Modelling Employees' Suggestion-Making Behaviour

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Abstract

The paper outlines a model of employee participation in suggestion systems based on the Theory of Planned Behaviour (TPB; Ajzen, 1991). The model was tested by administering a questionnaire to line workers in an automotive plant (Toyota Motor Manufacturing, Kentucky Inc.). Participation rates in the suggestion system have been assessed three months after the main data collection. Overall, the findings supported the proposed model. Structural model A, which included the TPB variables only, accounted for 5% of explained variance in participation in the suggestion system and 46% of explained variance in intention to submit suggestions. Structural model B, which considered the indirect effects of other relevant constructs (proactive personality, organizational trust, perceived rewards, and supervisory support to continuous improvement activities) accounted for 4% of explained variance in participation in the suggestion system, 38% of explained variance in intention to submit suggestions, and 29% of explained variance in attitudes toward submitting suggestions.

Introduction

Organizations that foster employee participation tend to perform better on several performance indexes, such as profitability and perceived quality. Employee participation also plays a critical part in supporting innovation by facilitating the development of new or improved products, services, and processes (Appelbaum, Bailey, Berg, & Kalleberg, 2000). Although the importance of fostering employee participation to support innovation is widely recognized, commentators argued for more empirical research on specific practices that may have a positive impact on workers' participation. Suggestion systems, the focus of several investigations in recent years, are one of the most studied of such practices (Axtell et al., 2000; Clegg, Unsworth, Olga, & Parker, 2002; Frese, Teng, & Wijnen, 1999; Lipponen, Bardi, & Haapamäki, 2008; Oldham & Cummings, 1996; Rapp & Eklund, 2002).

Previous studies have identified a list of key factors in the process of suggestion-making; however, some researchers have called for a more "theory-driven" approach in the field. So far, *ad hoc* models have been created from eclectic collections of constructs (Anderson, De Dreu, & Nijstad, 2004). The present study extends the existing literature by outlining and testing a model of employee participation in suggestion systems. This study differs from previous contributions by taking a "theory-driven" approach: The core of the model derives, in fact, from the Theory of Planned Behaviour (TPB; Ajzen, 1991). The indirect effects of constructs derived from previous

research have also been considered in the model. The major potential contributions of the present study include the opportunity to test: a) whether TPB can be applied in a novel context to explain suggestion-making behaviour; b) whether TPB does better than previous approaches used in the past to study employee participation in suggestion systems; and c) whether previous findings can be integrated under a unifying theoretical model.

Background and Literature Review

Suggestion systems are formal communication channels that allow a continuous and regulated exchange of information between management and employees. Eastman Kodak established the first suggestion system in 1898 (Robinson & Schroeder, 2004). Over the years, the basic procedure involved in submitting suggestions has remained largely unchanged. Typically, employees are required to write their suggestions on specially-designed forms and to post them in "suggestion boxes." More recently, suggestions can also be filed electronically. The person or the committee in charge of the suggestion system assesses the value of a suggestion according to pre-defined criteria. Suggestions that meet the criteria are implemented and the employee receives compensation that is normally based on a percentage of the sum that the organization has gained or saved by implementing the employee's idea.

Suggestion systems serve several important functions: 1) they allow the transformation of employees' tacit knowledge into explicit knowledge; 2) they facilitate the creation of new routines (innovatory suggestions) and the improvement of existing routines (corrective suggestions); 3) they channel "employee voice," through which employees can express concerns and grievances to management; and 4) they promote participation and involvement, raising workforce's morale and productivity (Fuller, Helbling, & Cooley, 2002). Well-implemented suggestion systems can also have a significant impact on the organizational bottom line. According to a recent survey, the ten most successful suggestion programs worldwide provided an average benefit of $3,095 per implemented idea (Wood, 2003). Many commentators consider the suggestion system in place at the car manufacturer Toyota as the most successful example. On average, employees at Toyota submit 1.5 million suggestions company-wide each year, generating $300 million in annual savings (Robinson & Schroeder, 2004).

Recent empirical research offered valuable insights on factors that influence employees' suggestion-making behaviour (Axtell et al., 2000; Clegg, Unsworth, Olga, & Parker, 2002; Frese, Teng, & Wijnen, 1999; Lipponen, Bardi, & Haapamäki, 2008; Oldham & Cummings, 1996; Rapp & Eklund, 2002). Despite the interesting findings, some shortcomings can be highlighted. From a theoretical perspective, previous research has generally adopted an "eclectic approach" (Axtell et al., 2000), namely the relationships among different constructs have been explored without a comprehensive theoretical framework. The mere crunching of data obtained from a list of variables cannot be considered as a significant theoretical contribution (Sutton & Staw, 1995). These *ad hoc* models are also problematic because they do not allow comparisons among different employee involvement practices. For instance, it is not clear how Frese et al.'s (1999) three "process" parameters and Axtell et al.'s (2000) two phases in suggestion-making can be compared with each other or be applied to other involvement practices, such as participation in quality circles. Therefore, scholars have called for a more "theory-driven" approach in the field of innovation studies (Anderson, De Dreu, & Nijstad, 2004).

From a methodological perspective, previous studies have adopted cross-sectional research designs. Cross-sectional studies do not provide enough evidence for the causal relations implied by the proposed models. It should also be noticed that participation in suggestion systems has been operationalised in past research using either archival data or self-reported measures of past performance. Past behaviour can be a predictor of future behaviour; however, commentators have called for more longitudinal studies, which are more appropriate to support causal or predictive claims (Anderson, De Dreu, & Nijstad, 2004).

The aim of the present study is to address these theoretical and methodological limitations. This investigation is theory-driven: It outlines and tests a model of suggestion-making behaviour (figure 1) that is grounded on the Theory of Planned Behaviour (Ajzen, 1991). TPB applies to any specific human behaviour under volitional control and is one of the most influential theories in the literature that deals with the attitude-behaviour relation (Armitage & Conner, 2001). Instead of merely explaining past behaviour, the proposed model has been tested to predict future participation in suggestion systems. Therefore, from a methodological standpoint, this study moves from the traditional cross-sectional design and includes an element of longitudinal data.

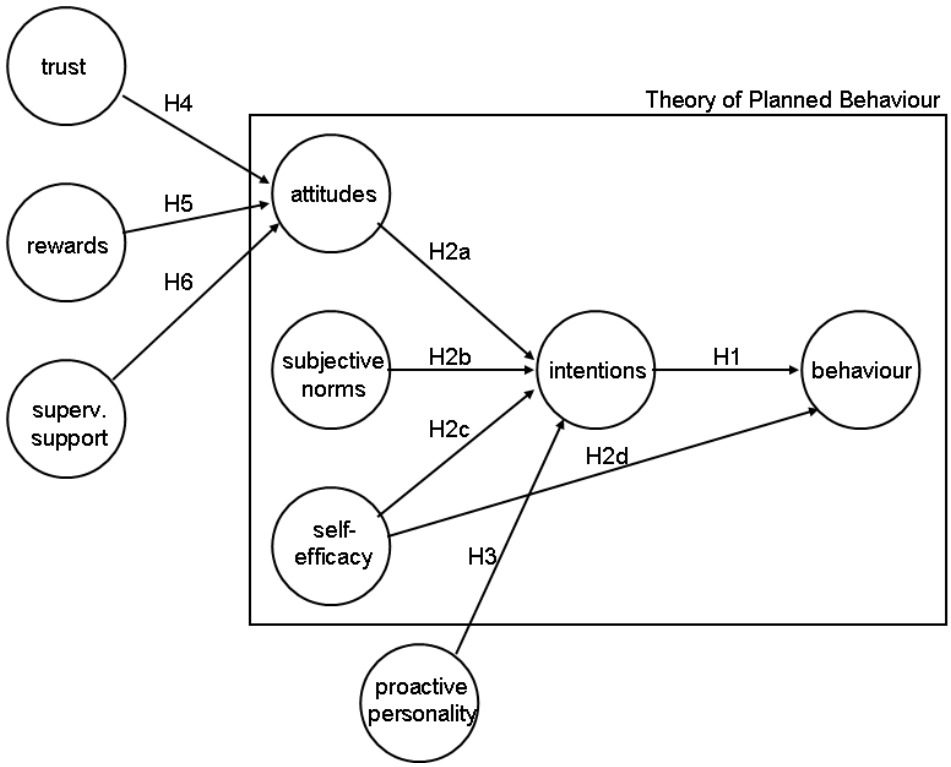

Figure 1. A Model of Employees' Suggestion-Making Behaviour

A Model of Employees' Suggestion Making Behaviour: Theory Development

The goal of the proposed model is to explain and to predict employee participation in suggestion systems. Instead of defining arbitrary subdivisions in the processes of suggestion-making, the basic idea of the model stems from the consideration that suggestion-making behaviour shares a fundamental characteristic with other employees' extra-role behaviours: Submitting suggestions is, in fact, one of the possible change-oriented discretionary behaviours (Morrison & Phelps, 1999). TPB (Ajzen, 1991) has been developed to explain and to predict any specific human behaviour under the individual's complete volitional control. It has been successfully applied in several fields, such as health psychology, sports, and marketing, generating an extensive literature (Armitage & Conner, 2001).

TPB considers five constructs: Behaviour, intention, attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). According to TPB, the likelihood of the occurrence of a specific behaviour under volitional control is positively related to the strength of an individual's *intention* to perform such behaviour. In the present study, submitting suggestions is a function of an employee's intention to do so.

Hypothesis 1: The likelihood that an employee submits suggestions is a function of the strength of the employee's intention to submit suggestions.

Intention to perform a specific behaviour is a function of three constructs: Attitudes, subjective norms, and perceived behavioural control. *Attitudes* are defined as an individual's overall evaluation regarding the behaviour under consideration. The more an employee feels that submitting suggestions is important, useful and rewarding, the more likely he or she will actually do so.

Hypothesis 2a: The strength of an employee's intention to submit suggestions is a function of the employee's attitudes toward submitting suggestions.

Subjective norms refer to an individual's perceived pressure to perform a specific behaviour. If an employee perceives that his or her peers (e.g., members of the same team) support his or her suggestion-making behaviour, then he or she will more likely do so.

Hypothesis 2b: The strength of an employee's intention to submit suggestions is a function of the employee's subjective norms regarding submitting suggestions.

Perceived behavioural control (PBC) is the third antecedent of intention and refers to the individual's perceived control over the target behaviour. PBC shares some similarities with Bandura's (1997) concept of self-efficacy, which encompasses an individual's perceived ability to perform a specific task. The relationship between PBC and self-identity has long been debated. PBC include not only the individual's perceived control over his or her internal resources or abilities, but also his or her perceived control over possible external constraints in the environment. Self-efficacy only covers the internal aspects of PBC. Recent meta-analysis has found PBC's "internal component" to be a strong predictor of intention and behaviour, while its

"external component" was weak in this regard (Armitage & Conner, 2001). Therefore, Bandura's (1997) concept of self-efficacy has been used in the present study.

Hypothesis 2c: The strength of an employee's intention to submit suggestions is a function of the employee's self-efficacy in submitting suggestions.

PBC can also predict behaviour together with intention under certain conditions, such as when an individual's perceptions of control accurately reflect his or her skills or resources. Similarly, self-efficacy has been found positively related with actual behaviour (Stajkovic & Luthans, 1998).

Hypothesis 2d: The likelihood that an employee submits suggestions is a function of the employee's self-efficacy in submitting suggestions.

Expanding the TPB model. TPB is a complete theory of behaviour under volitional control (Ajzen, 1991). Therefore, the previous set of hypotheses is expected to be sufficient to explain and predict suggestion-making behaviour. At the same time, it is also relevant to assess possible indirect effects of other factors that have been identified in the literature on suggestion systems. The integration between previously studied constructs and TPB constructs can, in fact, provide evidence of the organizing power of the proposed model. It is important to highlight a significant difference between past and current research on suggestion-making behaviour. Previous research assumed that these other factors had a direct impact on behaviour, whereas in the present study the influence of these factors on behaviour is expected to be mediated by TPB constructs.

It is beyond the reach of this study to consider every single variable in the literature on suggestion-making behaviour—extensions of the model are left for future investigations. The present research is limited to a selection of constructs, which have shown a statistically significant impact on suggestion-making behaviour. To have a comprehensive selection of predictors, variables from different level of analysis have been selected. The final model includes four variables from three different levels: Proactive personality (a personality level characteristic); trust (an interpersonal level characteristic); supervisory support and rewards (two organizational level characteristics).

Proactive personality. Both Oldham and Cummings (1996) and Frese et al. (1999) have taken into account personality level variables: The former considered "creative personality" and the latter "personal initiative at work." Instead of using Frese et al.'s (1999) original "personal initiative at work," a similar trait named "proactive personality" (Crant, 2000) has been here used. "Proactive personality" refers to a person's tendency to scan the environment for opportunities, to show initiative, and to take action. This personality trait has been correlated with outcomes such as job performance, leadership effectiveness, and membership in voluntary continuous improvement groups (Crant, 2000). Past studies have included personality traits in TPB as predictors of behavioural intention (Conner & Abraham 2001). A similar relationship is hypothesised in the present study: Proactive employees are expected to have a stronger intention to participate in the suggestion system because of their tendency to improve the environment around them.

Hypothesis 3: Intention to submit suggestions mediate the relationship between an employee's degree of proactivity and his or her suggestion-making behaviour.

Trust. Clegg et al. (2002) considered two types of trust: "Trust that heard" (an expectation that the organization will take a suggestion into consideration) and "trust that benefit" (an expectation that the organization will fairly compensate suggestions—this aspect will be discussed in the next section on "rewards"). Instead of the more specific "trust that heard," a more traditional conceptualization of "organizational trust" has been employed to assess employees' trust toward management (Cook & Wall, 1980). Studies have found that trust impacts the degree of communication openness between management and employees (Dirks & Ferrin, 2001). It is here hypothesised that attitudes toward submitting suggestions and intention to submit suggestions mediate the relationship between trust and actual behaviour.

Hypothesis 4: Attitudes toward submitting suggestions and intention to submit suggestions mediate the relationship between an employee's trust toward management and his or her suggestion-making behaviour.

Rewards. Rewards and incentives can be strategically used to elicit employees' discretionary effort (Coyle-Shapiro, 2002; Hackman & Wageman, 1995). In the case of suggestion systems, research has shown that rewards can reinforce employee participation (Schuring & Luijten, 2001). Clegg et al.'s (2002) study on "trust that benefit" also emphasized the positive role of fairness in the compensation of suggestions. In the same manner, it is here assumed that if employees perceive that their discretionary effort in submitting suggestions is not adequately recognized, they will more likely refrain from submitting suggestions. Considering that the notion of attitudes also addresses the degree to which an individual perceives an action as being rewarding (Ajzen, 1991), it is hypothesised that attitudes toward submitting suggestions and intention to submit suggestions mediate the relationship between rewards and behaviour.

Hypothesis 5: Attitudes toward submitting suggestions and intention to submit suggestions mediate the relationship between an employee's perceived fairness of the rewards of the suggestion system and his or her suggestion-making behaviour.

Supervisory/management support. Previous research pointed out the crucial role of management and supervisory support in fostering employee participation in suggestion systems (Axtell et al., 2000; Frese, Teng, & Wijnen, 1999; Rapp & Eklund, 2002). It is here expected that employees will more likely submit suggestions if they perceive that managers and supervisors encourage the continuous improvement of work routines. In particular, attitudes toward submitting suggestions and intention to submit suggestions mediate the relationship between supervisory support to continuous improvement activities and actual behaviour.

Hypothesis 6: Attitudes toward submitting suggestions and intention to submit suggestions mediate the relationship between an employee's perceived supervisory support to continuous improvement activities and his or her suggestion-making behaviour.

Research Design and Procedures

Research site. The Toyota Motor Manufacturing, Kentucky Inc.'s (TMMK) plant in Georgetown, KY has been chosen as research site. Established in 1989, the plant employs over 7,000 people and has the capacity to produce 500,000 vehicles and engines annually.

Research design. The study follows a *single-time-point observational research design with follow-up*. A questionnaire had been first administered to participants. Three months *after* the administration of the questionnaire, archival data have been retrieved to assess whether behavioural intention translated into actual behaviour (*follow-up*).

Research procedures. A survey package containing a consent form, a four-page questionnaire, and a self-addressed, pre-stamped return envelope was mailed to the entire population of TMMK's line workers (N = approx. 5,500). Two versions of the questionnaire with the same items but in different positions have been prepared to control for response-order effect. Employees randomly received one of the two versions. A drawing, with a chance to win one out of five $100 cash prizes, was used as financial incentive. Participants were asked to read the consent form, sign the form, fill in the attached questionnaire, and return all materials to the research team within two weeks. Participants were also required to provide their TMMK identification number and to authorize the research team to access archival data regarding their past and future participation in TMMK's suggestion system.

Respondents, response rate, and final sample. A total of 503 employees returned the questionnaire with a response rate of approximately 9.1%. In absolute terms, the total number of respondents is relatively large in comparison to the samples used in previous research. However, a 9.1% response rate may be problematic because of a possible selection bias. Listwise deletion of entries with one or more missing variables resulted in $N = 446$ (79.3% of the respondents). To check for possible differences between the entries that have been dropped and the entries that have been used in the final sample, a series of t-test have been run. Both control and study variables have been analyzed. The analysis showed only a significant difference in terms of ethnic composition, with the final sample including more Caucasians ($M = .92$ vs. $M = .80$), $t(501) = 2.99$, $p < .01$. The average age of the respondents fell in the 40 to 44-year range (composite average: 43.8 years, $SD = 7$). 76.2% of the respondents were males. The ethnic composition of the sample consisted of 92.8% Caucasians, 5.8% African-Americans, 0.7% Native Americans, 0.2% Latinos, and 0.4% other/mixed ethnicity. The average number of years of employment at TMMK was 11.9 years ($SD = 3.4$). 21.7% of the respondents held a four-year college degree, 16% a junior or community college degree, 23.3% a vocational school degree, 31.4% a high school degree, and 7.7% an unspecified degree. Follow-up analyses have been conducted to compare the characteristics of the sample to the characteristics of the entire population at TMMK. In comparison to the entire population, participants in the final sample were significantly older ($Z_{\text{Significance test for means (Gauss test)}} = 11.46$, $p < .001$). Caucasians were also significantly more represented in the final sample ($Z_{\text{Significance test for proportions}} = 3.37$, $p < .001$). In terms of participation rates, it was not possible to verify a selection bias in the final sample. A cumulative 5.8% of participants in the sample submitted at least one suggestion in the three months before the data collection. As for the entire population, TMMK's HR department provided only an average participation rate for each month (2%). Therefore, the cumulative

participation rate for the entire population in the three month period before the data collection can only be estimated between 2% (same participants every month) and 6% (different participants every month). A possible "Hawthorne effect" has been taken into account. A comparison of the participation rates three months before and after the data collection showed an actual decrease: 5.4% (before) vs. 4.7% (after).

Measures. The *intention to submit suggestions* three-item scale was based on Ajzen (1991; α=.99). *Attitudes toward submitting suggestions* was operationalised with a five-item scale based on Ajzen (1991; α=.90). *Subjective norms* were measured with a scale developed by Armitage and Conner (1999; α=.72). A four-item scale adapted from Midgley et al. (2000) was used to measure self-efficacy (α=.78). The five highest-loading items of the original scale by Bateman and Crant (1993) have been used for proactive personality (α=.78). Four of the highest-loading items of Cook and Wall (1980)'s *organizational trust* scale have been included in the questionnaire (α=.90). A three-item *satisfaction with rewards for submitting suggestions* scale was adapted from the "pay satisfaction" and "contingent reward" subscales of Spector's (1997) "Job Satisfaction Survey" (α=.82). A six-item scale developed by Coyle-Shapiro (2002) was used to measure *supervisory support to continuous improvement activities* (α=.94). Socio-demographic information (age, ethnicity, education, and number of years of employment at TMMK) has been collected at the end of the questionnaire. Each scale has been factor analyzed to check for unidimensionality. Harman's One-factor Test has been conducted to check for common method bias. No anomaly was found. A full correlation table including all study and control variables is reported in table 1.

Target behaviour: Submitting suggestions. Data for participation in the suggestion system have been retrieved by consulting the company's records. Archival data were available only for "approved suggestions," namely employees' recommendations that have been recognized as being worth implementation by TMMK. The raw number of suggestions that has been approved 3 months after the main data collection has been recoded into a dichotomous variable. If an employee had at least one suggestion approved over the three month period after completing the questionnaire, the variable was recoded with value "1;" otherwise, the variable was recoded with value "0." The recoded variables have been used in the final analysis.

Analyses

The model was tested using structural equation modelling (SEM). The goal was to verify whether TPB can be applied to explain suggestion-making behaviour (hypotheses 1 to 2d) as well as whether the TPB variables mediate the relationship between behaviour on one hand and rewards, organizational trust, and supervisory support on the other hand (hypotheses 3 to 6). Maximum likelihood was used as the method of estimation. The following variables have been used as control variables: Gender, age, years of employment at TMMK, education (1 = college degree and 0 = other degrees), ethnicity (1 = Caucasian and 0 = other ethnicities). Questionnaire version was used to check for response-order effect. When testing the validity of TPB only, the estimated model included direct paths from the control variables to intention and behaviour. When testing for the validity of the entire model, the estimated model also included a direct path from the control variables to attitudes.

TABLE 1 - Correlation table.

Variable	*M*	*SD*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age	43.80	7.00														
2. Gender	.76	.43	.02													
3. Education	.22	.41	-.18	.13‡												
4. Ethnicity	.92	.27	.09	.02	.03											
5. Years of emp.	11.09	3.41	.40‡	-.02	-.01	.01										
6. Quest. version	.54	.50	.04	-.11†	-.25	.06	-.04									
7. Part. in sug. sys	.05	.21	-.06	.05	.04	.02	-.02	-.07								
8. Intentions	3.00	1.95	-.14‡	.00	.01	-.02	-.24‡	-.14**	.23**							
9. Attitudes	4.08	1.45	-.11†	-.05	.00	-.10†	-.22‡	-.12**	.17**	.63**						
10. Sub. norms	2.36	1.22	-.11†	-.03	-.04	-.06	-.20‡	-.19**	.08*	.50**	.42**					
11. Self-efficacy	3.44	1.17	-.13‡	.03	.04	-.05	.05	-.05	.10*	.14**	.10*	.07				
12. Proactive pers.	5.04	.96	-.07	.00	.03	-.03	-.04	-.14**	.08*	.33**	.21**	.24**	.10*			
13. Org. trust	3.23	1.57	-.05	-.05	-.06	-.10†	-.19‡	-.04	.08	.29**	.49**	.25**	.03	.19**		
14. Rewards	2.79	1.43	-.06	-.17‡	-.07	-.09	-.15‡	.01	.08	.33**	.52**	.34**	-.02	.01	.41**	
15. Sup. support	4.50	1.57	-.07	-.08	.01	.01	-.08	-.03	.10*	.21**	.35**	.21**	.02	.14**	.47**	.28**

† $p < .05$; ‡$p < .01$. N = 446. Note: Two-tailed Pearson's correlations.
*$p < .05$; **$p < .01$. N = 446. Note: One-tailed Pearson's correlations.

Normality Checks, Power, and Estimation Procedure. Continuous variables were assessed for normality. No anomalies have been found. Sample sizes of the tested models suggested sufficient statistical power to support analyses at $\pi = .80$ (McQuitty, 2004). The analyses were run according the following procedure. An initial model was computed by entering all exogenous, endogenous, and control variables into a structural model according to the hypothesized structure (initial model). Any variable that did not demonstrated a significant path was dropped, beginning from the most proximal to the exogenous variable to the most distal. To improve overall model fit (final model), measurement and residual errors were allowed be correlated, but only if they did not modify the results of the structural model. To assess mediation, it was verified whether a previously significant relation between two variables approached zero, once controlling for a third variable (Baron & Kelly, 1986).

Results

Model A (TPB only). According to hypotheses 1 to 2d, suggestion-making behaviour is predicted by the Theory of Planned Behaviour. Initial model A was estimated using behaviour as exogenous variable; intention, attitudes, norms, and self-efficacy as endogenous variables; and gender, age, years of employment at TMMK, education, ethnicity, and questionnaire version as controls. Overall, the initial model fit was adequate, $\chi^2(220, N = 446) = 720.24$, $p < .001$, CFI = .91, RMSEA = .07 (Hu & Bentler, 1999). Hypothesis H2d (self-efficacy- behaviour) was not supported ($\beta = .04$, n.s.). Of the control variables, none was related to behaviour. "Years of employment" was found significantly related to intention ($\beta = -.08$, $p < .05$). The final model fit (figure 3) was adequate, $\chi^2(122, N = 446) = 461.28$, $p < .001$, CFI = .94, RMSEA = .08. The following hypotheses have been supported: H1 (intention-behaviour; $\beta = -.21$, $p < .001$), H2a (intention-attitudes; $\beta = .55$, $p < .001$), H2b (intention-norms; $\beta = .37$, $p < .001$), H2c (intention-self-efficacy; $\beta = .12$, $p < .01$). In terms of percent variance accounted for (R^2), the model predicted 46% of the variance in intention and 5% of the variance in behaviour. Figure 2 presents final structural model A and its standardized regression weights.

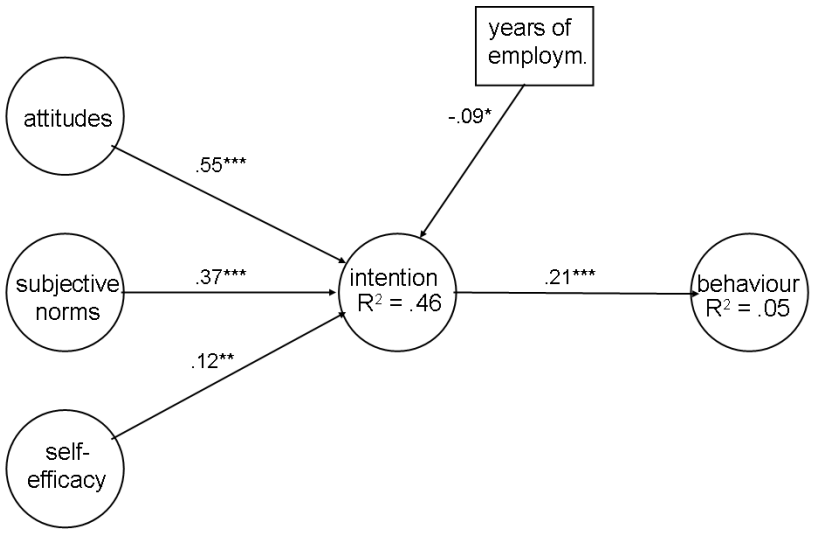

Figure 2. Final Model A (TPB Only): Standardized Path Coefficients.
**p* < .05; ***p* < .01; ****p* < .001

Model B (full model). Initial model B was estimated using behaviour as exogenous variable; intention, attitudes, norms, self-efficacy, proactivity, trust, rewards, and supervisory support as endogenous variables; and gender, age, years of employment at TMMK, education, ethnicity, and questionnaire version as controls for behaviour, intention and attitudes. To check for mediation, direct path from proactivity to behaviour and intention have been included (H3), as well as direct paths from trust (H4), rewards (H5), and supervisory support (H6) to attitudes, intention, and behaviour. The initial model fit was fair, $\chi^2(748, N = 446) = 2019.52$, $p < .001$, CFI = .89, RMSEA = .06. Of the control variables, none was related to behaviour and attitudes. "Years of employment" was found significantly related to intention (β = -.12, $p < .01$). The direct path from proactivity to behaviour was found not significant (β = -.00, n.s.). The path from proactivity to intention was instead found significant (β = .19, $p < .001$.). Only the direct path from trust to attitudes was found significant (β = .25, $p < .001$.), but not the path from trust to intention (β = -.05, n.s.) and the path from trust to behaviour (β = -.02, n.s.). Similarly, only the direct path from rewards to attitudes was found significant (β = .45, $p < .001$.), but not the path from rewards to intention (β = -.02, n.s.) and the path from rewards to behaviour (β = -.02, n.s.). The same pattern worked with supervisory support. The direct path from supervisory support to attitudes was found significant (β = .14, $p < .01$.), but not the direct paths from supervisory support to intention (β = -.02, n.s.) and to behaviour (β = .06, n.s.). The results provided support to hypotheses H3, H4, H5 and H6. The final model fit was adequate, $\chi^2(580, N = 446) = 1671.49$, $p < .001$, CFI = .90, RMSEA = .07. Overall, the model predicted 29% of the variance in attitudes, 38% of the variance in intention and 4% of the variance in behaviour. Figure 3 reports final structural model B and its standardized regression weights.

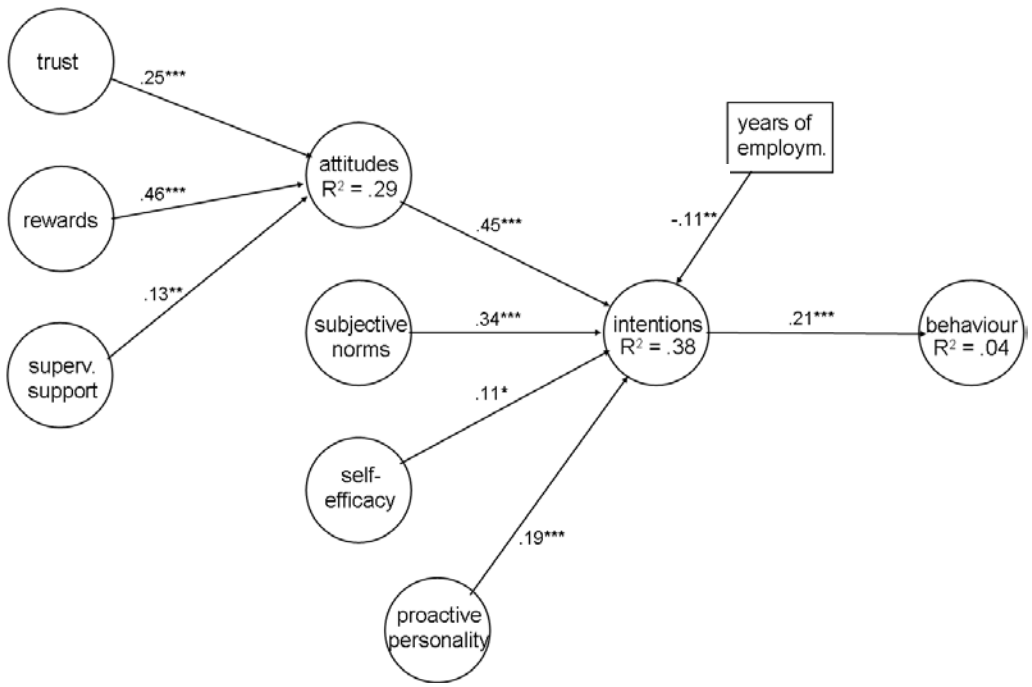

Figure 3. Final Model B (Full Model): Standardized Path Coefficients.
**p* < .05; ***p* < .01; ****p* < .001

Conclusions

The present study was designed to test a model of employees' suggestion-making behaviour. In model A (figure 2), the direct antecedents of suggestion-making behaviour has been examined using TPB (Ajzen, 1991). In models B (figure 3), the indirect effects of other constructs have been taken into account. The findings indicated that TPB alone can be used to explain and to predict employee participation in suggestion systems. As expected, intention to submit suggestions predicted actual participation in the suggestion system. Although the percent of variance accounted for was slim (R^2= .05; final model A), it should be reminded that the model was put to a very narrow test. In fact, "approved suggestions" has been used as exogenous variable, namely employees' recommendations that have been recognized as being worth implementation. Attitudes, perceived norms, and self-efficacy explained a more substantial percent of variance in intention to submit suggestions (R^2= .46).

Model B provided evidences to support the idea that TPB offers a good theoretical framework that can integrate previous contributions on suggestion-making behaviour. It was beyond of the scope of this study to take into consideration each variable used in past research. The present exploration was limited to four constructs: Proactive personality, perceived adequacy of the rewards, trust toward management, and supervisory support to continuous improvement activities. While these four constructs were previously assumed to have a direct effect on employees' behaviour, it has been here showed that TPB variables mediate the effects of these constructs on suggestion-making behaviour. As hypothesized, the effect of proactive personality on behaviour was fully mediated by intention. Similarly, the effects of supervisory support, organizational trust, perceived rewards on behaviour were mediated by attitudes. Overall, these findings are relevant in an effort of integrating different levels of analysis, as many commentators have recommended (Anderson, De Dreu, & Nijstad, 2004).

Limitations, unexpected findings, and managerial implications. Several limitations need to be addressed in future research. For instance, the response rate was quite low (9.1%). One of the possible reasons of such low return rate was that participants were required to provide identification information to assess the predictive power of the model. This requirement may have been perceived by employees as an unobtrusive way to collect personal opinions on management's behalf. A second limitation of this study involves the generalizability of its results. Future research is needed to test for cross-national generalizability and cultural differences. Also, it was not possible to verify a possible selection bias, because the monthly participation rate for the entire population was not comparable with the available three-month participation rate of the sample. Therefore, the risk that the final sample may have overrepresented employees who are more active in the suggestion system cannot be ruled out. More effective checks for selection bias should be implemented in future research. A fourth limitation emerges from the low percent of variance explained in participation in the suggestion system. The percentage accounted for by the present model was slim (R^2= .05; final model A), probably because of the use of "approved suggestions" as exogenous variable. It is expected that more variance can be accounted for in future research that will use the mere "number of suggestions" as outcome variable.

The difference between "suggestions" and "approved suggestions" is an important area where more research is needed. Some participants reported during informal interviews that the procedure for evaluating employees' recommendations changed at TMMK a couple of years earlier. Because of such change, many employees complained that fewer recommendations are now implemented and consequently rewarded. This change may explain the major unexpected finding of the present research, namely that years of employment at TMMK was negatively related to intention to submit suggestions ($\beta = -.09$, $p < .05$). It is generally given for granted that suggestions are evaluated in a fair and rational manner. Nonetheless, this is a major management-biased assumption (Deetz, 2001). Future research should provide insights on the decision-making process involved in the selection of employees' recommendations that are worth implementation by management.

Managerial implications. The results of the present research contributed to improve our theoretical understanding of employees' participation in suggestion systems by addressing some of the major limitations of past research. This study has also relevant implications for managers and practitioners that seek to design interventions to improve suggestion systems in their companies. Employees' personal initiative and perceived ability to master the procedure to submit suggestions appear to play a role in predicting employees' suggestion-making behaviour. According to our findings, an increase in the overall attitudes toward submitting suggestions appears to be the most effective way to stimulate employee participation. In this sense, supervisory support of continuous improvement activities and the degree of trust employees have in their organization are relevant factors, as well as the presence of a reward system which should provide an adequate and fair stimulus to support workers' discretionary effort. By offering useful information to pinpoint the strengths and weaknesses of a suggestion system, it is hoped that our model will both support organizations in enhancing their suggestion schemes and provide a relevant contribution in making workplaces more open to employees' opinions and ideas.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*, 179-211.

Anderson, N., De Dreu, C. K. W., & Nijstad, B. A. (2004). The routinization of innovation research: A constructively critical review of the state-of-the-science. *Journal of Organizational Behavior, 25*, 147–173.

Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. L. (2000). *Manufacturing advantage: Why high-performance work systems pay off*. Ithaca, NY: ILR Press.

Armitage, C. J., & Conner, M. (1999). Predictive validity of the theory of planned behavior: The role of questionnaire format and social desirability. *Journal of Community & Applied Social Psychology, 9*, 261-272.

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology, 13*, 623-649.

Axtell, C. M., Holman, D. J., Unsworth, T. D., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestions and implementation of ideas. *Journal of Occupational and Organizational Psychology, 73*(3), 265-285.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: W.H. Freeman.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182.

Bateman, T. S., & Crant, J. M. (1993). The proactive component of organizational behavior: A measure and correlates. *Journal of Organizational Behavior, 14*(2), 103–118.

Clegg, C., Unsworth, K., Olga, E., & Parker, G. (2002). Implicating trust in the innovation process. *Journal of Occupational and Organizational Psychology, 75*, 409-422.

Conner, M., & Abraham, C. (2001). Conscientiousness and the theory of planned behavior: Toward a more complete model of antecedents of intentions and behavior. *Personality and Social Psychology Bulletin, 27*(11), 1547-1561.

Cook, J., & Wall, T. (1980). New work attitude measures of trust, organizational commitment and personal need non-fulfilment. *Journal of Occupational Psychology, 53*, 39-52.

Coyle-Shapiro, J. A. M. (2002). Changing employee attitudes: The independent effects of TQM and profit sharing on continuous improvement orientation. *The Journal of Applied Behavioral Science, 38*(1), 57-77.

Crant, J. M. (2000). Proactive behavior in organizations. *Journal of Management, 26*(3), 435-462.

Deetz, S. (2001). Conceptual foundations. In F. E. Jablin & L. L. Putnam (Eds.), *The new handbook of organizational communication: Advances in theory, research, and methods* (pp. 3-46). Thousand Oak, CA: Sage.

Dirks, K. T., & Ferrin, D. L. (2001). The role of trust in organizational settings. *Organization Science, 12*(4), 450-467.

Frese, M., Teng, E., & Wijnen, C. J. D. (1999). Helping to improve suggestion systems: Predictors of making suggestions in companies. *Journal of Organizational Behavior, 20*(7), 1139-1155.

Fuller, U., Helbling, C., & Cooley, R. (2002). Suggestion schemes as information and knowledge management system. In B. Howell & G. Orange (Eds.), *Proceedings of the 7th annual UKAIS conference "Information systems research, teaching and practice," Leeds*

Metropolitan University, England, UK (pp. 226-234). Leeds, UK: Leeds Metropolitan University.

Hackman, J. R., & Wageman, R. (1995). Total Quality Management: Empirical, Conceptual, and Practical Issues. *Administrative Science Quarterly, 40*(2), 309-342.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55.

Lipponen, J., Bardi, A., & Haapamäki, J. (2008). The interaction between values and organizational identification in predicting suggestion-making at work. *Journal of Occupational and Organizational Psychology*, 81, 241–248.

McQuitty, S. (2004). Statistical power and structural equation models in business research. *Journal of Business Research, 57*, 175– 183.

Midgley, C., Maehr, M. L., Hruda, L., Anderman, E. M., Anderman, L., & Freeman, K. E. (2000). *Manual for the patterns of adaptive learning scales (PALS).* Ann Arbor, MI: University of Michigan.

Morrison, E. W., & Phelps, C. C. (1999). Taking charge at work: Extra role efforts initiate workplace change. *Academy of Management Journal, 42*(4), 403-419.

Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal, 39*(3), 607-634.

Rapp, C., & Eklund, J. (2002). Sustainable development of improvement activities-the long-term operation of a suggestion scheme in a Swedish company. *Total Quality Management, 13*(7), 945-969.

Robinson, A. G., & Schroeder, D. M. (2004). *Ideas are free: How the idea revolution is liberating people and transforming organizations*. San Francisco, CA: Berrett-Koehler Publishers.

Spector, P. E. (1997). *Job Satisfaction: Application, Assessment, Causes, and Consequences*. Thousand Oaks, CA: Sage Publications.

Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin, 124*, 709-725.

Sutton, R. I., & Staw, B. M. (1995). What theory is not. *Administrative Science Quarterly, 40*(3), 371-384.

Wood, A. (2003). Managing employees' ideas. From where do ideas come? *Journal for Quality & Participation, 26*(2), 22-26.