

Employee Innovation:  
The Roles of Idea Generation and Idea Implementation

Kerrie L. Unsworth, Hilary Brown, & Lauren McGuire  
Institute of Work Psychology  
University of Sheffield  
Sheffield, S10 2TN  
United Kingdom

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Abstract

This study tested the hypothesis that motivation, job competence and creative personality indirectly influenced innovation via idea generation. Results showed that the effects of creative personality and motivation on innovation were, indeed, mediated. It is proposed that innovation is not a unitary construct, but one that is composed of at least two stages.

Creativity and innovation both represent large bodies of accumulated knowledge and have provoked considerable research and theoretical efforts. Yet, the relationship between the two constructs has caused much confusion within the literature. Creativity is generally seen as the generation of ideas (e.g., Amabile, 1983), however, sometimes the terms are used synonymously (e.g., Basadur, 1997), sometimes innovation is treated as if concerned only with the implementation of ideas (e.g., Damanpour, 1991) and sometimes innovation is taken to represent both the generation and implementation of ideas (e.g., Van de Ven, 1986). Most psychological theorising, however, tends to emphasise the latter. This study explored a model of innovation explicitly testing this hypothesis.

While the concept of innovation as involving both the generation and the implementation of ideas is not a new one (e.g., Mumford and Gustafson, 1988) these theoretical suggestions have mostly gone unheeded in empirical tests of innovation. Most operationalisations of innovation involve measuring only successful implementations of ideas (e.g., Bunce & West, 1994; Damanpour, 1991; West, 1987). While the behaviours measured by these operationalisations may implicitly require some form of idea generation, only explicit measurement of each stage will enable us to capture the true picture.

The model tested in this paper explicitly addresses these concerns by measuring not only implementation of ideas, but also idea generation itself. Amabile's (1982, 1988) componential model of creativity provides the framework for the study. Amabile proposes three components necessary for individual innovation: domain relevant skills (e.g., job competence); creativity relevant skills (e.g., creative personality traits); and intrinsic task motivation. This model has been successful in predicting creativity in engineers (Amabile & Gryskiewicz, 1987), children (Amabile, Hennessey & Grossman, 1986), artists (Amabile, 1979), and writers (Amabile, 1985). It is hypothesised that these variables will have an indirect

influence on the number of ideas implemented by the participants, mediated by the extent to which the participants generate ideas.

In summary, the present study aims to further understanding of employee innovation. It will separate two different processes involved in innovation, namely idea generation and idea implementation, and will test the relationship between the two. Innovation is hypothesised to be influenced, via the mediating effect of idea generation, by creative personality, job competence and intrinsic motivation.

### Method

As part of a larger project on innovation and creativity (see Brown, 1998; McGuire, 1998), questionnaires were postally distributed to 650 employees from two public and two private sector organisations, enclosed with a letter of introduction from the organization. Participants were assured of confidentiality and the researchers' independence from the organisation.

The measure of intrinsic motivation addressed the motivation of employees in terms of the sense of personal achievement and pride they derive from "a job well done" (Warr, Cook & Wall, 1979). The measure showed an adequate alpha coefficient of reliability ( $\alpha=0.68$ ).

Warr's (1990) Reported Job Competence scale assessed the extent to which the employee had the knowledge, skills and psychological resources necessary for coping with their job. Its alpha coefficient for internal reliability was 0.70.

The creative personality scale was adapted from Gough's (1979) Adjective Check List. Gough's original list contained 18 adjectives positively related to creative personality and 12 adjectives negatively related. As the adjectives negatively related to creative personality are

also negative in a wider social context (e.g., commonplace, dissatisfied, suspicious), only the positively related items were used to measure creative personality. Additionally, two other adjectives (sexy and snobbish) were deemed irrelevant and distracting to the participants; these adjectives were deleted from the measure. Therefore, a 16 item measure was used asking participants to indicate the extent to which each of the adjectives described them. The alpha reliability coefficient for this adjusted scale was 0.84.

Two dependent variables were measured: idea generation and innovation. Due to the length of the questionnaire, idea generation was reduced to a one-item, five-point Likert-type measure taken from Bunce & West's (1995) Propensity to Innovate Scale ("I have ideas which would significantly improve the way the job is done"). A five item measure used by Wall et al. (in press) was used to measure level of innovation. It assessed the degree to which employees introduced changes in various aspects of their work. The internal reliability of this scale was 0.89. In order to counteract the possible bias resulting from these self-report scales, respondents were asked to name their three most significant innovations and rate these on measures of effectiveness and impact.

## Results

Of the 650 questionnaires posted, 331 were returned; a response rate of 51.4%. These respondents came from a variety of occupational groups including middle managers (51%), professional staff (23%), and support staff (26%). Respondents were mainly male (65%), graduates (59%), with a mean age of 39 and a mean organisational tenure of 9.68 years. Preliminary analysis identified no multivariate outliers, nor any significantly skewed variables. Table 1 details means, standard deviations, reliabilities, and intercorrelations of the measures.

Table 1 about here

Before testing the hypothesis, the validity of the self-report scale of innovation was examined. A correlation was performed between the scale and the number of innovations listed in the subsequent question. As the latter variable was limited to values of either zero, one, two, or three, the correlation represented a very crude and conservative measure of validity. Nevertheless, the correlation obtained was 0.49 ( $p < .001$ ), thus adding validity to the self-report scale.

Following Baron & Kenny's (1986) recommendations for analysing a mediation effect, the following relationships were ascertained: mediating variable on the independent variables (idea generation and creative potential, intrinsic motivation and job competence); dependent variable on the independent variables (innovation and creative potential, intrinsic motivation and job competence); and finally, dependent variable on the independent variables and mediating variable (innovation and creative potential, intrinsic motivation, job competence and idea generation). An inspection of the correlation table showed positive bivariate relationships between all hypothesised variables except job competence and innovation. As this relationship is a crucial marker of mediation, the hypothesis that idea generation mediates the relationship between job competence and innovation was rejected.

The remaining independent variables underwent the regression analyses outlined in Table 2. Creative personality was significantly related to idea generation ( $R^2 = .14$ ,  $p < .001$ ). It also accounted for a significant 8.5% of the variance in innovation with a beta weight of .29. When idea generation was added to the innovation equation, the  $R^2$  increased to 20.4% of the variance. Although the beta weight for creative personality was reduced to .15, it was still significant at the .05 level. Thus, idea generation partially mediated the effect of creative personality on innovation.

## Table 2 about here

Intrinsic motivation was significantly related to idea generation ( $R^2=.02$ ,  $p<.01$ ). It also accounted for a significant 1.6% of the variance in innovation where it carried a beta weight of .13. When idea generation was included in this innovation equation, the  $R^2$  increased to 18.9% of the variance. The beta weight for intrinsic motivation was reduced to .07 and was nonsignificant. Thus, idea generation mediated the effect of intrinsic motivation on innovation.

## Discussion

This study tested the hypothesis that predictors of employee innovation were mediated by idea generation. This hypothesis met with some degree of success. While job competence was not related to employee innovation at all, the effects of intrinsic motivation were found to be completely mediated via idea generation and creative personality influenced innovation both directly and indirectly.

Therefore, it is proposed that innovation is not a unitary construct, but one that is composed of at least two stages. Innovation is a process that includes both generating ideas and taking action to implement them. What facilitates each of these stages, as well as the movement from generation to implementation is a question that only further research can answer fully.

Amabile's (1982, 1988) model of componential creativity also received some support. Intrinsic motivation and creative personality were related to both idea generation and innovation. The nonsignificant relationship between job competence and innovation may be the result of ambiguous operationalisation or the low reliability of the measure rather than a true reflection on the model. However, job competence was significantly related to idea generation.

This raises the possibility that each stage of the innovation process may be enhanced by different factors. Future research should aim to address this question.

The limitations of this study are ones that occur most frequently in organisational literature. Self-report items were used; however, the measures of innovation were found to be highly correlated with the number of actual innovations the employee reported. Thus, the self-report scale is, to some extent, measuring the domain correctly. Secondly, the study was of a cross-sectional design. Future research should look at the issue of employee innovation at a longitudinal level employing both quantitative and qualitative methods. Finally, the one-item measure of idea generation was not ideal as it cannot be assessed for either validity or reliability. As this study was part of a larger exercise, however, this situation could not be remedied. Again, this is a matter for future research.

This study has highlighted the need for greater understanding of employee innovation. There is little previous research testing models of individual innovation and even less examining innovation in the workplace. Although this paper relied on a one-item measure of idea generation and a small number of subjects we were able to distinguish the differences between idea generation and implementation. This is an important and necessary step in understanding the determinants and process of innovation. Nevertheless, this paper is but a small step - much more in-depth qualitative and quantitative research is needed before we can begin to fully understand this phenomenon.



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Table 1. Means, Standard Deviations, Reliabilities and Intercorrelations of Variables.

|                         | Mean (SD)  | Alpha Coef. | 1.   | 2.     | 3.     | 4.     |
|-------------------------|------------|-------------|------|--------|--------|--------|
| 1. Intrinsic Motivation | 4.56 (.43) | .68         |      |        |        |        |
| 2. Creative Personality | 3.51 (.39) | .84         | .02  |        |        |        |
| 3. Job Competence       | 3.65 (.62) | .79         | -.06 | .21*** |        |        |
| 5. Idea Generation      | 4.01 (.64) | -           | .14* | .36*** | .21*** |        |
| 6. Innovation           | 3.49 (.87) | .89         | .11* | .25*** | .09    | .41*** |

\* p<.05, \*\* p<.01, \*\*\* p<.001

Table 2. Mediation Regressions of Innovation and Idea Generation on Creative Personality and Intrinsic Motivation.

| STEP ONE: Idea Generation on Creative Personality, Intrinsic Motivation                  |        |                |                            |
|--|--------|----------------|----------------------------|
| Predictor Variable   | Beta   | R <sup>2</sup> | Significance of Regression |
| Creative Personality   | .38*** | .14            | F(1,328)=53.98, p<.001     |
| Intrinsic Motivation   | .14**  | .02            | F(1,328)=6.88, p<.01       |
| STEP TWO: Innovation on Creative Personality, Intrinsic Motivation                       |        |                |                            |
| Predictor Variable   | Beta   | R <sup>2</sup> | Significance of Regression |
| Creative Personality   | .29*** | .08            | F(1,324)=30.19, p<.001     |
| Intrinsic Motivation   | .13*   | .02            | F(1,324)=5.19, p<.05       |
| STEP THREE: Innovation on Idea Generation and Creative Personality, Intrinsic Motivation |        |                |                            |
| Predictor Variable   | Beta   | R <sup>2</sup> | Significance of Regression |
| Idea Generation  | .37*** |                |                            |
| Creative Personality   | .15**  | .20            | F(2,323)=41.59, p<.001     |
| Idea Generation  | .42*** |                |                            |
| Intrinsic Motivation   | .07    | .19            | F(2,323)=37.70, p<.001     |

\* p<.05, \*\* p<.01, \*\*\* p<.001