

THE RELATIONSHIP BETWEEN JOB INVOLVEMENT, INTRINSIC MOTIVATION
AND SUGGESTION BEHAVIOR

A Thesis
Presented to
the Faculty of the Department of Psychology
University of Houston

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

By
Charles W. DeBettignies
May 1986

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ABSTRACT

This study was undertaken to investigate: (1) the relations between the job involvement and intrinsic work motivation of hourly workers, and the number of cost saving ideas they generate; and (2) the impact of hourly workers willingness to submit their ideas on the relationship between the number of ideas they generate and the number of ideas they formally submit as suggestions. Participants were 304 hourly workers in a furniture manufacturing plant in the Northeast. Job attitude data was collected by survey. Data for the variable suggestion contribution was calculated from detailed company records of the suggestions submitted by the employees over the 26 month period following survey administration. A log transformation of the suggestion data was included in the analyses.

Both job involvement and intrinsic work motivation were positively correlated with idea generation. Idea generation was found to be significantly correlated to both suggestion contribution and the log transformation of suggestion contribution. The willingness of employees to submit their ideas was found to moderate

the strength of the relationship between idea generation and suggestion contribution, but not the form of the relationship between idea generation and suggestion contribution.

It was suggested that future investigations of employee creativity keep in mind the important role of the involvement of the employee in the process of generating suggestions. It was also suggested that future research consider the willingness of employees to submit ideas as a critical aspect of the creative process. It was noted that failure to consider the potential impact of employee willingness to submit ideas could lead to a failure to find relationships where they actually exist.

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CHAPTER I

INTRODUCTION

Formal suggestion systems are currently popular among organizations that wish to stimulate and utilize the creative talents of all employees (Bailey et al., 1980; Dwyer, 1974; Kafka, 1975; Ekvall, 1976; Myers, 1976; Bergerson, 1977). Ideas are sought to increase profits and productivity, improve product quality, and reduce costs of all types. The contribution of ideas by employees has also been thought to increase feelings of employee involvement or participation - that their input can have a lasting impact on the way things are done in their place of employment (Bailey et al., 1980; Bergerson, 1977).

One of the most popular ways that organizations tap the innovative abilities of their employees is through formal suggestion systems. Organizational suggestion systems are defined by Ekvall (1976) as "an administrative procedure for collecting, judging, and compensating ideas for improvements conceived by the employees" (p. 52). These systems channel input from the people who are intimately familiar with the details

and procedures of their jobs, many of whom have become experts at their particular job duties. The suggestion system becomes a formal communication vehicle for the job incumbents to express ways in which their jobs could be performed faster, at a lower cost or with an improved output (Bailey et al., 1980). As noted by Driver (1980) upward communications in organizations frequently require assistance. Formal suggestion systems provide the people in lower parts of the organization with a means by which to communicate their ideas upward. The incumbents suggestions provide information into the organization as a system that can serve as feedback (Myers, 1976). This feedback can serve as a control and coordination mechanism that links various parts of the organization together into a synchronized pattern.

Formal suggestion systems can and do lead to big payoffs for both employees and employers. Several case examples indicate the potential impact that suggestion systems can have. At the Bank of America 2,785 employees have been awarded cash prizes ranging from \$50 to \$5,000 for suggestions they submitted. The director of the suggestion program reported that pretax profit generated by employee suggestions has been in

excess of a half million dollars per year, where pretax profit here is the increase in operating revenues minus the increase in operating costs, including implementation costs (Bailey et al., 1980).

The monetary outcomes of a formal suggestion system for both the employer and employees has also been high at The Pacific Gas and Electric Company in San Francisco, California. From the 20,000 employees eligible for dollar awards, over 4,000 suggestions are received by the company annually. For the year 1979, the Pacific Gas and Electric Company reported over \$500,000 in net savings. Savings computed since the suggestion plan's inception in 1923 totaled over \$90 million, considering an average five year life span for every tangible idea (Bailey et al., 1980).

George Eastman, successful inventor and founder of the Eastman Kodak Company was a firm believer that the success of a business enterprise was dependent upon the constructive thinking of everyone involved in the company (Bergerson, 1977). The Eastman Kodak Company established a formal suggestion system in 1898, which is still in operation today. Their suggestion system is the oldest continuously operated suggestion program in the United States (Bailey et al., 1980). Since the

program's inception, 1.8 million suggestions have been submitted, 600,000 of which have been adopted. At the present time Kodak employees receive more than \$1.5 million per year for the contribution of their ideas.

Quality circles extend the rationale underlying suggestion systems. The philosophy behind suggestion systems postulates that the job incumbent is the expert concerning the details of how a specific job could be improved. Quality circles typically have between 5 to 10 members (Sasaki & Hutchins, 1984) and meet together periodically (e.g., every week or month) to discuss problems encountered on the job and possible solutions to these problems. Quality circles are particularly valuable because they tap the ideas of employees in a group setting where points made by one or more group members can spark additional ideas in other group members. A central goal of quality circles is to increase the involvement of employees in organizational problems and the potential control employees have over their jobs. They can also facilitate the employee's understanding of the problems faced by management and inspire a group effort toward the achievement of organizational goals.

As noted above, both organizational suggestion

systems and quality circles are means by which companies can promote and tap the ideas of employees. Increasing interest in fostering employee innovation has been expressed by a number of companies, as positive impact on bottom-line profitability has been demonstrated. A variety of studies have posited various organizational characteristics as being positively related to employee innovation, such as: lateral communication (Lawrence & Lorsch, 1967); creative bottom-up planning, innovation-oriented incentives (Miles & Snow, 1978); and organizational norms that encourage employee innovation (Peters & Waterman, 1982). This study will investigate the relationship between several aspects of worker's orientation to their jobs and employee innovation.

The central purposes of this study are fourfold: (1) to investigate the relationship between job involvement and idea generation; (2) to investigate the relationship between intrinsic work motivation and idea generation; (3) to investigate the impact of a workers willingness to submit their ideas on the relationship between the number of ideas they generate and the number of ideas they formally submit as suggestions; and (4) to explore creativity among blue-collar

workers. Much of the research that has been published concerning creativity in organizations has involved professional innovators such as engineers and scientists. The innovation of blue collar workers in their own jobs has been, to date, largely unexplored.

Job involvement has been a prominent topic in organizational research and hundreds of studies have been published that explore the relationship between job involvement and other organizational variables (Rabinowitz & Hall, 1977). Although the concepts of job involvement and creativity have received individual attention in the literature the relationship between the concepts has never been explored. The first of several job attitudes that will be investigated in in terms of their relation to employee innovation is job involvement.

Concept of Job Involvement

Job involvement has been defined in the literature primarily in two different ways: (1) as a performance-esteem contingency, and (2) as a component of self-image.

Performance-esteem contingency. A definition provided by French and Kahn (1962) exemplifies the

performance-esteem contingency view of job involvement. They noted that the dimensions used by a person in perceiving themselves and others vary in their importance to the person. That is, all dimensions are not of equal importance. These dimensions may vary in their centrality, which is defined as the degree to which they determine the person's self-esteem. Where the worker's ability to produce is a dimension that is high in centrality, the actual performance utilizing this ability is defined as ego-involved performance, and the worker is seen as ego-involved in their job.

Vroom (1962) defined ego involvement in a job task as the extent to which self-esteem is affected by perceived level of performance. He reasoned that those who are ego-involved in their jobs will be more highly motivated to perform effectively because their self-esteem is directly affected by evaluations of their level of performance. Vroom (1962) predicted that because the self-esteem of workers who are ego-involved with their jobs is directly related to the evaluation of their performance, these workers will be more highly motivated to perform effectively on the job than those who are not ego-involved. He hypothesized that this higher level of motivation would translate

into effective job performance in the absence of barriers to performance. Vroom reported support for this hypothesis in terms of a significant positive correlation between ego-involvement and job performance in an electronics manufacturing organization. Klauser (1951) found similar results in a laboratory experiment in which one group of employees received ego-involving instructions for a learning task and the other received task-oriented instructions. The employees in the ego involvement group were told that the task they would be performing was a test of their perceptual intelligence, which was an important component of general intelligence. The employees in the task oriented group were told that the task they would be performing was simply a learning test, and that their performance was to be a classroom demonstration of this learning test. He reported that the ego-involved group was superior in performance and speculated that this difference in performance was due to an increased drive level brought about by ego-involvement.

Component of self-image. Job involvement has also been defined as a component of self-image. Two different definitions of job involvement were presented by Lodahl and Kejner (1965), the first of which

conceptualizes job involvement as a component of self-image. In the abstract of their article they defined job involvement as "the degree to which a person is identified psychologically with his work, or the importance of work in his total self-image" (p. 24). They describe the job-involved person as one for whom work is a very important part of life, and as one who is affected very much personally by their whole job situation: the work itself, the company, his or her co-workers, etc. They note that on the other hand, the non-job-involved worker does his or her living off the job. Work is not as important a part of his or her psychological life (p. 25). In the body of their article, Lodahl and Kejner presented a different definition of job involvement. This definition stated that job involvement was "the degree to which a person's work performance affects his self-esteem" (p. 25). These two definitions are very different and as Kanungo (1979) notes, Lodahl and Kejner made no attempt to show how the two definitions are related. The questionnaire measure of job involvement developed by Lodahl and Kejner is widely used and contains items that reflect both definitions, rendering data that is difficult to interpret. In order to achieve conceptual

clarity it is necessary to specify conceptual boundaries - what a concept is, and what it is not. Inadequate or inappropriate measurement techniques are often the result of a lack of conceptual clarity (Schneider and Reichers, 1983); this has been the case with job involvement. The confusion and ambiguity resulting from the widespread use of Lodahl and Kejner's questionnaire measure of job involvement was noted in critical reviews of the job involvement literature by Rabinowitz and Hall (1977) and Kanungo (1979). Additional points concerning the confusion resulting from the widespread use of the Lodahl and Kejner (1965) scale will be discussed below.

Concept of Intrinsic Work Motivation

Lawler and Hall (1970) helped to clarify the conceptual confusion concerning job involvement by distinguishing the concept of job involvement from intrinsic motivation. Following a definition presented by Lawler (1969) they described intrinsic job motivation as the degree to which an individual is motivated by internally-mediated rewards that stem directly from job performance. As Lawler (1969) noted, these rewards could be conceptualized as satisfying higher order needs such as self-esteem, and

self-actualization. They also frequently include feelings of accomplishment, achievement, and of using and developing one's skills and abilities. Thus, they argued that the performance-esteem contingency definition of job involvement was actually the degree to which the person is internally motivated to perform their job well and therefore was actually a form of intrinsic motivation. In their efforts to distinguish the concepts of job involvement and intrinsic motivation they defined job involvement as the degree of psychological identification with one's work or the degree to which the job situation is central to the person and their identity (Lodahl & Kejner, 1965) and intrinsic motivation as the degree to which attaining higher order need satisfaction depends upon performance. Lawler and Hall (1970) provided empirical support for their contention that intrinsic work motivation and job involvement, as defined in their study, are separate and distinct concepts. They did a factor analysis of questionnaire data collected from 291 scientists and found that job involvement and intrinsic work motivation loaded on different factors. They concluded that job involvement defined as psychological identification with one's work was a

distinctive job attitude that should be considered as conceptually and empirically separate from intrinsic motivation attitudes.

To summarize, there is a lack of conceptual clarity regarding the definition of job involvement. Some studies define job involvement as a performance-esteem contingency, and others define it in terms of psychological identification with one's job. The use of two very different definitions for the same concept has led to a lack of conceptual clarity concerning what job involvement is and what it is not. The definition of job involvement provided by Lawler and Hall (1970) provides a solution to the conceptual ambiguity that has resulted from the widespread use of two different definitions for the same concept.

This study uses the definition of job involvement used by Lawler and Hall (1970) and Rabinowitz and Hall (1981), which defined job involvement in terms of a person's psychological identification with their work, and the degree to which the job situation is central to the person and his identity. This definition will be used because the author agrees with Lawler and Hall (1970) that the performance-esteem contingency definitions of job involvement are actually measuring a

"type of intrinsic motivation, that is, intrinsic motivation which is based upon self-esteem" (Lawler & Hall, 1970, p. 306). The use of Lawler and Hall's definition of job involvement and distinction between job involvement and intrinsic motivation provides a resolution to the confusion that has existed in the literature regarding what the proper theoretical and conceptual definition of job involvement should be. The distinction proposed by Lawler and Hall (1970) goes a long way towards resolving the conceptual ambiguity that has existed regarding job involvement.

Not all recent studies incorporating job involvement as a variable have incorporated the distinction proposed by Lawler and Hall (1970) that separates the concepts of job involvement as identification with one's job and intrinsic work motivation. Abdel-Halim (1979) investigated the degree to which individual growth need strength and interpersonal satisfaction moderated the relationship of job enrichment characteristics to intrinsic job satisfaction and job involvement. He used a 12 item version of Lodahl and Kejner's (1965) scale which contains items that relates to both of the definitions of job involvement presented in Lodahl and Kejner's

(1965) article (as discussed above) and thus fail to note and/or utilize the distinction proposed by Lawler and Hall (1970). Ben-Porat (1980) examined the correlations between job involvement, central life interest and job satisfaction. Using a six-item short form of the Lodahl and Kejner (1965) scale, Hollon (1983) investigated the relationships between Machiavellianism and various managerial work perceptions and attitudes, one of which was job involvement. He also used a six-item version of Lodahl and Kejner's (1965) scale. Graddick and Farr (1983) investigated sex differences in organizational commitment and job involvement. They also used a six item short version of Lodahl and Kejner's (1965) scale, and none of these three studies followed Lawler and Hall's distinction.

In using Lodahl and Kejner's (1965) scale (or shortened versions) these studies assume that Lodahl and Kejner have established job involvement as a distinctive concept and have developed an instrument that measures it accurately. But such is not the case, since this repeats the problem noted by Kanungo (1979) and Rabinowitz and Hall (1970), that Lawler and Hall (1970) sought to rectify.

Some recent studies have utilized the distinction proposed by Lawler and Hall (1970). An examination of the correlations between job involvement and job characteristics, job satisfaction, rewards and individual differences, over three career stages (early, mid and late career) was conducted by Rabinowitz and Hall (1981). They used a four-item scale from Lodahl and Kejner's (1965) earlier scale that addressed job involvement as "the degree to which a person is identified psychologically with his work or the importance of work in his total self-image" (Lodahl & Kejner, 1965, p. 24). Moch (1980) examined job involvement and internal motivation among workers who primarily worked alone and do not have strong associations with other workers ("isolates") and worker who tended to work with others and to have strong social associations with other workers ("non-isolates"). He discussed Lawler and Hall's (1970) distinction between job involvement (as psychological identification with one's work) and intrinsic motivation (the extent to which employees gain self-esteem from successful job performance) in his review of the literature. He measured job involvement using items from The Michigan

Organizational Assessment Package (Seashore, Lawler, Mirvis, & Cammann, 1972). These items represent job involvement as psychological identification with one's job, which is in agreement with Lawler and Hall's (1970) definition of job involvement. Moch's results seem to further substantiate Lawler and Hall's distinction in that job involvement was found to be distinctly different from internal motivation. Variables that led to internal motivation did not appear to facilitate job involvement; some of them actually inhibited it" (p. 28). He noted that being rated high in job involvement did not preclude being rated high in internal motivation, or vice versa. His final assessment was that a person's degree of job involvement or internal motivation was highly influenced by the person's orientation toward growth and various factors of the work situation.

Concept of Creativity

One basic question regarding creative acts is whether they are largely the result of special abilities or predispositions that only certain individuals possess. Guilford (1967) posited that creativity is largely the result of certain mental abilities. He asserted that there were two categories

of thought which were especially relevant to creativity. The first category is "divergent-production" (DP) abilities. DP abilities are particularly relevant to the generation of ideas, for example when solving a problem. This category of mental abilities includes a variety of fluency, flexibility and elaboration abilities. The second category consists of "transformation" abilities "which pertain to revising what one experiences or knows, thereby producing new forms and patterns" (p. 8). Guilford posited that creative talents in general are characterized by a disposition towards mental flexibility, that frequently resulted in re-organizations and re-interpretations.

If some people do have a greater predisposition toward creativity than others it could be useful to be able to identify these individuals. A variety of studies have been conducted that investigate the relationship between creative performance in industrial organizations and scores on various creative ability measures. The majority of these studies have employed professional innovators such as scientists and engineers as subjects, as opposed to employees in general. Additionally, nearly all of these studies

have used ratings by supervisors, rather than objective measures of creative performance, as criterion measures.

Barron (1963) administered a battery of 8 tests, including 3 creativity measures developed by Guilford, to a sample of 100 Air Force officers. All tests in the battery were free-response tests that do not present the respondent with alternatives provided by the test maker, but require the respondent to construct their own reply to the particular items. This type of test provides considerable opportunities for self-expression and originality. He obtained a significant positive multiple correlation between supervisory ratings of originality and a composite test score. Barron interpreted this as evidence that inexpensive and efficient evaluation of originality is possible.

Owens (1957) evaluated the concurrent validity of a battery of 4 tests in the discrimination of creative from non-creative machine designers. The four test were: (1) The Power Source Apparatus Test - A motion sequence and power source are specified and respondents are to sketch as many intervening mechanisms as possible; (2) The Application of Mechanisms Test - A

particular mechanism is specified and respondents are to list as many types of machines as possible in which the mechanism might function; (3) The Personal Inventory - This is a type of forced choice inventory which deals with attitudes, personal characteristics, interests, opinions, and experiences. Scoring is done in terms of the number of weighted responses that were typical of the creative machine designer; and (4) The Personal History Form - This test deals with personal background and was scored in terms of the number of weighted responses typical of creative machine designers. All responses are assigned to the same five point scale and differentially weighted in terms of amount and consistency of discrimination. Owens found correlations of .26, .19, .17, and .13 respectively between the tests and supervisor ratings of whether the respondents were creative or non-creative machine designers.

Harris (1960) developed a test of creativity to be used in the selection and placement of engineering personnel. The test was comprised of 3 subscales which provided indications of the respondent's fluency, flexibility, and originality. Concurrent validity was investigated for two groups of engineers, in terms of

the relationship between test scores on the 3 subscales and supervisory evaluations of respondent's ability to produce a number of original ideas. The work of the first group of engineers primarily concerned the development and improvement of automotive fuel pumps, gauges, instruments, air cleaners and other automotive accessory equipment. Significant validity coefficients for the flexibility and originality subscales were obtained for the first group of engineers, the correlations being .47 and .57 respectively. The work of the second group of engineers dealt primarily with the development of new machines and procedures to manufacture products. In this second group of engineers significant validity coefficients of .39 and .31 were obtained for the fluency and flexibility subscales respectively.

Bergum (1973) used a 22 item questionnaire to discriminate between "creators" and "others" among industrial employees, and analysts and innovators within the creative group. Respondents were classified as "creator" if their work was comprised of research activities and as other if not. Within the "creator" category, respondents were classified as "analysts" if their primary job responsibilities were to refine and

develop fundamental processes closely related to a particular product line, or as "innovators" if they primarily conducted innovative research in areas that were difficult to define in advance. Bergum found that 12 of the 22 items significantly discriminated the various groups. Nine items were found to discriminate the "creators" from the "others", with 2 of these items also discriminating between "innovators" and "analysts." Three other items were found to only discriminate between "innovators" and "analysts."

McDermid (1965) administered a variety of predeveloped instruments to a sample of engineers and evaluated the relationships between these tests and ratings of creativity. The tests included: the California Psychological Inventory, Holland's Vocational Preference Inventory, the Welch Figure Preference test, Chaplin's Social Insight Test, Gough's Adjective Check List, Terman's Concept Mastery Test and the Biographical Information for Research and Scientific Talent forms. He found very low relationships between the paper and pencil tests and ratings of creativity. The biographical information, on the other hand, was significantly related to both supervisor and peer ratings of creativity.

This study will use a definition of creativity proposed by Mednick (1962), who defined the creative thinking process as the formation of associative elements into new combinations that either meet specified requirements or are in some way useful. He stated that the more mutually remote the elements of the new combination, the more creative the process or solution. This study will also employ a distinction proposed by Sanborn (1982). He defined creativity as the act of actually producing a "novel response," and distinguished this from innovation which he defined as the production of a "novel response" that is of use to the organization.

Hypotheses

Hypothesis 1. Job involvement is positively related to idea generation.

It is plausible that individuals who are highly involved with their job tend to think about their work more than individuals who are low in terms of job involvement. In fact, individuals who are low in job involvement may not think about their work even when doing it! Mitchell (1979) presents a similar view of job involvement noting that the concept has long been

regarded as an "orientation toward work which suggests that people think a lot about their job" (p. 250). The elements that an employee combines to form an innovative suggestion could be derived from the work setting, from off-the-job experiences or from both of these areas. Because the highly job involved individual is more likely to be thinking of job related problems or issues in a wider variety of settings, (e.g., at home, while driving, etc.) than the individual who is low in job involvement, they are more likely to utilize a wider variety of inputs that could be combined to form a creative innovation that is useful to their employer. People who are highly involved in their job are more likely to come up with innovative ideas because they are more likely to utilize the wide variety of inputs that is available from their daily experience than would the individual who is low in job involvement. Individuals who are low in job involvement have the same wide variety of inputs available to them as do high job involvement individuals, but they are less likely to utilize this variety of inputs to form an innovative solution to a work related issue because they are less likely to be thinking about work related issues (either when on or

off the job).

Several studies have investigated the relationship between employee creativity and various forms of employee identification in the workplace other than job involvement. Patchen (1970) conducted a study using questionnaire methods in three steam power plants and two engineering design divisions of the Tennessee Valley Authority. Through analysis of the questionnaire data he found that individuals with a "stronger occupational identification did, in fact, show greater interest in work innovation than people who were less strongly identified with their occupations" (p. 238).

Rotondi (1972) reported an investigation of the interrelationships among creativity, organizational identification and occupational identification in a field study of research and development personnel employed at the laboratory research facilities of a large electronics organization. He reported findings using two different samples (one composed of scientists who worked with experimental technology and another composed of product development engineers). In both samples he found a significant negative correlation between creativity and organizational identification

and a significant positive correlation between creativity and occupational identification. Thus, he concluded that creative individuals tended to identify professionally with their occupations, rather than locally with the organizations that employed them. He also reported a significant negative correlation between organizational identification and occupational identification among the sample of scientists. This relationship among the sample of engineers was also negative but was not found to be significant.

Rotondi (1975) investigated the relationships between organizational identification, productivity and creativity. His sample was comprised of 107 nonmanagerial personnel employed at project-oriented research and development laboratory. He found significant inverse relationships between organizational identification and both, effectiveness and creative behavior as measured by objective output in terms of patents and publications. He noted that this constitutes strong evidence that individuals who identify with the organizations that employ them are not likely to demonstrate a marked degree of creativity. These findings reinforced the dysfunctional interpretation of organizational

identification in research and development environments reported by Rotondi (1972) in his doctoral dissertation. In his doctoral dissertation, Rotondi found organizational identification to be directly related to the general personality variables of social isolation, or insecurity in social relationships, and incompetence, as reflected by feelings of inadequate mastery over the self and the environment. Rotondi (1975) also reported a significant positive relationship between creative behavior and effectiveness. He noted that this finding provides empirical support for a view of innovation as a facilitator of goal attainment and environmental adaptation presented by Rosner (1968).

Hypothesis 2. Intrinsic work motivation is positively related to idea generation.

A person may be motivated to generate ideas that resolve work related problems because they believe this will lead to internally mediated rewards, such as the satisfaction of higher order needs such as self-esteem, feelings of accomplishment, and/or using and developing their skills and abilities. For example, a person may view the opportunity to generate ideas that resolve work related problems as a way to develop and utilize

their creative abilities. The opportunity to use and demonstrate their creative abilities could lead to internally mediated rewards such as increased self-esteem, and feelings of accomplishment. According to Lawler (1969), the internal mediation of rewards allows for a more direct link between performance and the reception of rewards than is the case with externally mediated rewards. Therefore, (from the point of view of expectancy theory) internally mediated rewards have the potential to be excellent motivators, because of the higher effort-reward probabilities that can be established for them versus those for externally mediated rewards. Lawler also notes that "for many people rewards of this nature (internally mediated) have a high positive value" (p. 428).

Hypothesis 3. Idea generation is positively related to suggestion contribution.

The generation of creative ideas is not the same as the submission of ideas. The generation of creative ideas involves the formation of associative elements into new combinations or a novel response that either meet specified requirements or are in some way useful (Mednick, 1962). But an employee could have many creative ideas that satisfy Mednick's (1962)

definition, but may fail to communicate these ideas to others. The submission of an idea involves formal communication of ideas by employees to their organizations. The form of this communication may vary from organization to organization. At the site where this study is conducted this formal communication is done by filling out a standardized suggestion form. This form elicits and documents various information regarding the suggestion: the name of the suggestor; summary of the idea; processing history; etc.

It seems plausible that people who generate large numbers of innovative ideas will be more likely to submit a large number of suggestions than people who generate few or no ideas at all. But it could be the case that an individual generates a large number of ideas but, for one reason or another, does not submit them. As Hinton (1970) noted "creative potential becomes creative behavior only under favorable circumstances; potential is a necessary but not a sufficient condition for creative output" (p. 216). The person could fail to submit the idea for a variety of reasons: they may not know how to submit their ideas; they may forget their ideas before taking action to submit them; they may not have time; or they may

simply lack the motivation to do what is necessary to formally submit their ideas. For these or other reasons it may not be the case that those employees who generate the most ideas are also the company's most prolific suggesters.

Willingness to Submit Suggestions. One factor that could have a very profound effect on the relation between the number of ideas that a person generates and the number of suggestions they submit is the person's willingness to formally submit their ideas to their employer. An individual may be unwilling to submit their ideas for a variety of reasons: they might fear rejection of their ideas; they might be afraid coworkers will interpret their submission of suggestions as attempts to curry the favor of management; they might believe their suggestions would never be implemented anyway; or they may believe management will only use suggestions to exploit the workers - taking all resulting profit for themselves.

Unwillingness to submit ideas would have a negative impact on the relation between idea generation and idea submission. The effect of the employee's unwillingness would depend on the degree of unwillingness. If the individual was totally unwilling

to submit ideas the relation between idea generation and suggestion submission would be zero.

Hypothesis 4. Willingness to submit moderates the strength of the relationship between idea generation and suggestion contribution.

To say that willingness to submit suggestions moderates the strength or degree of relationship between idea generation and suggestion contribution implies that the degree of relationship (magnitude of correlation coefficient) is conditional upon the employees willingness to submit their ideas. That is, the relationship between idea generation and suggestion contribution is stronger for employees who are willing to submit their ideas than for those who are unwilling.

Another way to state this hypothesis is that variation in idea generation will account for, or explain, more of the variance in suggestion contribution for employees who are willing to submit their ideas, than for those who are not willing.

Finding that idea generation is related to suggestion contribution, but only at high levels of willingness to submit, would have important implications for future research efforts regarding innovation by blue-collar workers. If willingness to

submit does moderate the strength of the relationship between idea generation and suggestion contribution, this moderating effect of willingness to submit could be an important element in establishing that there is a relationship between idea generation and suggestion contribution. An investigation of the relationship between idea generation and suggestion contribution that did not take into account a true moderating effect of willingness to submit could conclude that there is no relationship between idea generation and suggestion contribution, when in fact there is a true relationship but only at high levels of willingness to submit. As researchers endeavor to establish a nomological network regarding worker innovation, it is important that true relationships between variables be identified. Finding that willingness to submit does moderate the strength of the relationship between idea generation and suggestion contribution would be an important contribution to the efforts to establish a nomological network between variables associated with worker innovation. This finding would establish that idea generation is related to suggestion contribution but only at high levels of willingness to submit.

Hypothesis 5. Willingness to submit moderates the

form of the relation between idea generation and suggestion contribution.

Saying that the variable willingness to submit ideas moderates the form of the relationship between idea generation and suggestion contribution is effectively asserting that there is an interaction between the variables idea generation and willingness to submit ideas in determining the number of ideas contributed. Finding a significant interaction implies that variation in suggestion contribution is a joint function of idea generation and willingness to submit ideas.

An alternative way to state this hypothesis is that a unit change in idea generation will be associated with a greater amount of score difference in suggestion contribution for employees who are willing to submit their ideas than for those who are unwilling.

Finding that suggestion contribution is a joint function of idea generation and willingness to submit suggestions would be a very important outcome for companies who seek to foster suggestion contribution by employees. Such a finding would suggest that efforts to increase the number of suggestions contributed should consider both, the factors that facilitate the

generation of ideas, and factors that enhance employees willingness to contribute the ideas that they have.

CHAPTER II

METHOD

Site and Situation

The study was conducted in a high quality office furniture manufacturing plant in the Northeast with about 1200 employees. A Gainsharing plan, implemented in January, 1979, incorporated two central features: An involvement system and a financial formula. The involvement system consisted of departmental-level facility-wide representative PEP Committee, a Gainsharing Coordinator, an intensive communication program and an employee suggestion system. The PEP committee gets its name from the central concepts of the Gainsharing Program: participation, equity and performance (Bullock & Bullock, 1982). This committee is composed of about 35 appointed managers and elected action team leaders and conducts monthly meetings to implement the central concepts of the program.

The action teams, consisting of a team leader and elected employee representatives, conducted monthly meetings to evaluate suggestions and to promote communication concerning the Gainsharing Program at the

departmental level. The Gainsharing Coordinator facilitates suggestion processing and the day-to-day operation of the plan.

The financial formula is a multi-index formula with six factors: quality, on-time delivery, inventory management, sales and shipments, productivity, and innovation. The Gainsharing Program rewards cost-savings suggestions through bonuses calculated as part of this formula. Group bonuses are earned at three levels: (1) submission of a cost-savings suggestion, (2) approval of the suggestion, and (3) when the suggestion is implemented. One important difference between the Gainsharing Program and traditional suggestion plans is that the total savings achieved from suggestions is divided among all employees, not just those employees who made the suggestions.

Survey process. A survey was administered to all employees in October, 1983 (response rate was 60%). Confidentiality of respondents identity was maintained by identification numbers assigned by, and known only to the research team. The surveys were collected directly by the research team and processed off site, such that no company personnel had contact with the

surveys. The scales used as independent variables were adapted from the Michigan Organizational Assessment Package (Seashore, Lawler, Mirvis, and Cammann, 1982). The survey administered in October, 1983 had previously been administered in May, 1978. Data from both administrations of the survey will be used to compute test-retest reliabilities for the scale items. It should be noted though that since a variety of changes occurred within the organization between the administrations of the survey, the test-retest correlations of the items should be regarded as a lower boundry for the reliability of the scale items, rather than a true test-retest estimate of reliability as presented in classic reliability theory. See Table 1 for the inter-item correlations, Table 2 for descriptive statistics and Table 3 for the survey scale reliabilities.

Table 1

Scale Item Inter-correlations

Scale	Correlations*			
Job Involvement				
1. I am very much personally...	(.31)			
2. I live, eat, and breathe...	.27	(.53)		
3. The most important things...	.27	.54	(.52)	
Intrinsic Work Motivation				
1. I get a feeling of personal...	(.46)			
2. Doing my job well gives...	.49	(.60)		
3. I feel bad when I do...	.32	.48	(.46)	
Idea Generation				
1. From time to time I get...	(.33)			
2. I never get any good...	.33	(.33)		
Willingness to Submit				
1. I would tell somebody...	(.49)			
2. I would not submit...	.44	(.61)		
3. I would never submit...	.39	.57	(.61)	
4. If I had a worthwhile...	.35	.40	.43	(.49)

*(Corrected item totals in diagnals)

Table 2

Scale Descriptive Statistics

<u>Scale</u>	<u>N</u>	<u>Mean</u>	<u>S.D.</u>
Job Involvement			
1. I am very much personally...	298	5.60	1.30
2. I live, eat, and breathe...	293	2.84	1.61
3. The most important things...	293	3.39	1.71
Intrinsic Work Motivation			
1. I get a feeling of personal...	298	6.11	1.07
2. Doing my job well gives...	300	6.28	.84
3. I feel bad when I do...	300	5.98	1.04
Idea Generation			
1. From time to time, I get...	284	3.03	1.39
2. I never get any good...	284	4.98	1.39
Willingness to Submit			
1. I would tell somebody...	289	5.57	1.13
2. I would not submit a ...	286	5.39	1.48
3. I would never submit...	280	5.56	1.26
4. If I had a worthwhile...	282	5.69	1.16

Table 3

Scale Reliabilities

Scale	Standardized Coefficient		Test-Retest (Lower-Bound)
	n	Alpha	n
Job Involvement	285	.63	
1. I am very much personally...			195 .34
2. I live, eat, and breathe...			189 .45
3. The most important things...			190 .45
Intrinsic Work Motivation	298	.69	
1. I get a feeling of personal...			197 .14
2. Doing my job well gives...			196 .34
3. I feel bad when I do...			196 .16
Idea Generation	278	.50	
1. From time to time I get...			136 .42
2. I never get any good...			136 .53
Willingness to Submit...	272	.75	
1. I would tell somebody...			142 .30
2. I would not submit...			136 .32
3. I would never submit...			132 .33
4. If I had a worthwhile...			137 .15

Sample

The participants (N=304) were full-time hourly workers who completed the 1983 survey. A demographic breakdown revealed that: 71% were male; (b) the mean age was 34.2 years; (c) at least 76.6% had graduated from high school or had a general education diploma; and (d) the mean organizational tenure was 9.3 years, as of October, 1983.

Measures

Job involvement scale. The items that comprise the job involvement scale are:

I am very much personally involved in my work.

I live, eat, and breathe my job. .

The most important things which happen to me
involve my job.

The job involvement scale used in this study was taken directly from the Michigan Organizational Assessment Package (Seashore, Lawler, Mirvis & Cammann, 1982). They reported a coefficient alpha of .62 for the three item scale.

However, the current study did not confirm that the three item job involvement scale presented by Seashore, Lawler, Mirvis and Cammann (1982) is a valid unitary scale. As can be seen in Table 1, the

inter-item correlations obtained in the present study for the job involvement scale are unacceptably low for a unitary scale. The items of the job involvement scale demonstrate low inter-correlations because they do not measure a unitary concept.

The item "I am very much personally involved in my work" taps a traditional conceptualization of job involvement. As noted above, job involvement has been conceptualized by Lodahl and Kejner (1965) in the abstract of their article as "the degree to which a person is identified psychologically with his work" (p. 24). They describe the job-involved person as one for whom work is a very important part of life, and as one who is affected very much personally by their whole job situation: the work itself, the company, his or her co-workers, etc. They also note that on the other hand, the non-job-involved worker does his or her living off the job. Work is not as important a part of his or her psychological life (p. 25).

The other two items of the job involvement scale do not directly assess a person's psychological identification with their work or the degree to which the job situation is central to the person and his identity, which is the definition of job involvement

used by Lawler and Hall (1970), Rabinowitz and Hall (1981) and the present study.

A person who agrees with the statement "I live, eat and breathe my job" is indicating that everything they do is related to their job. A family person with spouse and/or children that they love could be highly involved in their job and still indicate that they disagree with the statement "I live, eat and breathe my job." Just because a person's family (for example) is very important to them, it is not necessarily the case that their job is not also very important to them. High psychological involvement in one area of one's life does not necessarily preclude high psychological involvement in other areas. Similarly, a person who considers religion to be the most important aspect of their life could be highly involved in their job and disagree with the statement "The most important things which happen to me involve my job."

Because all three items of the job involvement scale do not directly measure job involvement (1) as defined for the purposes of this study, and (2) as a unitary concept (as demonstrated by the unacceptably low inter-item correlations), the scale was broken-up. The item "I am very much personally involved..." is the

only item of the scale which directly taps the concept of job involvement used in this study and was used as the measure of job involvement (Job Involvement 1). The other two items were used together (being that they demonstrate an acceptable inter-item correlation) as an additional scale (Job Involvement 2) and was included in the analyses for comparison purposes. It is to be noted however, that the Job Involvement 2 scale does not measure the definition of job involvement that has been accepted for use in this study.

Intrinsic work motivation scale. The items that comprise the intrinsic work motivation scale are:

I get a feeling of personal satisfaction
from doing my job well.

Doing my job well gives me a good feeling.

I feel bad when I do a poor job.

Idea generation scale. The items that comprise the idea generation scale are:

From time to time, I get good ideas about how my
work could be done better.

I never get any ideas that are really worth
submitting as suggestions.

Willingness to submit scale. The items that comprise the willingness to submit ideas scale are:

I would tell somebody if I had a good idea.

I would not submit a suggestion even if I had a
good idea.

I would never submit suggestions to this
organization.

If I had a worthwhile suggestion, I would submit
it.

Number of suggestions. The dependent variable suggestion contribution is the number of suggestions submitted by each employee that were approved as cost savings suggestions between November 1, 1983 and December 31, 1985. These data were obtained from detailed company records of suggestions submitted which specified: (1) the name of the suggestor, (2) a summary of the suggestion, (3) whether it was approved as a cost savings suggestion, and (4) processing history. This log was computerized, updated monthly, maintained by the researchers and site personnel, and was the basis of the innovation factor of the Gainsharing Formula. In total, 304 people submitted 393 suggestions during the 26 months data were collected for the dependent variable.

A log transformation of the suggestion data was performed and will also be included in the analyses

that include suggestion contribution as a variable. The log transformation of the variable suggestion contribution was included in an effort to reduce the adverse impact of extreme scores. The log transformation was performed by adding .5 to the total number of suggestions contributed for each employee (to avoid taking the log of zero) and calculating the base 10 log for this number.

Table 4

Pattern of Suggestion Activity

<u>No. Suggestion</u>	<u>Frequency</u>
0	138
1	74
2	44
3	22
4	7
5	7
6	4
7	3
9	2
10	1
12	1
17	1

Analysis

The test of the strength of the relationship between job involvement and idea generation was accomplished by a correlation of the scale values of the two variables.

Hypothesis 2 was tested by correlating the scale values of intrinsic work motivation and idea generation.

Hypothesis 3 was tested by correlating the scale values of idea generation and suggestion contribution.

Hypothesis 4 posits that the degree of the relationship between idea generation and suggestion contribution is a continuous function of the employees' willingness to submit their ideas. This hypothesis could be stated algebraically as

$$r_{xy} = f(z).$$

The test of this hypothesis would involve first calculating the correlation coefficient between idea generation and suggestion contribution for the scale values of the variable willingness to submit ideas (Arnold, 1982). These correlation coefficients are then correlated with their associated values of

willingness to submit ideas. The hypothesis is supported if this final correlation coefficient is significant.

Spearman Rho rank order correlations were used in the analysis of this hypothesis. Spearman type correlations were judged to be appropriate because of the small sample sizes involved and the possibility of extreme skewness of the subcategories.

Where there were scale values of the variable willingness to submit that occur infrequently, the scale values were pooled together to form subgroups with nine or more employees. Our guideline was to use ten or more employees per subgroup. During analysis a subgroup of nine employees was found and the decision was made to maintain that group as subgroup of nine. The value of willingness to submit for these groupings to be used in the analyses will be the mean of scale values of willingness to submit that were pooled together.

Hypothesis 5 posits that the form of the relationship between idea generation and suggestion contribution is conditional upon the employees' willingness to submit their ideas. This implies

conceptually, that the rate of change in idea generation associated with a given change in suggestion contribution is not a constant function of idea generation, but is conditional upon the employees' willingness to submit their ideas (Arnold, 1982).

The appropriate test of hypothesis 5 was accomplished through hierarchical multiple regression, testing the significance of the increment in variance accounted for by the product term (idea generation X willingness to submit) when entered into the equation after the terms for the linear effects of the variables idea generation and willingness to submit (Arnold, 1982).

CHAPTER III

RESULTS

The results for hypothesis 1 and 2 are presented in Table 5. Job involvement 1 was positively correlated with idea generation and was significant at the .01 level. Job involvement 2 was not significantly correlated with idea generation. Intrinsic work motivation positively correlated with idea generation and was significant at the .001 level. The results for hypothesis 3 are presented in Table 6. Idea generation was positively correlated with suggestion contribution and was significant at the .001 level. The values of the willingness to submit variable and the corresponding correlations between the variables idea generation and suggestion contribution (See Table 7), were found to be correlated .46 ($n=14$, $p<.048$). Figure 1 presents a graphic representation of the relationship between the subgroupings of willingness to submit and the corresponding correlations between idea generation and suggestion contribution. The results for the test of hypothesis 5 are presented in Table 8. The increment of variance associated with the interaction

term (idea generation X willingness to submit) over and above the linear effects was not significant.

As noted above, the analyses involving the variable suggestion contribution were also performed substituting a log transformation of the suggestion contribution data. The results of these analyses were virtually the same as those using the untransformed suggestion contribution data and are presented in Appendix A.

Table 5

Correlations of Survey ScalesScale

1. Job Involvement 1	-				
2. Job Involvement 2	.27 (297) .001	-			
3. Intrinsic Work Motivation	.32 (298) .000a	.16 (299) .002	-		
4. Idea Generation	.14 (283) .007	-.02 (284) .367	.22 (285) .000a	-	
5. Willingness to Submit	.24 (289) .000a	.02 (290) .391	.24 (291) .000a	.24 (289) .000a	-
	1	2	3	4	5
	Scale				

(Correlation Coefficient/Cases/1-Tailed Significance)
a Indicates that the probability is less than or equal to .0005

Table 6

Relationships Between Survey Scales and Suggestion Behavior

<u>Scale</u>	<u>Suggestions</u>		
	<u>N</u>	<u>r</u>	<u>p</u>
Job Involvement 1	298	.11	.030
Job Involvement 2	299	-.01	.408
Intrinsic Work Motivation	300	.10	.038
Idea Generation	289	.19	.001
<u>Willingness to Submit</u>	295	.14	.010

Table 7

Correlation of Idea Generation and Suggestion Contribution
For Values of Willingness to Submit

n	Mean Value WTS	Correlation IG - SC
12	7.00	.31
12	6.74	.23
17	6.50	.35
24	6.25	-.23
84	6.00	.28
26	5.75	.20
17	5.50	.17
13	5.25	.46
22	5.00	-.23
14	4.74	.18
13	4.50	.26
9	4.25	.11
14	4.00	.04
10	2.71	-.08

WTS=Willingness to Submit

IG=Idea Generation

SC=Suggestion Contribution

LGSC=Log of Suggestion Contribution

Table 8

Multiple Regression Summary Table

Suggestion Contribution as Dependent Variable

Variable	Corr	MultR	² R	F(eqn)	p F	² R ch	F ch	p Ch
IG	.192	-	.037	10.964	.001	-	-	-
WTS	.131	.211	.044	6.638	.002	.008	2.263	.134
IG*WTS	.215	.226	.051	5.093	.002	.007	1.960	.163

IG=Idea Generation

WTS=Willingness to Submit

IG*WTS=Interaction term of Idea Generation X Willingness to Submit

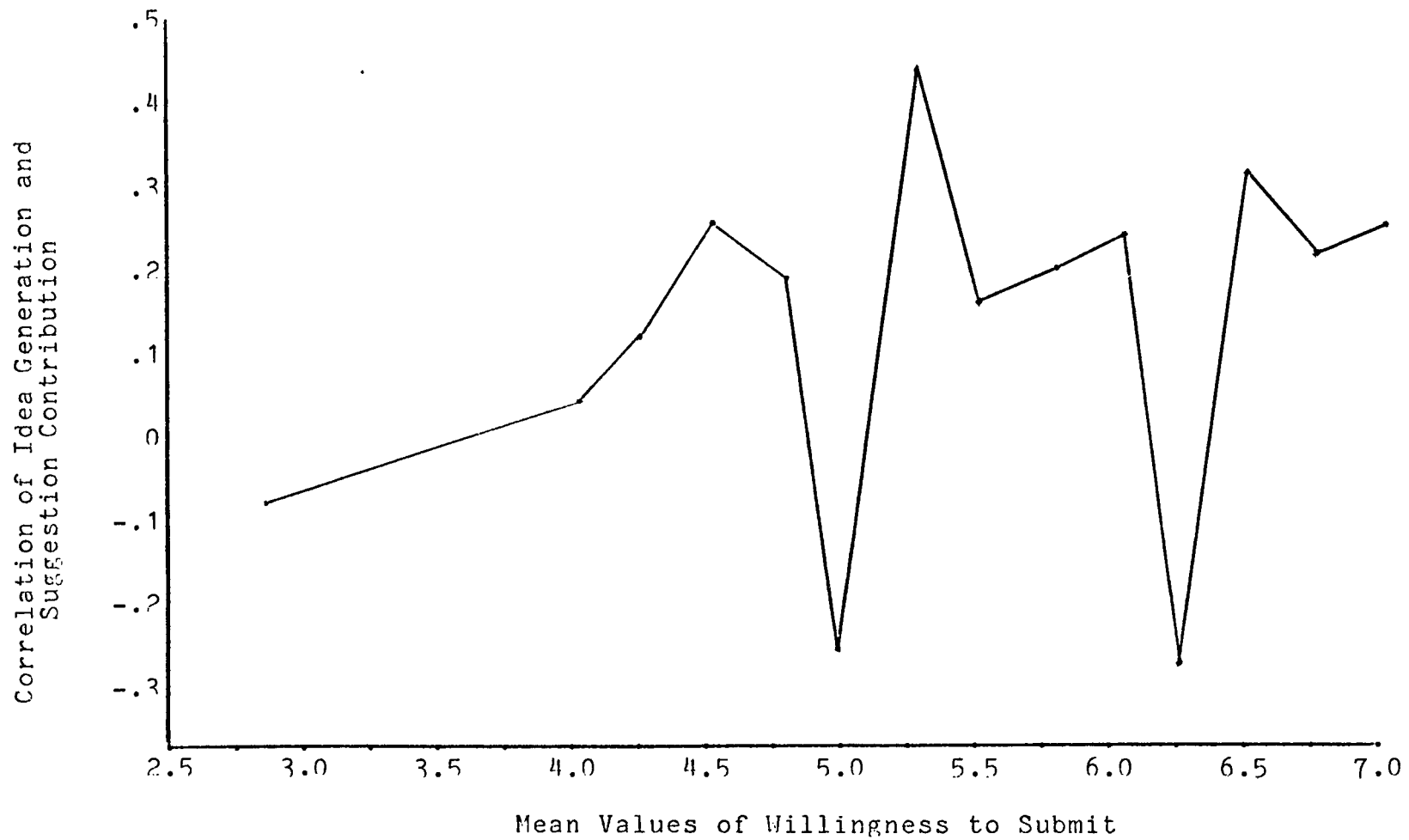


Figure 1. Moderation of the Degree of Relationship Between Idea Generation and Suggestion Contribution

CHAPTER IV

DISCUSSION

This study supported the hypothesis that job involvement (as defined for this study) correlates positively with idea generation. Job involvement was also found to be related to suggestion contribution. These findings point out a central aspect of the creative process. That is, the creative process demands the involvement of the creator. The results of this study support the contention that the most innovative individuals in a work environment are not those who are alienated from their work, who do not think about their work even when they are doing it--but those who are involved. These results are not in opposition to the hypothesis that employees who are more involved in their job submit more suggestions possibly because they spend more time thinking about their work. Other mechanisms may also be possible and more research is needed to further explore the exact nature of the relationship between job involvement and suggestion behavior.

Job involvement measured by the two items "I live,

eat, and breathe my job," and "The most important things which happen to me involve my job" was not found to be significantly related to idea generation. As noted earlier, these two items do not measure the definition of job involvement used by Lawler and Hall (1970), Rabinowitz and Hall (1981) and the present study. As such, the results of this analysis are not directly relevant to the purposes of this study.

The hypothesis that intrinsic work motivation is positively related to idea generation was supported. Intrinsic work motivation was also found to be positively related to suggestion contribution. These results suggest that workers who experience internally mediated rewards (e.g., increased self-esteem) when they perceive themselves as doing their job well, tend to generate more ideas and submit more suggestions than those who do not experience internally mediated rewards in similar circumstances.

Because job involvement are not orthogonal variables, regression analyses were performed to investigate their unique contributions in accounting for variance in idea generation. This was accomplished by entering either idea generation or willingness to submit first into a regression equation and then

evaluating the increase in variance explained by addition of the second variable into the equation. Table 9 contains a summary of the results of these analyses. Intrinsic work motivation was found to add significantly to the variance explained in idea generation over and above that explained by job involvement (as defined for the purposes of this study). Job involvement was not found to contribute significantly to the variance explained in idea generation over and above that accounted for by intrinsic work motivation. The results of these analyses point out the great deal of common variance (in accounting for variability in idea generation) that is shared by job involvement and intrinsic work motivation. Future research will hopefully continue to explore and elaborate upon the entire complex of variables associated with variability in idea generation, in the hope that this will lead to a greater understanding of the role that each variable plays in explaining the generation of ideas.

Table 9

Regression Analyses of the Unique Contributions of
Intrinsic Work Motivation and Job Involvement

Unique Contribution of Intrinsic Work Motivation

Variable Entered	Corr	MultR	² R	F(eqn)	p F	² R ch	F ch	p Ch
JI	.145	-	.021	5.996	.015	-	-	-
IWM	.222	.237	.056	8.337	.000a	.035	10.476	.001

Unique Contribution of Intrinsic Work Motivation

Variable Entered	Corr	MultR	² R	F(eqn)	p F	² R ch	F ch	p Ch
IWM	.222	-	.049	14.529	.000a	-	-	-
JI	.145	.237	.056	8.337	.000a	.007	2.088	.150

JI=Job Involvement

IWM=Intrinsic Work Motivation

a indicates that the probability is equal to or less than .0005

The hypothesis that idea generation and suggestion contribution are positively related was supported. This finding supports the construct validity (James, 1973) of both the idea generation and suggestion contribution measures. Certainly, the failure to find support for hypothesis 3 would initiate serious doubt regarding the adequacy of one or both of these measures.

The hypothesis that willingness to submit ideas moderates the degree of relationship between idea generation and suggestion contribution was supported. The relationship between idea generation and suggestion contribution tended to be stronger for employees who were willing to submit their ideas than for those who were not willing. The results for the test of hypothesis 4 could also be interpreted as supporting the proposition that variation in idea generation accounts for, or explains more of the variance in suggestion contribution for employees who say they are willing to submit their ideas than for those who are not willing. It could be the case that people who are between the extremes of strongly willing or unwilling may be willing to submit certain ideas and not others. That is, people may vary in the extent to which they

tend to keep their ideas to themselves, some people being more likely to disclose their original ideas than others. This would account for the greater proportion of variance in suggestion contribution that is explained by variation in idea generation among those who say they are willing to submit.

The issue at hand in the analysis of hypothesis 4 is analogous to that of differential validity from the selection literature. As Arnold (1982) noted, "The issue of differential validity is precisely the issue of whether or not the degree of relationship between a predictor and criterion is significantly different for different subgroups of the population" (p. 148). In a similar manner, the analysis of hypothesis 4 sought to determine if the relationship between two variables (idea generation and suggestion contribution) is different for different subgroups (of willingness to submit). As noted above, if willingness to submit suggestions does moderate the degree of relationship between idea generation and suggestion contribution then this is an important factor for future research investigators to take into consideration when trying to establish a nomological network among variables associated with worker innovation. Failure to take a

true moderator effect into account could lead to a failure to find relationships where they actually exist.

The results of the test of hypothesis 4 support the position that workers who have ideas will be more likely to submit them if they say they are willing, than those who have an equal number of ideas but indicate that they are not willing to contribute the ideas that they have. In the light of these findings, a manager who seeks to promote suggestion contribution among their fellow employees should consider not only those factors that are associated with high rates of idea generation, but also the willingness of the employees to submit the ideas that they have.

The hypothesis that willingness to submit ideas moderates the form of the relationship between idea generation and suggestion contribution was not supported (See Table 8). The results suggest that the variation in suggestion contribution is not a joint function (interaction) of the independent variables idea generation and willingness to submit.

One unique aspect of this study is its use of hourly workers as research participants. As noted earlier, most other studies of creativity in the

workplace that have appeared in the literature have used professional innovators (e.g., research scientists and engineers) as the research participants. The results of this study suggest that innovation is not something that can only be done by someone with special abilities or predispositions (e.g., professional innovators). This study found that many blue-collar hourly workers are capable of generating innovative ideas. In fact, 55% of this study's participants had submitted at least one cost saving suggestion during the 26 months data were collected for the dependent variable. This study was also unique in that it used an objective measure of creative performance (number of cost saving suggestions submitted) rather than supervisor ratings of creative performance that are used by nearly all studies of creativity in the workplace that have appeared in the literature.

Although the results of this study do not provide information that would allow conclusions to be drawn regarding the direction or sequence of causality among variables, it does provide important information regarding employee innovation and factors related to its occurrence. The results of this study suggest that a company that wishes to promote innovation among its

hourly employees should be aware of the levels of job involvement and intrinsic work motivation experienced by workers, since high levels of these variables are associated with high levels of employee innovation.

Providing information regarding the relationships between employee innovation and factors related to its occurrence also furthers the development of a nomological network (Feigl & Scriven, 1956; Margeau, 1950) regarding worker innovation. As noted earlier, many companies are interested in promoting productivity and profitability through employee involvement programs such as the gainsharing program employed at the site of this study. These companies are looking to scientists for guidance in the development of these and other types of employee involvement programs. In order for scientists to provide guidance in this area they must develop and utilize a theoretical network that specifies relationships among concepts. This network specifies what concepts should be related to other concepts, which concepts should not be related and specifies the nature of these relationships which should be observed. This study has endeavored to further the development of a nomological network regarding worker innovation by exploring the

relationships between worker innovation and other key variables.

It would be desirable for future studies to use longer samples of suggestion contribution where possible. Because suggestion contribution is a rather infrequent event (like accidents or union grievances) it takes an extensive period of time to accumulate enough data to produce a distribution that will be adequate for analysis purposes. Although in this particular study it was possible to accumulate sufficient suggestion data in just 26 months, future studies are advised to allow even more time for the collection of suggestion data because the rate of suggestion contribution can and does vary from site to site.

Direct generalization of the findings of this study should be limited to settings where gainsharing type employee involvement programs have been implemented. This is advised because gainsharing programs typically encourage and reward employee suggestions in a way that sets them apart from other employee involvement programs. Generalizations should also be limited to settings where the gainsharing type programs have become an established feature of the

organization. The implementation of gainsharing type programs can have a profound effect on many of the variables that may be included in an organizational assessment. Assessments performed before the gainsharing type program became an established feature of the organization are likely to find different results than investigations of settings where employees have had time to become familiar with the program and its true benefits and liabilities.

One limitation of this study is the use of a one-item job involvement scale. A valid, unitary, multiple item scale that measures job involvement as defined by Lawler and Hall (1970), Rabinowitz and Hall (1981) and the present study is certainly required if progress is to be made regarding an understanding of the relationships between job involvement and other variables. This study used a one-item job involvement scale because it was found to be the only valid measure of job involvement as defined. Future studies would benefit from the use of a unitary, multiple item job involvement scale that would allow the use of coefficient alpha as the estimate of reliability.

Summary

Future investigations of creativity should keep in

mind the role of involvement in the creative process. The results of this study support the view that it is not through alienation that people create, but through involvement. Although it can seem obvious that involvement is an important aspect of the creative process, past studies of creativity have neglected the involvement of the creator in their investigations of the creative process. Future investigations of creativity should also consider the willingness of people to submit ideas as an important aspect of the creative process. Failure to consider the potential impact of this variable could lead to a failure to find relationships between other variables where they actually exist (type II error).

Although few investigations regarding employee suggestion behavior have been performed to date, the area appears to be highly amenable to research and ripe for model development. Employee suggestion behavior can be considered to be important from a number of perspectives. First, employee suggestions can have a profound impact upon organizations, in terms of adaptive capabilities and overall profitability. They can also allow workers to make changes in the way their work is performed, which increases their influence over

the events of their own lives. Suggestion behavior can also be considered to be important from the perspective of psychology as a whole. Suggestion data offers the advantage of an objective type of data that is maintained by many organizations, that is amenable to both applied research and the investigation of basic psychological issues such as the relation between attitudes and behavior. In the light of the potential benefits for employers, employees and psychology as a whole, it seems likely that interest regarding the phenomenon of employee creativity will continue to accelerate.

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APPENDIX A

Results Using Log Transformation of
Suggestion Contribution as Dependent Variable

Log transformations of data can be helpful in analyses involving extreme scores, as in the case of much of suggestion contribution research. Log transformations are frequently included in research investigations involving suggestion contribution because they can help to minimize the adverse impact that extreme scores can have in statistical analyses. This appendix has been included to provide interested researchers with information regarding the impact of a log transformation in the analyses of this study.

Table 1 contains the log values calculated from the raw suggestion contribution data. Table 2 contains the results for the analysis of hypothesis 3 using the log transformation of suggestions contributed. Idea generation was positively correlated with the log of suggestion contribution and was significant at the .001 level. Table 3 contains the results of hypothesis 5 using the log transformation of suggestions contributed as the dependent variable. The increment in variance associated with the interaction term (idea generation X the log transformation of suggestion contribution) over and above the linear effects was not significant.

Table 1

Pattern of Suggestion Activity

<u>No. Suggestion</u>	<u>Log Suggestion</u>	<u>Frequency</u>
0	-.30	138
1	.18	74
2	.40	44
3	.54	22
4	.65	7
5	.74	7
6	.81	4
7	.88	3
9	.98	2
10	1.02	1
12	1.10	1
17	1.24	1

Table 3

Relationships Between Survey Scales and Suggestion Behavior

<u>Scale</u>	<u>Log Suggestions</u>		
	<u>N</u>	<u>r</u>	<u>p</u>
Job Involvement 1	298	.10	.040
Job Involvement 2	299	-.05	.204
Intrinsic Work Motivation	300	.14	.008
Idea Generation	289	.18	.001
<u>Willingness to Submit</u>	295	.12	.019

Table 3

Multiple Regression Summary Table

Log of Suggestion Contribution as Dependent Variable

Variable	Corr	MultR	R^2	F(eqn)	p F	R^2 ch	F ch	p Ch
IG	.184	-	.030	10.034	.002	-	-	-
WTS	.109	.184	.034	5.687	.004	.005	1.329	.250
IG*WTS	.196	.210	.044	4.371	.005	.006	1.710	.192

IG=Idea Generation

WTS=Willingness to Submit

IG*WTS=Interaction term of Idea Generation X Willingness to Submit