations

The reliabilities and dimensionality of all multi-item measures were assessed by exploratory factor analysis. The scale items loaded as hypothesised or meaningfully and the measures also exhibited acceptable reliabilities (see the "Measures" section above for details of values of α). The descriptive statistics and zero-order correlations among the variables show that all correlations are below .80, the threshold of very high correlations when multicollinearity is obvious. The correlations between the social desirability measure and team type 1-contractor and team empowerment variables are higher than the threshold of between -.20 and +.20 suggested by (Mitchell and Jolley 2001), an indication that social desirability bias strongly influence these measures and thus warrants controlling for in the analysis.

Tests of Hypotheses

For the cross-level analysis (i.e. test of hypothesis H2), age, gender, education, nationality, ethnicity, firm size and age, tenure and team type as well as social desirability were included as control variables due to their possible confounding effects on the relationship (c.f. Spreitzer, 1995b).

Tests of Hypothesis H1

Confirmatory factor analysis was used to establish the empirical distinctiveness of the individual and team empowerment as a direct test of hypothesis H1. The fit of a hypothesized model in which there were 2 second-order factors, corresponding to the 2 facets of empowerment, was compared with an alternative model where one second-order factor was specified. The analyses were performed using Amos 16.0 statistical

analysis software. The results show that the hypothesized two-factor model fit the data well, $\chi^2(1017, N = 380) = 2895.97$, relative noncentrality index (RNI) = .82, comparative fit index (CFI) = .88, root-mean-square error of approximation (RMSEA) = .07. As expected, the alternative model in which all 8 dimensions loaded onto one second order factor fit the data significantly worse, $\Delta\chi^2(2, N = 380) = 104.89, p < .001$, RNI = .82, CFI = .87, RMSEA = .07. Taken together, Hypothesis H1 which posited that individual and team empowerment are empirically distinct constructs, is supported.

Tests of Hypothesis H2

Prior to testing Hypotheses H2, a *null model* (i.e. a model without predictors, a requisite first step in HLM analysis to decompose the variance in the outcome variable) was run with individual empowerment as the dependent variable, (i.e. model 1a in Table 1). The results provide evidence of significant within-team ($\sigma^2 = .47, p < .001$) and between-team ($\tau_{00} = .08, p < .01$) variance in individual empowerment. This information was used to calculate the interclass correlation coefficient (ICC), a measure of non-independence and, thus, an indication of the proportion of the variance in the outcome variable that is attributable to team membership. The calculation gives an ICC of .17 (or 17% of variance), confirming the presence of non-independence in the observations and justifying the use of HLM to test the hypothesis involving individual empowerment.

Model 2a (Table 1) with only the control variables as predictors was then run next. Only gender ($\beta = -.26, p < .05$) and firm size ($\beta = .28, p < .01$) significantly influence individual empowerment. An examination of the zero-order bivariate correlations, however, shows that gender and individual empowerment are not significantly related ($r = .08, ns$) while firm size and individual empowerment are actually negatively and significantly related ($r = -.19, p < .001$). This suggests that the regression findings pertaining to the effect of gender and firm size on individual empowerment may be *spurious* as a result of *suppressor effects*. The spurious nature of the regression findings on gender effects is the *classical suppression* scenario (c.f. Cramer, 2003, Cohen and Cohen 1983), where an independent variable (the suppressor) has no association with the independent variable but correlates positively with other independent variables in the model thereby acquiring a negative regression coefficient when entered together in the same model. The case of firm size is the *negative or net suppression* scenario (Cohen and Cohen, 1983), where the sign of the regression weight of the independent variable is the opposite of what should be expected on the basis of the correlation with the dependent variable. Thus, in interpreting the results in such circumstances greater weight is normally placed on the zero-order correlation (Cramer, 2003). Based on this logic therefore the significant regression finding for the link between both gender and firm size and individual empowerment are rejected for being spurious. Although the control variables together account for 7% of the variance in individual empowerment (lower part of Table 1) no significant finding in terms of any single control variable is discernable.

Table 1: HLM Analysis of Empowerment Inter-relationships

Variables	Individual Empowerment		
	1a	2a	3a
Gender		-0.26*	-0.06
Age		-0.06	0.02
Education		0.08	0.03
Nationality		-0.09	-0.04
Ethnicity		-0.28	-0.13
Tenure in industry		0.01	0.01
Firm Size		0.28**	0.28**
Firm Age		0.00	0.00
Team Type 1 (CM)		0.27	0.31*
Team Type 2 (Client)		0.11	0.28*
Team Type 3 (Dual)		-0.09	0.11
No respondents		0.03	0.04
Social Desirability		0.04	-0.00
Team Empowerment		-	0.81***
<i>Random Parameters</i>			
σ^2	.47***	0.47***	0.13***
τ_{00}	.08**	0.04	0.11***
R^2_1	-	0.07	0.56
ΔR^2_1 (Unique)	-	0.07	0.49
Deviance (-2LL)	838.97	769.28	312.8***

NOTE: *p < 0.05; **p < 0.01; ***p < 0.001.

Finally, models 3a (Table 1) was estimated to directly test Hypothesis H2. The results indicate a highly significant relationship between team empowerment and individual empowerment ($\beta = .81, p < .001$), with team empowerment explaining 49% of the variance in individual empowerment. Thus, Hypotheses H2 is supported.

Tests of Hypothesis H3

A one-way analysis of variance (ANOVA) was computed with team empowerment as the dependent variable. This compared the within and between team variance of the 115 teams from which data was collected from. The results indicate that the between-team variance is significantly and substantially larger than the within-team variance ($F(64, 315) = 17.735, P < 0.001$). This implies that there is considerable *consensus* within teams about the prevalence of psychological empowerment. This lends support to the preliminary analysis that showed that there is a significant between-team variance in individual empowerment ($\tau_{00} = .08, p < .01$), equivalent to 17% of variance. In other words 17% of the between-team variance in individual empowerment can be attributed team empowerment. To further confirm consensus of the prevalence of psychological empowerment and justify aggregation of the team empowerment, two categories of indexes were calculated using the R software (available at www.r-project.org); James *et al.*'s (1984) interrater agreement index

($r_{WG(J)}$) and Burke *et al.*'s (1999) Average Deviation indexes (i.e. AD_M and AD_{Md}). Significance tests show that there is acceptable agreement or consensus among team members regarding the prevalence of psychological empowerment, supporting aggregation (i.e. $r_{WG(J)} = 0.96$, $p < 0.01$; $AD_{M(J)} = 0.44$, $p < 0.01$; $AD_{Md(J)} = 0.36$, $p < 0.01$). Taken together therefore, Hypothesis H3 is also supported.

DISCUSSION AND IMPLICATIONS

This study set out to examine if psychological empowerment cognition is contagious in project teams. First, the findings lend empirical support to the theoretical distinctiveness of individual and team psychological empowerment constructs. This enabled us to assess the influence of team empowerment as providing an external stimulus that influences individual empowerment and thereby promote psychological empowerment contagion.

With regards to psychological empowerment contagion, the analysis of variance results indicate that the between-team variance of team psychological empowerment is statistically significant and substantially larger than the within-team variance. This implies that there is considerable agreement (consensus) within project teams regarding the prevalence of psychological empowerment. In addition, the results of the HLM analyses show that team empowerment make a statistically significant and unique contribution to explaining variance in individual empowerment, even after controlling for the impact of variables previously identified as influencing psychological empowerment. Team members who reported higher levels of team psychological empowerment were also more likely to experience higher levels of individual psychological empowerment themselves. These findings are consistent with those found by Bakker and his colleagues with regards to the contagion effect of burnout among intensive care nurses, general practitioners and teachers (c.f. Bakker and Schaufeli, 2000, Bakker *et al.* 2005). In accord with assertions by Bandura (1977) and Chen and Kanfer (2006) and more recently by Wieseke *et al.* (2011), psychological empowerment exhibits similar spillover effects as motivation. To the extent that team members perceive a prevailing high level of psychological empowerment among their team members (i.e. team psychological empowerment), the results show that this tend to influence high individual psychological empowerment cognition. Psychological empowerment is therefore contagious and can be transmitted from one team member to another. These findings supplement the traditional sources of antecedents of empowerment and suggest that team members play an important multiplier role in engendering feelings of psychological empowerment both consciously and unconsciously. With team empowerment contributing nearly half the variance in individual empowerment, project managers have a clear target for engendering individual psychological empowerment in project teams.

CONCLUSION

Prior research have identified factors from the individual-, team-, project- and organisation-levels that impact empowerment cognitions (e.g. Seibert *et al.* 2011, Tuuli and Rowlinson 2010a). This study suggests that team members are a key constituency for engendering psychological empowerment but who may have been overlooked. The contagion hypothesis of psychological empowerment therefore exposes an important antecedent of psychological empowerment in team member empowerment. Future research may focus on the precise processes responsible for psychological empowerment contagion to find answers to questions with regards to whether empowerment contagion is a result of conscious or unconscious processes. In

a similar vein, measuring specifically susceptibility to psychological empowerment can be used to further demonstrate empowerment contagion in accord with Bakker and his colleagues (c.f. Bakker & Schaufeli, 2000, Bakker, *et al.* 2001, Bakker *et al.* 2005). Lastly, this study adds to the studies of Teo and her colleagues (c.f. Teo and Loosemore, 2009, 2010a, 2010b, 2011) in demonstrating the applicability of contagion theory in construction management research.

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