

**EFFECTS OF CURIOSITY ON SOCIALIZATION-RELATED LEARNING
AND JOB PERFORMANCE IN ADULTS**

by

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(ABSTRACT)

Although the significance of curiosity in motivating and directing learning has received substantial scholarly support, little information exists about curiosity's importance in adult learning. The purpose of this study was to investigate curiosity's possible relevance in an adult learning context, the workplace. Specifically, this study was an examination of adult curiosity's relationship to socialization-related learning, and ultimately job performance.

Four curiosity instruments (the Novelty Experiencing Scale; State-Trait Personality Inventory; Melbourne Curiosity Inventory; and the Sensation Seeking Scale), one socialization-related learning questionnaire (Workplace Adaptation Questionnaire), and one job performance instrument (developed to assess technical and interpersonal job performance) were administered in four service-industry organizations. Demographic data were also collected and the final sample included 233 employees.

Two-, three-, and four-factor curiosity models were examined to clarify the nature of the curiosity construct. Curiosity factor scores were subsequently used as independent variables in multiple regression equations to assess their research utility. Three a priori determined, recursive path models suggesting a causal influence of curiosity on socialization-related learning and job performance were tested as well. Standardized partial regression coefficients were calculated from a combination of the correlational matrix containing the three main study variables (curiosity, socialization-related learning, and job performance), and their standard deviations, using the EQS for Windows 5.4 routine.

Multiple loadings of several of the curiosity subscales on the curiosity factors indicate a conceptual overlap between the Sensation Seeking and Venturesomeness curiosity factors; thus, the nature of curiosity may be best represented by a Cognitive Curiosity and Sensation Seeking factor interpretation. The findings also suggest that the two-factor curiosity model may have

had the best research utility for the purposes of this study. The three- and four-factor curiosity solutions did not explain a significant amount of additional variance in the multiple regression models predicting socialization-related learning and job performance.

Results suggest, too, that curiosity has both a direct and an indirect causal influence on job performance. This research indicates that curiosity or the desire for information has a weak but significant direct effect on total job performance, and its effect on total job performance can also be mediated by the learning associated with the socialization process. When examining curiosity's effect on the two separate job performance dimensions, i.e., technical and interpersonal, curiosity's only significant effect on both job performance dimensions was mediated through the socialization-related learning variable.

Overall, this study's findings suggest support for adult curiosity as being relevant in the socialization process and in job performance as well.

To my children,
Stephanie, Brooke, and Dillon,
with all my love

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CHAPTER I INTRODUCTION

Curiosity is one of the permanent and certain characteristics of a vigorous intellect.-Every advance into knowledge opens new prospects and produces new incitements to further progress.

Samuel Johnson (Edwards, 1965)

Curiosity and wonder is the mother of all science (Dewey, 1910), and humankind's natural curiosity has been a major impetus behind scientific discovery and the advancement of civilization (Gorlitz, 1987). Piaget (1952) considered curiosity a requirement for the expansion of knowledge. Bruner (1966) theorized that curiosity is so important that it "is essential to the survival not only of the individual but of the species" (1966, p. 115). Maslow (1970) posited curiosity to be an important element in the development of a psychologically healthy person. Voss and Keller (1983) stressed that curiosity and the exploratory behavior it elicits is vitally important to human development because it assists in the flexible adaptation to changing environmental conditions and implies "a direction of development toward differentiated interaction patterns and more effective problem solving" (p. 156). Giambra, Camp, and Grodsky (1992) claimed that the experiences gained through curiosity and exploratory behavior allow normal patterns of adult cognitive development. Thus, curiosity, or the desire to seek information and knowledge, has been often thought of as one of the important motivators of human behaviors throughout the lifespan (Loewenstein, 1994).

Maslow (1970) claimed, too, that satisfying one's curiosity is one of the important positive determinants for acquiring knowledge. Indeed, Berlyne (1963, 1978) and others (e.g., Freemantle, 1995; Gorlitz, 1987) declared that curiosity and the acquisition of knowledge has helped to fuel the 20th century's dizzying array of scientific and technological advances. Therefore, a better understanding of curiosity may help us remain on the forefront of advancement and competitiveness in our ever-changing world.

In the past, curiosity has frequently carried a rather negative connotation, especially in everyday language (Berlyne, 1978; Day, 1982; Gross, 1975; Vidler, 1977; Voss & Keller, 1983). Quite often it has been viewed as a vice, a demonstration of a lack of self-restraint, akin to meddlesomeness and even nosiness. The old adage, "The over curious are not over wise" seems to mirror this position well.

Notwithstanding, curiosity has been increasingly perceived as a virtue and as one of the desirable traits of education, particularly since the 1950s (Berlyne, 1978; Olson, 1986; Vidler, 1977). In educational contexts, it is considered an essential contributor to learning, and is regarded as "that factor which underlies the willingness of an individual to expose himself to information" (Day, Langevin, Maynes, & Spring, 1972, p. 330). Possessing and demonstrating an openness to new information and the acquisition of new knowledge could arguably be one of society's more pressing needs. By building upon the accumulated knowledge and wisdom of our predecessors, we can use this newly attained knowledge to creatively confront the problems of our day.

Background of the Problem

Research Focus

Experiments conducted with primates in the 1950s demonstrated the existence of a curiosity drive in animals and stimulated a renewed interest in human curiosity research in the 1960s and 1970s (Ainley, 1987). Much of the resulting investigation into curiosity has focused on children, adolescents, and college students, while inquiry into adult curiosity has been remarkably scant (Ainley, 1987; Camp, Rodrigue, & Olson, 1984; Maw & Magoon, 1971; Rossing & Long, 1981). It may be that curiosity among adults has been overlooked due to the common perception that children are by nature more curious (Tucker, 1986). Tucker also claimed that the lack of research into curiosity among adults may also be rooted in societal attitudes glorifying youthfulness, ignoring the middle years, and abhorring old age. As a consequence, most studies have focused on a decidedly limited population, resulting in a lack of information on the possibly important roles of curiosity in diverse adult contexts.

In a private telephone conversation on December 8, 1993, Dr. Boyd Rossing of the University of Wisconsin decried the notion that curiosity is of significance to only youth. He advocated viewing curiosity as a vital component of the learning process and stressed the importance of gaining a more balanced perspective with regards to its relevance, especially as it relates to adult learning. To do so, he suggested researching curiosity in an essential adult setting: the workplace.

Definitional and Conceptual Problems

The examination of curiosity has been exacerbated by problems with its definition (Boyle, 1979; 1989; Fowler, 1965; Krietler & Krietler, 1994; Rossing & Long, 1981; Vidler, 1977). Some researchers refer to curiosity as "sensation seeking" (Scroth & Lund, 1994; Zuckerman, 1979); others prefer to think of it as "exploratory behavior" (Voss & Keller, 1983), or "interest" (Fink, 1994). Overall, researchers dispute whether curiosity is more meaningful as a "motivational state" or a "personality trait" (Boyle, 1979, 1983, 1989; Camp, 1986; Camp et al., 1984; Langevin,

1971, 1976; Naylor, 1981). According to Rossing and Long (1981), the subsequent lack of definitional and conceptual clarity has been in part responsible for the ambivalence adult educators have toward the importance of curiosity in adult learning. Thus, it would seem plausible there is a need for additional research to help clarify the nature of curiosity and its possible effect on learning, particularly in adult contexts like the workplace.

Curiosity and the Learning Process

Curiosity is often declared to be an important component of the learning process (Berlyne, 1960, 1962; 1965; Bruner, 1966; Day, 1968b; Driscoll, 1994; Necka, 1989; Olson, 1986; Rossing, 1993), as it is viewed as a vital part of normal cognitive development and a requisite for the growth of knowledge (Camp, 1986).

Several researchers have attempted to relate curiosity to various measures of academic achievement or learning performance. Maw and Maw (1961) discovered that children with a high level of curiosity remembered what they learned longer than less curious children and learned more from a given exposure of information. Hogan and Greenberger (1969) observed a persistent, moderate correlation between academic achievement and curiosity in school children (as rated by their teachers). Likewise, Vidler (1974), with an undergraduate college population, found a modest positive relationship between his measure of academic curiosity (Vidler & Rawan, 1974) and academic learning performance (final course grade). Thus, some evidence supports the relationship between curiosity and academic achievement or learning performance. However, the empirical relationship between curiosity and achievement or performance in adult learning situations has not been explored.

Socialization-Related Learning

Socialization-related learning could be one promising area of curiosity research. Ostroff and Kozlowski (1992) inform us that during their first 9 months on a job, employees focus on acquiring information to learn the technical and interpersonal skills necessary to adequately perform in their new positions. The information needed to develop these technical skills comes from such diverse sources as official organizational literature, observation, and experimenting with new behaviors. Interpersonal skill information, alternatively, is derived mostly from mentors, supervisors, and co-workers. This information acquisition and learning process should be similar for those who, for example, have a new manager, a new coworker, a new job task, a new work group, new job-related equipment, or need knowledge to keep abreast of new developments in their fields, etc. (Morton, 1993; Schein, 1988). Thus, there seems to be many situations where learning is vital in workplace settings.

Statement of the Problem

Szilagyi and Wallace (1990) claimed that "learning leads to an increase in [job] performance" (p. 72). Gagne (1965), similarly, informed us that changes in performance provide evidence of learning. Thus, one measure of learning among adults might be changes in job performance. It is safe to assume it would be highly improbable that one could perform one's job effectively for any period of time without the involvement of some prior formal training, on-the-job training, socialization-related learning, informal learning, or incidental learning (Morton, 1993). Inasmuch as curiosity is important to the learning process (Camp, 1986, Day et al., 1972; Giambra et al, 1992; Rossing, 1993) and levels of job performance are actually a demonstration of some degree of successful workplace or socialization-related learning (Miller & Jablin, 1991; Ostroff & Koslowski, 1992; Schein, 1988), the possibility that learning mediates the relationship between curiosity and job performance needs to be investigated as no prior research exists at this time.

Curiosity is often considered to be the desire to gain information, which, in turn, results in exploratory behavior and knowledge acquisition (Berlyne, 1960, 1963). A better understanding of the contribution of curiosity to learning and job performance might assist human resource practitioners in designing organizational interventions, thus facilitating the requisite learning necessary for successful employee workplace adaptation or socialization. Further, better definitional and conceptual clarity could assist adult learning theorists in visualizing the possible need to account for curiosity in learning theory. Therefore, to achieve a better understanding of the perhaps masked effects of curiosity on learning and ultimately on job performance, additional empirical investigation is needed.

Curiosity is often treated in the literature as a unitary construct, yet existing instruments are only correlated moderately, suggesting curiosity is multifaceted (Olson & Camp, 1984). Through factor-analytic research, Langevin (1971) and Ainley (1987) proposed two factors to describe the construct of curiosity, i.e., "depth of interest" and "breadth of interest."

Morton (1993), through a factor analysis with varimax rotation identified three socialization-related learning subfactors, i.e., Establishing Relationships, Acculturation, and Job Knowledge. Thus, socialization-related learning is multidimensional as well. She claimed that socialization-related learning starts with establishing coworker relationships. The next step involves becoming acculturated to the company through interaction with primarily their supervisors. Finally, the culmination of the learning associated with the first two steps results in acquiring the appropriate knowledge to perform the job.

According to Motowidlo and Van Scotter (1994) job performance is composed of two dimensions, i.e., contextual performance (interpersonal job knowledge), which refers to one's level of interpersonal skills, and task performance (technical job knowledge), which refers to one's level of technical skills. To successfully perform one's job, therefore, one may need to possess some degree of skill in handling both of these job requirements.

However, while the aforementioned research indicates that curiosity, socialization-related learning, and job performance are all multidimensional, their interrelationships remain unclear.

Purpose of the Study

Curiosity is considered to be an information-seeking process that directs and motivates learning (Berlyne, 1954, 1960, 1963). Since Deming (cited in Senge, 1993, p. 6) averred that people's "curiosity to learn" is destroyed as they mature, especially in the workplace, a more thorough understanding of curiosity's role in socialization-related learning and job performance might help human resource practitioners design better organizational interventions. Such an understanding might assist these practitioners as they facilitate employee workplace adaptation or socialization and nurture an organizational climate in which learning is fostered. A clearer understanding of curiosity may also help learning theorists appreciate the need to account for curiosity in learning theory. Consequently, the purpose of this exploratory research was to systematically investigate the possible causal influences of adult curiosity and socialization-related learning on job performance.

Research Questions

The research questions were as follows:

1. What is the relationship of selected measures of curiosity to socialization-related learning?
2. What is the relationship of selected measures of curiosity to different facets of job performance?
3. What is the extent of the possible mediating effect of socialization-related learning among the *a priori* determined variables: curiosity and job performance? (i.e., To what extent does socialization-related learning mediate the relationship between curiosity and job performance?)

Assumptions

1. All of the research instruments in this study had appropriate content and construct validity and were not simply measuring intelligence or general ability.
2. The participants of this study fully understood the instructions on each research instrument and followed them

carefully, and consequently answered all questions honestly and appropriately.

Limitations of the Study

All the variables of interest in this study were assessed by introspective self-report questionnaires. Thus, supervisor or peer observations concerning the variables in question were not part of this research.

Although the research population was quite diverse, making for an interesting study, the results of this study should be generalized only to a similar population of adults. It is hoped, however, that the results of this study will stimulate further investigation of curiosity and its possible roles in other kinds of learning.

Delimitations of the Study

Because this research's main purpose was to investigate whether adult curiosity has a possible influence in socialization-related learning and job performance in general, strategies to promote curiosity and socialization-related learning as they related to job performance were not explored.

Definition of Terms

Causal. According to Loehlin (1992), "the use of a causal arrow in a path diagram is the assumption that a change in the variable at the tail of the arrow will result in a change in the variable at the head of the arrow, all else being equal" (p. 4).

Curiosity. A state of increased arousal response, promoted by a stimulus high in uncertainty and lacking in information, resulting in exploratory behavior and the search for information (Berlyne, 1960; Day et al., 1972). External stimuli such as novelty, uncertainty, conflict, and complexity (i.e., "collative stimuli") create an internal state of arousal. Exploratory action reduces that arousal (Berlyne, 1960).

Diversive curiosity. A general condition that may be considered the need to seek new experiences or extend one's knowledge into the unknown. It may elicit what Day (1971) called diversive exploration.

Epistemic curiosity. "...the desire to gain knowledge" (Rossing & Long, 1981, p. 25). Berlyne (1962) defined it as a state of high arousal that impels the quest for knowledge and is relieved by the acquisition of knowledge.

Socialization-related learning. The mostly informal learning associated with the organizational socialization process where

information about an organization's culture, norms, and procedures are transmitted (Copeland & Wiswell, 1994).

Specific curiosity. The aroused state of an organism when confronted by an ambiguous stimulus that may result in specific exploration (Day, 1968b).

State curiosity. Individual differences in response to a particular curiosity-arousing situation (Naylor, 1981). It is an index of the arousal of curiosity.

Trait curiosity. Individual differences in the ability to experience curiosity (Naylor, 1981). It reflects the propensity to respond to alternative situations with curiosity.

Significance of the Study

In important learning environments like the workplace, continuous learning and thus curiosity helps people make sense of and use increasing amounts of new, novel, and discrepant information (Rossing, 1993). Garvin (1989) averred that new knowledge acquired through this process of organizational or workplace learning improves performance. In fact, since few of today's organizational positions could be adequately performed with simply the job skills learned 20 years ago (Sonnenberg & Goldberg, 1992), the very nature of the workplace requires curiosity and continuous learning.

Accordingly, developmental interventions that foster curiosity by creating the conditions that support it or by stimulating an atmosphere of curiosity in educational settings would help learners and organizations more adequately cope with the shifting demands of our rapidly changing world.

With a better understanding of curiosity's relationship to socialization-related learning and job performance, human resource development practitioners should be better able to design such interventions. As a consequence, there would be fewer problems with poor job performance, negative work attitudes, stress, and, ultimately, job turnover.

Finally, with the increased definitional and conceptual clarity that was derived from this exploratory research, adult educators should more readily recognize the potential importance of curiosity in adult learning and the possible need to account for it in new learning theory.

CHAPTER II REVIEW OF THE LITERATURE

An investigation of the educational and psychological literature revealed an increasing recognition of the importance of curiosity among humans, yet there has been very limited empirical research emphasis on curiosity or its relationship to socialization-related learning and, ultimately, job performance.

Curiosity: A Vice?

Until the early 1950s, children who had a propensity to ask excessive questions or who pried into business not pertaining to them were disparagingly labeled as "curious" or "inquisitive" (Berlyne, 1978). "My what a curious child" was meant to be anything but a compliment; rather, it smacked of contempt. Consequently, curiosity was more often considered a vice than an attribute worthy of encouragement.

Upon examining The New Dictionary of Thoughts (Edwards, 1965), almost half of the curiosity quotations attributed to ancient and modern authors were negative. In a similar vein, Gross (1975) claimed that curiosity can become distorted when it leads to the excessive gobbling of trivial details without meaning, becomes a search for sensation through collecting drug experiences, or when it turns into scientific experiments that harm life. Indeed, Vidler (1977) suggested there was, until the 1950s, pressure to avoid developing an overly inquiring citizenry at the national level due to curiosity's widespread negative perception. In 1978, even the most widely known curiosity theorist, D. E. Berlyne, noted that the notion of curiosity could go too far, "To doubt and wonder about everything, to spend a great deal of time investigating problems of minor importance or with little prospect of rapid solution can be paralyzing and wasteful" (p. 99).

Curiosity as a Virtue

Despite curiosity's age-old negative perception, the vast majority of past and present writers of curiosity have acknowledged it favorably and deemed it worthy of encouragement (Vidler, 1977). In educational thought, in fact, it has enjoyed an increasingly high status. Berlyne (1978) viewed curiosity as a virtue and an important component of any sound child's educational program. Children's natural, innate curiosity should be nurtured, Berlyne believed, by encouraging them to raise questions and seek answers and to wonder about the things around them, i.e., to have inquiring minds. Moreover, he contended that the skill of judging when it would be fruitful to engage in curiosity-invoking activities should be conveyed to children. Chen (1994) and Chen and Benesch (1996) seem to mirror Berlyne's position well by

claiming there are great benefits to incorporating curiosity into the design of children's classroom activities.

Berlyne (1978) attributed the ascendancy of this perspective to social and political events in the 20th century where the prudence and acumen of those in power have been increasingly mistrusted, while at the same time social and technological changes and the new problems they engender are creating a need for new knowledge and ideas. By being curious and inquiring, therefore, the prevailing wisdom could be challenged and important new information, ideas, and knowledge could be generated to assist humankind adapt to the demands of a rapidly changing world.

Curiosity Research

Most of the research on curiosity has involved animals (e.g., Harlow, Blasek, & McClearn, 1956; Harlow, Harlow, and Meyer, 1950), children (e.g., Chen, 1994; Chen & Benesch, 1996; Keller, 1994; Maw & Magoon, 1971; Maw & Maw, 1962, 1968; Penny & McCann, 1964; Rigol, 1994; Trudewind & Schneider, 1994), and college students (e.g., Kerr & Beer, 1992; Rodrigue, Olson, & Markley, 1987; Vidler & Rawan, 1974, 1975).

Curiosity Research With Animals

Much research has demonstrated that monkeys, raccoons, rats, birds, dogs, and others seek new stimuli, explore their environment or behave so as to maximize knowledge (Berlyne, 1965; Buckholtz & Persch, 1994). For example, Harlow, Harlow, and Meyer (1950), in their experiment with rhesus monkeys, demonstrated that complex manual operations were intrinsically rewarding when no extrinsic reward was offered. The experimental group had 10 days of experience disassembling a puzzle that had been left in their cages. The researchers periodically reassembled the puzzles. Conversely, the unassembled pieces were simply left in the cages of the control group during the same period. Subsequent to the 10-day test period, both groups were tested, first with a reward for disassembling the puzzle and then with none. In both cases, the control animals were much less adept at solving the puzzle than the experimental group, even without extrinsic reward. Furthermore, the experimental group performed better without reward than with reward, leading Berlyne (1960) to conclude that the results offer support for a strong curiosity drive.

Berlyne (1960) argued this manipulatory behavior and its accompanying stimuli may acquire intrinsic or extrinsic reward value only through relation with primary rewards, such as feeding, as it is likely primates in general have accomplished innumerable manipulatory tasks while trying to satisfy their physiological needs. To repudiate this notion, however, Berlyne cited a study by Harlow, Blasek, and McClearn (1956) in which monkeys were found to manipulate a fastening device as a form of self-reward, actually improving with practice in the absence of extrinsic

reinforcement (even for previously hand-fed infant monkeys). Berlyne believed that the primates' increased proficiency in manipulating the fastening device without extrinsic reward also demonstrated a strong curiosity drive.

In a study with 32 albino rats, Montgomery (1953) found support for his hypotheses that exploration is greatly dependent on external stimuli, that the strength of the exploratory drive motivating exploratory behavior decreases with time of exposure and, most importantly, that there is indeed an exploratory drive.

Myers and Miller (1954) used 50 rats to determine that animals would learn to perform a response, even without extrinsic reward. They concluded reward was not a condition for learning.

Williams and Kuchta (1957) and others (e.g., Dember, 1956) discovered that rats seek out environmental variability. Rats in their studies would generally explore the more novel of two arms of a maze.

Fowler (1965) wrote an excellent summary of much of the current animal research of the time, which reflected a general agreement that the behavior observed in their maze-running experiments could be labeled as curiosity. According to Berlyne (1960) and Ainley (1987), this research on animals, which demonstrated the existence of a curiosity drive and therefore offered a plausible explanation for the motivation of certain exploratory behaviors, led to a renewed interest in the investigation of human curiosity.

Curiosity Research with Children

Berlyne (1978) cited several studies whose authors considered curiosity to be a characteristic trait of childhood, however childhood curiosity was not deemed to be important enough for scholarly examination until the 1950s. Since this time, nonetheless, there have been varying efforts to explore childhood curiosity.

Maw and Maw (1961) claimed that children judged highly curious by their teachers and peers remembered what they learned longer than children judged to be less curious. Penney and McCann (1964) found the scores of sixth grade students on their Children's Reactive Curiosity Scale were positively related to originality measures. Hogan and Greenberger (1969) established there was a moderate correlation of children's curiosity with academic achievement and IQ.

In an effort to empirically and thoroughly investigate the curiosity of school children, Maw and Magoon (1971) conducted a study to identify how measures of affective, cognitive, personality, and social characteristics would differentiate those

labeled as less curious and those labeled as highly curious by utilizing a multivariate factorial discriminate procedure. They reported that (in order of importance) those students rated as highly curious by their peers and teachers had higher ratings of: effectiveness, loyalty, reliability, accountability, intelligence, and creativity. They also were judged to be better socialized, more secure, and more tolerant of socially uncertain situations. Maw and Magoon concluded that affective development must be fostered as cognitive skills are taught or curiosity cannot be developed appropriately in schools, especially children who are not very curious. These latter children were said to suffer from low self-esteem and would not reach out to the novel and strange; thus, Maw and Magoon recommended altering their learning environments to develop their essential feelings of self-worth. They stressed, "curiosity is a behavior genuinely important in a complex technological society" due to its relationship with social responsibility, personal worth, creativity, and intelligence (p. 2,029).

On the assumption that curiosity is meaningfully related to question asking, Shmidheiser (cited in Maw & Maw, 1978) found curiosity to be the best predictor of kindergarten children's achievement. In a study of 168 first grade students, Krietler, Zigler, and Krietler (1975) extracted five curiosity factors which they contended described the domain of curiosity, i.e., manipulatory, perceptual, conceptual, curiosity about the complex, and adjustive-reactive curiosity. Harty and Beall (1984) determined that students who are highly curious achieved higher grades in science. Kamii and DeVries (1993) found that if children were allowed to be curious and to use their initiatives in pursuing curiosity, they would be more likely to "construct knowledge and go on and on constructing it" (p. 43).

Reeve (1992) proposed an interesting model in which curiosity was the first step in the intrinsic motivation process. In his model, a child encounters an activity, and decides if it is novel or interesting. If so, his or her curiosity would be peaked and exploratory, investigatory, and manipulatory behaviors would be initiated. When the child finds these play-like activities reinforcing because they challenge his or her personal skills and competencies, or they afford a possibility for feedback on personal competence, the activity becomes an intrinsically-motivated activity for that child. Reeves pointed out that adults ultimately apply developed practical skills to discovering how their environments can be changed.

Rigol (1994), in a review of children's fiction and fairy tales, concluded that curiosity is consistently present in much of this literature. She saw this as an indication that curiosity is considered to be an important part of child development. In these stories, the child listener encounters curiosity and exploratory

behavior; i.e., he or she experiences the effects of the stories symbolically and then needs to be curious to understand it and to further compare its contents with his or her own experiences. In addition, by reading these stories, she claimed, the child or adult is reminded of the existence of the curiosity trait with adults in particular learning that children must be curious to develop properly. Therefore, a tradition of developmental necessity and educational preference "is handed down from one reading generation to another, as a canon of expectable human behavior, collected in fiction about and for children" (p. 28).

Keller (1994) employed a longitudinal study of 2- to 9 year-olds to study children's curiosity and exploratory behavior over time. She reasoned that an individual's preference for a manipulative or visual mode of curiosity and exploration is related to the quality of his or her early parent-child relationship. Children with a more pronounced visual orientation to novel and complex situations experienced less interaction with their primary caregiver as they matured than those who preferred manipulation. This lack of parent-child interaction reduces the children's ease in physically dealing with novel and changing situations. These visually oriented children thus tended to seek and process less information, which, according to Keller, is the essence of development.

Trudewind and Schneider (1994) investigated interindividual differences in the development of curiosity and exploratory behavior. After surveying the literature, they believed that these differences could be assessed through either a behavioral or an empirically derived approach to determine the latent structure of the curiosity motive. The behavioral approach evaluates the behaviors of children in their natural environment to determine the strength of their individual curiosity disposition. Alternatively, the empirical approach employs questionnaires, for example, to assess these same curiosity levels. The results of their study indicated that the dimensions derived from their empirical data were "comparable to dimensions extracted from behavioral observations and reported in the literature" (p. 165). Trudewind and Schneider are among a growing number of researchers pointing to the validity of the behavioral approach as a plausible method of exploring the reasons for the high degree of individual variation in curiosity-induced behaviors.

Lampikowski and Emden (1996) claimed that children's creativity is based on their natural "inclination to look at the world with wonder and curiosity" (p. 38). If others discourage a child's curiosity with judgement and criticism, the child eventually learns to mask this trait. Similarly, Chen (1994), Chen and Benesch (1996), and Chen by private phone correspondence (January 7, 1997) recommended that those planning and designing elementary school lessons incorporate elements that foster

curiosity. By doing so, they believed curriculum developers can enhance investigatory actions and question asking, a sense of healthy experimentation, and greater creativity.

Curiosity Research With College Students

Curiosity has also been studied extensively in college students. Fry (1972), upon studying the curiosity dimension, discovered college students who preferred the unexpected and ambiguous scored higher on inquiry process measures. Rodrique, Olson, and Markley (1987) found students induced to be temporarily depressed exhibited less state curiosity and less desire for additional knowledge. On the other hand, Vidler (cited in Maw & Maw, 1978) found no relationship between academic curiosity and test anxiety. Vidler's findings, however, are contrary to conventional wisdom; classroom learning is motivated by curiosity, and is often hindered by student anxieties (Olson, 1986).

Vidler and Rawan (1974), recognizing the need for a valid scale of curiosity suitable for use in a college setting, developed the Academic Curiosity Scale. The scale was shown to be significantly correlated with convergent thinking (Associations III Test) and nonsignificantly to a measure of intelligence requiring speed, accuracy, and visual memory (Digit Symbol Test). In addition, Vidler and Rawan (1975) found their measure of curiosity to be positively related to several measures of academic performance: final grade, grade point average, and reading. In a later attempt to validate the Academic Curiosity Scale, Vidler and Levine (1976) found correlations between instructor ratings and self-ratings of curiosity to be between .23 and .52, with a correlation of .47 for the total group of 110 students.

Olson, Camp, and Fuller (1984), in a correlational study, found a moderate and significant relationship between intelligence and the need for cognition as measured by the Need for Cognition Scale (Cacioppo & Petty, 1982). Cacioppo and Petty claimed the scale was related to curiosity in that curiosity involves the desire for cognitive exploration or the "desire to know more about himself or his environment" (p. 2).

Reeve (1989), with a group of 57 college volunteers, probed into curiosity's relationship to intrinsic motivation. In both his mediation models, the stimulus predicted collative motivation (curiosity), which, in turn, predicted intrinsic motivation. Thus, by employing path-analytic techniques, he was able to demonstrate that Berlyne's (1960) collative motivation (curiosity) mediated between various experimental stimulus patterns and interest or enjoyment, i.e., his two theorized dimensions of intrinsic motivation.

Curiosity Research with Adults

While there has been a moderate amount of research regarding animals, children, and college students, little attention has been paid to curiosity among adults (Tucker, 1986).

Tough (1969) discovered "satisfaction of curiosity" was the second most commonly expressed reason for engaging in adult learning projects. Likewise, Carp, Peterson, and Roelfs (1974), in a national survey designed to ascertain learning interests, preferred modes of learning, perceived barriers to learning, etc., discovered that 35 percent of the would-be learners (the second largest number of respondents) indicated that to "satisfy curiosity" was "very important" when asked about their reasons for learning. Moreover, 32 percent of the respondents designated "satisfy curiosity" as their reason for participating in a learning activity. Candy (1991) claimed that by emphasizing self-directed learning activities as a method of instruction "will arouse curiosity...and increase information-seeking activities" (p. 57). Therefore, the importance of curiosity in self-directed learning activities seems to be particularly important.

Due to what was described as a lack of information about adult curiosity, Rossing and Long (1981) directed a study based on Berlyne's (1960) theory of epistemic curiosity, using adults as subjects. The study investigated the relationship between "perceived value" as a source of extrinsic motivation and "surprise" as a source of intrinsic motivation for learning or seeking new knowledge. The overall results of their research indicated that while curiosity was an important motivator of adult learning, the perceived value or relevance of the material to be learned seemed to overrule curiosity in determining motivation to learn. The results offer credence to Kidd's (1973) assertion that adults must see some relevance or perceive some value to learning. Nevertheless, the design of their experiment could have limited their results because of limited statistical power (Cohen & Cohen, 1983).

Camp, Rodrique, and Olson (1984) followed the research of Rossing and Long (1981) by first trying to replicate it, and then exploring the relationship between age level and trait-like measures of specific and diversive curiosity. Their results supported Rossing and Long's work in that they found a significant positive relationship between perceived value and the desire for more knowledge (curiosity). Their results, too, could have been limited like those of the Rossing and Long study. But based on Rossing and Long's results ($r = .44$ between surprise and desire for additional knowledge), the 100 subjects in their study should have been acceptable for sufficient statistical power. One can only lament that they did not increase the number of their subjects to 160, because statistical significance between the two

aforementioned variables would have been more assured. Further, they found no significant age effects between age level and specific curiosity, whereas diversive curiosity was found to be significantly related to age. The younger age group seemed more likely to be aroused to seek stimulation as a result of boredom than the middle-aged or the older group.

Camp et al. (1984) suggested that researchers should not expect older adults to be less curious, but should note their willingness to expend energy to seek stimulation. They claimed the evidence indicated that once older adults are stimulated to participate, they might demonstrate more curiosity. According to Labouvie-Vief (1980), however, it is more difficult to convince older adults to perform meaningless research tasks. Thus, older adults may not be willing to perform nonmeaningful tasks, and this unwillingness probably has little to do with their ability to perform them.

Giambra, Camp, and Grodsky (1992) reported interest in learning, i.e., information seeking as indicated by the curiosity for people or things, does not lessen as people age. In their study, they observed that older adults differed from younger adults with respect to the nature of the information they sought: Younger adults preferred to learn through direct interaction, while older adults preferred to learn through more passive means, such as reading.

With respect to gender, Giambra et al. (1992) found that women demonstrated much greater "curiosity for people" than men, who were "curious for things." Nevertheless, curiosity for interpersonal issues decreased with age for both men and women while curiosity for things increased. (These changes were only statistically significant for women). The researchers suggested such changes might reflect a trend toward a more androgynous set of social norms with advancing age. Overall, these findings led Giambra, Camp, and Grodsky (1992) to conclude, "adults need only the opportunity to learn and seek out information that is offered in a form compatible with their preferences" (p. 156).

Cavalieri (1996), in a qualitative research study of famous inventors, found that problem solving was curiosity driven. She noted that the Wright brothers, upon experiencing many failures in developing the airplane, were driven by curiosity to solve their engineering problems and to try and try again. She gave another example, Art Jones, who was apparently driven by curiosity only to build the best exercise equipment in the world (Nautilus).

Although there has been some minor investigation into the relationship between curiosity or the desire for learning and age levels, curiosity and gender differences, and curiosity's importance in motivating adult learning, much research is needed

to clarify its significance in various adult learning contexts, such as the workplace. Such research could help shape a more balanced view about curiosity's role and importance in adult learning.

The Definition of Curiosity

Bindra (1959) complained that most attempts to discuss curiosity lacked sufficient explanation. Maw and Maw (1962) decried the apparent lack of a precise statement as to the nature of curiosity. Furthermore, Vidler (1977) claimed that although "the term curiosity has a lengthy and respectable lineage," there is an absence of adequate explanations about exactly what it is (p. 17). Ainley (1987) stressed that the wide range of terms associated with curiosity have been used interchangeably, while Krietler and Krietler (1994) remind us that the nature of curiosity is still far from clear.

Berlyne (1960) drew a useful distinction between intrinsic and extrinsic exploration. External stimuli such as novelty, conflict, surprisingness, and complexity create an internal arousal (curiosity), and the reduction of that arousal is accomplished by exploratory action or behavior. Intrinsic exploration is behavior unrelated to a goal, i.e, it is an activity for its own sake. Conversely, extrinsic exploration has clearly definable consequences, such as reaching a goal obtaining food. Vidler (1977) reported this distinction has aided in the clarification of curiosity and has subsequently guided research.

According to Loewenstein (1994), Berlyne further assisted curiosity research by locating curiosity along two dimensions: one between epistemic and perceptual curiosity, and the other between specific and diversive curiosity, resulting in a four-fold classification of the construct. First, epistemic curiosity refers to a desire for information and knowledge, while perceptual curiosity concerns one's attention to novel objects in one's immediate environment. Further, Berlyne (1960) defined specific curiosity as the desire for a particular piece of information, such as when one is trying to solve a puzzle. His diversive curiosity, conversely, referred to the seeking of stimulation as a result of boredom.

There are many examples of this four-way classification of curiosity. Specific epistemic curiosity is illustrated by a new employee's search for an answer to a particular problem. Diversive epistemic curiosity could be exemplified by a bored cab driver flipping through his or her car radio's stations. Driscoll (1994) gave an interesting example of specific perceptual curiosity, i.e, she stressed a history teacher could don a costume representative of the next era he or she would cover in class, thereby grabbing the student's attention and stimulating their curiosity about what is to come next (this could certainly work

for adults as well). Diversive perceptual curiosity could be exemplified by employees exploring the grounds of their workplace with no particular purpose in mind. Accordingly, in educational settings, specific epistemic curiosity would seem to be of greater importance because it is concerned with information and knowledge gathering to solve problems, answer questions, and the like.

While there have been gains in clarifying the definition of curiosity, researchers with their various approaches and views have further obfuscated the issue as well (Ainley, 1987; Byman, 1993; Krietler & Krietler, 1994; Vidler, 1977; Voss & Keller, 1983). Voss and Keller (1983) described this situation best when they stated, "A lot of confusion is caused by the fact that the term curiosity is used both as a description of a specific behavior as well as a hypothetical construct to explain the concept in organismic terms" (p. 17). Consequently, curiosity has often been confusingly considered synonymous with a host of other terms such as: "exploration," "interest," "manipulation," "sensation seeking," and "attention." Rossing and Long (1981) claimed this lack of definitional and conceptual clarity has led to many adult educator's lack of appreciation for the importance of curiosity in diverse learning contexts.

The Measurement and Conceptualization of Curiosity

Byman (1993) and many others (e.g., Krietler & Krietler, 1994; Langevin, 1976; Olson & Camp, 1984) have asserted that the wide variety of instruments developed to assess curiosity has also contributed to the confusion in defining and conceptualizing it. Nevertheless, Vidler (1977) and Loewenstein (1994) maintained this difficulty stimulated the positive wave of varied inquiry into the nature of curiosity.

The Measurement of Curiosity

In experiments with primates, the animals were most often observed in various laboratory situations (e.g. mazes), and variables such as "manipulatory" and "exploratory" behavior were recorded. The amount of exploratory behavior was then assumed to be a demonstration of the animal's level of curiosity (e.g., Montgomery, 1953; Myers & Miller, 1954).

In human studies, a variety of curiosity-measuring instruments have been developed. Most studies have focused on preschool and elementary school children and are generally based on teacher's and peer's observations and ratings of children's behavior in classroom settings (e.g., Trudewind & Schneider, 1994).

Most adult curiosity research, however, has been dependent upon paper-and-pencil, introspective test instruments distinguishing between different types of curiosity, e.g., "State" and "Trait," "Sensation Seeking," and "Novelty Seeking." Voss and

Keller (1983) claimed these studies were efforts to more closely identify the exact nature of curiosity.

Some meaningful efforts to measure and therefore clarify curiosity have also been determined by approach. Day (1971), Naylor (1981), and Boyle (1983, 1989) preferred to emphasize individual differences (curiosity as a personality trait) and the stability of behavior (curiosity as a motivational state) in different situations. Berlyne (1960), Fowler (1965), Rossing and Long (1981), and Driscoll (1994), on the other hand, all stressed the importance of curiosity in motivating and directing behavior such as learning.

Factor-Analytic Research

Berlyne (1954, 1960) was among the first to discuss the multidimensional nature of the curiosity construct. As stated above, Berlyne claimed curiosity has two dimensions: the epistemic/perceptual and specific/diversive curiosity dimensions. Nevertheless, Berlyne believed that some multivariate statistical technique would ultimately be able to unify these various types of curiosity.

Krietler and Krietler (1994) interpreted Olson and Camp's (1984) factor-analytic study as indicating there is only one curiosity factor. However, further investigation of Olson and Camp's original research (by examining their curiosity total scale analyses) indicated they really believed there were two clear curiosity factors (i.e., "General Curiosity" and "Experience Seeking").

Vidler (1977) pointed to further evidence of curiosity's multidimensionality: the low to modest intercorrelations between the extensive range of instruments purportedly measuring curiosity. Thus, although some evidence exists to indicate that the various measures of curiosity are indeed measuring the same variable, their compatibility is much less than desirable, suggesting that curiosity is quite definitely a multidimensional construct. This observation was mirrored by Voss and Keller (1983) who declared, "It should be clear that curiosity cannot be considered as a unitary, one-dimensional construct of the kind suggested by Cronbach (1960)" (p. 18). To date, consequently, there have been no reports in the literature about the unidimensionality of curiosity; thus, Berlyne's dream has not been realized.

In alternative efforts to continue to clarify the nature of the curiosity construct, researchers like Langevin (1976), Olson and Camp (1984), Ainley (1987), and Byman (1993) used adult populations to answer self-reported, questionnaire measures of curiosity. The participant's total and subscale scores on the instruments were then factor analyzed to determine a parsimonious

number of curiosity factors. These researchers believed these factor-analytic studies would support their hypothetical notions of what exactly curiosity is, thus facilitating further exploratory research. Nevertheless, according to Byman (1993), what has resulted is further confusion and controversy.

"Breadth-of-interest" curiosity and "Depth-of-interest" curiosity. Langevin (1971), noting the need to test the hypothesis that curiosity is multifaceted, compared five representative curiosity measures and two intelligence instruments. The data were intercorrelated and subjected to maximum likelihood factor analysis. He concluded that the curiosity measures were distinct from IQ tests. Two weak curiosity factors emerged, i.e., breadth-of-interest and depth-of-interest curiosity (the breadth and depth factors accounted for 12.5 percent and 6.6 percent of the total variance, respectively). He claimed that the breadth-of-interest curiosity style may reflect both a personality dimension and diversive curiosity. Further, he thought that the depth-of-interest curiosity style may alternatively reflect the intensity of a motivational state and specific curiosity.

Ainley (1987), with a population of 227 teacher education students in Australia, continued Langevin's (1971) Canadian research. She noted that Langevin (1976) later claimed that the two aforementioned weak curiosity factors may be simply artifacts of the difference between combining two kinds of curiosity instruments (teacher ratings to self-report questionnaire measures). She instead used eight self-reported questionnaire measures with an adult population to correct for the possible artifact problem. After factor analyzing five distinctly different curiosity instruments (from the Langevin study), she concluded that there was not a unitary curiosity factor; moreover, she interpreted the varimax rotated factors to mean there was either a two-factor or a three-factor solution (there were initially five factors, however only three had eigenvalues greater than one). She preferred the two-factor solution and thus supported Langevin's two-factor curiosity model. She believed the results of her research were "consistent with the general pattern of findings reported in the literature" and afforded conceptual clarity (p. 56).

Nevertheless, considerable controversy exists over Ainley's (1987) interpretations (Boyle, 1983, 1989; Byman, 1993) as there were really three clear, strong factor groupings, with the third factor accounting for an extra 9.1 percent of the total variance. Boyle was especially critical of Ainley's work, citing the fact that she ignored for convenience's sake, the Scree-test and Kaiser-Guttman criteria which clearly pointed to three factors. Even Boyle was slightly incorrect in his assertions; as Ainley

reported in her article, the Scree-test only called for two factors.

Byman (1993), noting Ainley's (1987) seemingly contradictory findings, reanalyzed the correlation matrix of the 12 curiosity subscales from her research and subjected it to a confirmatory maximum likelihood factor analysis technique known as LISREL (Joreskog & Sorbom, 1989). He also found that there was considerable statistical evidence for the existence of three curiosity factors, not simply two.

Loewenstein (1994), added to the confusion as he claimed that the breadth and depth of interest curiosity factors were manifestations or categories of one only kind of curiosity, i.e., specific curiosity. He defined breadth curiosity as the number of interests an individual has, whereas depth curiosity reflects the degree to which an individual might pursue a single area of interest. Although the breadth-depth distinction appeared similar to the distinction existing between diversive and specific curiosity, he thought both were really instances of a desire to seek information, not a desire to seek stimulation in general.

Nevertheless, by simply viewing breadth and depth curiosity along a continuum of interests, Loewenstein seems to have strayed from Langevin (1971) and Ainley's (1987) original definitions (Spielberger & Starr, 1994). It is clear both Langevin and Ainley considered breadth curiosity an orientation to seek varied and changing experiences as a result of boredom, with an emphasis on actually physically experiencing what the novel event is like. The main point here is that while breadth curiosity does reflect one's diversity of interests per se, it also indicates a desire for stimulation, that is, stimulation to avoid boredom, an aversive state. Therefore, Langevin and Ainley's definition of breadth curiosity is very much like Day's (1971) description of diversive curiosity and does not appear to be a part of specific curiosity. Again this information is presented as a further demonstration of the contradiction evident in the field.

State and Trait curiosity. During roughly the same time, different researchers tried to pursue clarifying the nature of curiosity by considering it in more global terms, i.e., State and Trait curiosity. Day (1971) extended Berlyne's (1954, 1960) path-breaking work by proposing that curiosity not only existed as a transitory motivational state, but as a personality trait as well. Leherissey (1971, 1972), Spielberger et al. (1980), Boyle (1979, 1983, 1989), and Naylor (1981) have all supported this State and Trait distinction for the sake of parsimony and clarity. Boyle (1983) regarded breadth and depth curiosity as mere manifestations of mostly one kind of curiosity, i.e., specific curiosity (state curiosity), thus making them unsuitable for stimulating future

research (Spielberger and Starr [1994] considered Ainley's [1987] work to be complimentary, rather than contradictory to Boyle's).

Further factor-analytic research. Olson and Camp (1984), in an effort to validate Langevin's (1976) research with an adult population, used six self-reported curiosity measures (only two of which were used in Langevin's study) to discover curiosity's exact nature. Factor analysis of the total scale scores yielded a two-factor solution, and they labeled the factors as General Curiosity and Experience Seeking. A factor analysis of the subscale scores resulted in a three-factor solution, however, with the new factor being identified as Venturesomeness. Byman (1993) offered this research as support for his three-factor solution.

Giambra, Camp, and Grodsky (1992) considered Olson and Camp's (1984) general curiosity/ experience seeking distinction to be quite useful, yet argued to change the factor names to Information Seeking and Stimulation Seeking. In addition, they considered Olson and Camp's two factors to be synonymous with Ainley's (1987) depth/breadth curiosity dimensions.

From all this confusion in the literature, two things seem assured: Curiosity is not a unidimensional construct and a very real need exists to clarify its nature. This could be accomplished by considering and using the variety of perspectives and measures the prevailing research recommends in efforts to guide additional curiosity investigation. The resulting new knowledge about curiosity's nature may, in turn, more concretely illustrate curiosity's importance to educational practitioners and theorists alike.

Curiosity and the Learning Process

While the importance of curiosity to the learning process has been generally acknowledged, there has been some lack of agreement among curiosity researchers as to its nature, form, and degree of relevance in learning (Ellis, Koran, & Koran, 1991; Maw & Maw, 1978; Rossing & Long, 1981).

Curiosity and Cognitive Development

According to Ginsburg and Opper (1988), Flavell, Miller, and Miller (1993), and others, Piaget viewed curiosity as an important part of normal cognitive development. Infants, for instance, through a process of perceptual learning, repeatedly look at things to become acquainted with their environment (e.g., their cradle). At about 3 months of age, infants' attention begins to be directed to novel objects or movements connected with their cradles. Thus, their visual preferences become more selective and are directed to those objects that are moderately novel; objects too familiar or too new are ignored. Piaget believed the former object would be ignored because the infant would be satiated with it; he thought infants would disregard the latter object because it did not correspond to anything in their cognitive schemes.

What arouses infants' curiosity, in other words, is not solely the physical nature of the object, but rather the extent of the relation between the new object and the infants' previous experiences. Vidler (1977) believed Piaget's theoretical position implicitly assumed curiosity to be a primary motivational force for the growth of a child's understanding of the world. Similarly, Ginsburg and Opper (1988) viewed Piaget's "moderate novelty principle" as an important motivational principle, since a child, contrary to popular thought, actively seeks out stimulation or moderate novelty to learn about their surroundings and ultimately to facilitate cognitive development (p. 39).

Berlyne's Theory of Curiosity

Berlyne (1960) and many others (e.g., Day, 1982; Driscoll, 1994; Rossing, 1993; Tucker, 1986) viewed curiosity as an important part of the learning process, i.e., they believed it to be a strong motivator and director of learning. As the leading proponent of this perspective, Berlyne (1960) proposed two basic types of curiosity: perceptual and epistemic (in later research, he also identified specific and diversive curiosity). Perceptual curiosity is initially stimulated by novel, complex, incongruous, doubtful, or perplexing stimulus patterns (what he referred to as collative variables) in the environment. These collative variables all induce a perceptual conflict or uncertainty, leading the individual to compare information (taken in through the sense organs) and initiate exploratory behavior. Thus, curiosity is a state of conflict that additional information will alleviate.

Berlyne's (1960) second type of curiosity, epistemic curiosity gives the organism knowledge. Berlyne defined knowledge as a structure of symbolic reaction that remains with the organism as part of the fruits of learning.

Epistemic curiosity arises as the result of being stimulated by the collative properties of a stimulus pattern, which induces a conceptual conflict "or conflict between symbolic response-tendencies-beliefs, attitudes, or thoughts" (Berlyne, 1962, p. 27). This conceptual conflict, in turn, stimulates the quest for knowledge and is relieved by the acquisition of knowledge. Berlyne (1960) claimed the mechanisms of epistemic behavior were as follows:

1. Epistemic observation, e.g., observing how others complete job tasks.
2. Consultation, such as searching for information in books and asking coworkers for information.
3. Directed thinking, which can occur in conjunction with the first two possibilities or as an activity in itself.

While extremely compelling, Voss and Keller (1983) considered Berlyne's (1960) perception-directed and knowledge-directed conception of curiosity to be spurious and confusing. They noted Berlyne himself admitted the two forms of curiosity often appeared simultaneously and were not always distinct from each other. They contended, too, that "Information gained by perceptual processes is symbolically coded so as to be available in the future and thus influence behavior" (p. 46). Therefore, they considered it possible for the information derived from perception-directed curiosity to be also stored as knowledge.

According to Boyle (1983), Berlyne's (1960) curiosity theory was limiting because it essentially ignored the existence of trait curiosity. Thus, Berlyne was really concerned with curiosity as a transient motivational state. Day (1971), although allowing for state curiosity, instead proposed to extend Berlyne's work by studying curiosity as an enduring personality trait. Pearson (1970), with her examination of the "need-for-novelty" domain, and Zuckerman (1979), with his exploration of the "sensation-seeking" domain, too, regarded curiosity as a trait as well. Leherissey (1971, 1972), Boyle (1977), Spielberg et al. (1980), and Naylor (1981) also favored pursuing curiosity research through investigation of the state-trait distinction. Alternatively, Langevin (1971, 1976) and Ainley (1987) factor-analyzed several of the then current curiosity instruments and extracted two curiosity factors: which were labeled as breadth of curiosity (diversive and trait curiosity) and depth-of-curiosity (specific and state curiosity).

Although Berlyne's conception of curiosity has been challenged, it still remains as the basis of much curiosity research and is the most widely accepted curiosity theory. Indeed, Voss and Keller (1983) reminded us that scarcely an article exists that does not refer to some portion of his elaborate and complex theory.

Sustaining Curiosity in Learning Settings

Learners, in an effort to secure more information and learn about a stimulus, pay more attention to unexpected events and are also motivated to test new methods of perceiving what they are observing (Driscoll, 1994). In classroom or training settings, Driscoll (1994) stressed perceptual curiosity could be maintained by varying instructional approaches, such as keeping learners alert by interjecting relevant humor, varying one's tone of voice, and variously alternating group activities and demonstrations with lecture. These activities, she claimed, would sustain curiosity and thus serve as a continuing source of learning motivation.

Driscoll (1994) claimed epistemic curiosity or "inquiry arousal" can be stimulated and maintained by assigning learners very complex, yet real, problems to solve. With sufficient clues

and the information necessary to solve the problems, one can enhance learners' motivation by allowing them to experience the complexity of problems characteristic of real life situations.

Curiosity, IQ, Creativity, and Academic Achievement

In efforts to clarify the relationship of curiosity to other variables such as learning, researchers have investigated what the literature has proposed as correlates of the curiosity construct.

The relationship between curiosity and IQ has often been proposed, yet research has yielded results ranging from an absence of any significant relationship (Day, 1968a; Penney & McCann, 1964) to a moderate relationship between the two (Hogan & Greenberger, 1969). Maw and Maw (1978) believed intelligence's relationship to curiosity is so relevant that they controlled for IQ when conducting their experiments with school age children. In two major factor-analytic studies (Ainley, 1987; Olson & Camp, 1984), curiosity had little to no relationship with those studies' intelligence measures (ACER Advanced Test and ACT test, respectively) as well. To date, no study has found more than a moderate relationship between curiosity and intelligence.

Zuckerman (1994) and Vidler (1977) claimed the idea of a positive relationship between curiosity and creativity has received strong support in the literature. Penney and McCann (1964) found scores on their Children's Reactive Curiosity Scale correlated with Guilford's Unusual Uses Test. Torrance (1967) considered curiosity to be virtually the same as creativity. In his research, students rated as more curious scored higher than less curious students of equal intelligence on several measures of creativity. Day (1968) reported a significant correlation between two self-report measures of curiosity and the Remote Associates Test (creativity). Vidler (1977), in addition, claimed curiosity and creativity were moderately correlated. Voss and Keller (1983), after an extensive literature review, concluded that curiosity was an early stage in the process of creative thought. Lastly, Podd'iakov (1992) considered curiosity and exploratory behavior as the nucleus of creativity.

Curiosity has often also been related to academic achievement. Maw and Maw (1961) found that highly curious children remembered what they learned longer and learned more from a given exposure to information than less curious children (by performing better on a story retention task). Hogan and Greenberger (1969) observed a positive, moderate relationship between standardized measures of academic achievement and curiosity. Vidler and Rawan (1974, 1975) presented some evidence of a positive correlation between their measure of academic curiosity and academic learning performance (final course grade, grade point average, and reading). Likewise, Jones (1979) found a

weak positive correlation between curiosity and a college final exam score.

While the literature indicates some relationship between children's and adolescent's curiosity and academic achievement or learning performance, there has been virtually no examination of the relationship between curiosity and measures of learning performance in adult learning settings.

Socialization-Related Learning

Much of the effort to elucidate the nature of the socialization process has concentrated on an employee's adoption of organizational values, goals, and attitudes (e.g., Schein, 1988). More recently, however, a much greater emphasis has been placed on viewing the process from a learning perspective (socialization-related learning). Ostroff and Kozlowski (1992) and others (e.g., Copeland & Wiswell, 1994; Kozlowski, 1995; Miller & Jablin, 1991; Morton, 1993) have claimed that organizational socialization should be viewed primarily as a process of formally and informally communicating and transmitting an organization's technical job knowledge, culture, norms, and procedures. Through mostly informal means, new employees need to be actively involved in gathering the appropriate information to learn their jobs. Therefore, the organizational socialization process is essentially an information-seeking process which relies heavily on new employees taking a proactive role in acquiring information to resolve uncertainties and to master the technical and interpersonal skill requirements of their positions.

Miller and Jablin (1991) considered the socialization process, particularly at organizational entry, to be an information-seeking process initiated by a state of high uncertainty. They cite two types of uncertainty, "effort-behavior" and "behavior-outcome." Effort-behavior uncertainty occurs when one questions whether one can do one's job. It parallels self-efficacy concerns and fades with progressive successes in job assignments. Behavior-outcome uncertainty is the uncertainty arising from conflicting information about what constitutes a good performance. It takes many more months to resolve.

To resolve the uncertainties about one's new job setting, its relevant features, and how to accomplish one's required tasks, one must learn through "trial and error, watching, asking, reading, and practice" (Wiswell, 1993, p. 1). This applies to new employees as well as seasoned workers since this socialization-related learning occurs each time a new employee enters an organization. It also applies when they switch to another department, are promoted, get a new coworker or boss, learn a new job task, or even go back to school (Morton, 1993; Schein, 1988).

Employees, therefore, turn to many information sources and employ many information-seeking tactics to make sense of their new job experiences. These information sources include coworkers, supervisors, subordinates, and clients (Morton, 1993). Copeland and Wiswell (1994) inform us that individuals will first try to establish relationships with these interpersonal information sources (coworkers and the immediate supervisor in particular), then, through these relationships, learn the norms, values, procedures, and, lastly, the job knowledge necessary to perform their jobs. Miller and Jablin (1991), moreover, declared that the information-seeking tactics employed in the socialization process include asking direct and indirect questions, observation, and surveillance, activities that are all context-dependent. For instance, observation would more probably be used with coworkers because they perform tasks more like the new employee's tasks. Surveillance, on the other hand, "requires new hires to use their retrospective sensemaking skills by integrating novel stimuli with past experiences"; it would be used much more frequently during newcomer socialization due to increased sensitivity to novel stimuli (Miller & Jablin, 1991, p. 112).

What possible role, then, does curiosity have in the socialization process? Berlyne (1954, 1960, 1978) defined curiosity as a state of increased arousal, promoted by uncertainty and lack of information, resulting in exploratory behavior and the search for information and knowledge. External stimuli such as novelty, uncertainty, conflict, surprisingness, and complexity (i.e., "collative stimuli,") create this internal arousal. The reduction of that arousal, which the individual finds pleasing, is accomplished through exploratory action (Berlyne, 1960).

Berlyne (1960) posited that curiosity manifests itself in three epistemic (information or knowledge-seeking) ways: observation, consultation, and thinking. Berlyne claimed that during the first of these, observation, individuals place themselves in situations that will foster learning. He cited examples ranging broadly from seeking gossip to the systematic observations and experiments of science. During consultation, individuals choose to obtain verbal and written information. Examples of this include asking questions of coworkers or supervisors, reading organizational literature, and writing letters. Finally, there is thinking. Berlyne considered epistemic thinking part of "productive" or "creative" thinking. Thinking in this sense refers to individuals gaining permanent possession of new knowledge. It differs significantly from "reproductive" thinking, where remembered material is called up to handle problematic situations.

As mentioned previously, new employees, in a necessarily high state of arousal, are motivated by feelings of uncertainty and employ many information sources and strategies to learn the

interpersonal and technical requirements of their jobs. Among newcomers' socialization-related learning endeavors, Berlyne's (1960) collative variables (i.e., novelty, uncertainty, conflict, surprisingness, and complexity) have particular relevance. Novel stimuli are more readily explored, the results of complex procedures are reflected upon, surprising information is remembered more clearly, and conflicting data are pondered. These activities all result in the assignment of meaning to present experiences, thereby assisting in the development of new cognitive maps (Miller & Jablin, 1991). All of these manifestations of epistemic curiosity and exploratory behavior are accompanied by observational, consultative, and thinking tactics which result in vital learning. Without this learning, newcomers are not likely to be socialized, turnover is more assured, and the organization will more probably suffer.

While there seems to be a logical conceptual link between socialization-related learning and adult curiosity, no empirical research has been attempted to establish if indeed there is a relationship between adult curiosity and learning in the socialization process, and if so, to what degree. Thus, research is needed to fill this gap in our understanding of curiosity's role in adult learning environments like the workplace.

Curiosity and Job Performance

The notion that continuous learning, in general, is a necessary component of a workplace capable of adroitly handling change can scarcely be argued against. One facet of learning in an adult context could be an individual's degree of successful socialization-related learning, especially for newcomers (Morton, 1993; Ostroff & Kozlowski, 1992). Moreover, another manifestation of learning could be the performance of one's job, as it is unlikely one could perform their job for any period of time without the benefit of some prior and continuous learning (Miller & Jablin, 1991).

McCloy, Campbell, and Cudek (1994) defined performance as "behaviors or actions that are relevant to the goals of the organization in question...[and it] is multidimensional" (p. 493). Motowidlo and Van Scotter (1994) also argued the construct of job performance is multidimensional and identified two "conceptually satisfying" underlying dimensions, i.e., task performance and contextual performance (p. 475).

Task or technical job performance is the behavior associated with maintaining and servicing an organization's technical core. Motowidlo and Van Scotter (1994) described task performance as directly transforming the raw goods of an organization into the goods and services that it produces. Examples of this would be teaching a college class, cashing one's paycheck at a bank, operating a printing press in a newspaper plant, or planting a

tree. By contrast, Motowidlo and Van Scotter believed contextual or interpersonal job performance, which is a function of one's interpersonal skill knowledge, supports the broader social environment in which the technical core must function. Specifically, interpersonal job performance is most closely related to the helping and cooperative elements of desirable organizational behavior.

Nevertheless, while curiosity is often reported to be an important part of the learning process (Berlyne, 1960, 1965; Day, 1971, 1982; Driscoll, 1994), and learning is indeed positively related to successful workplace adaptation and levels of job performance (Ostroff & Kozlowski, 1992), no research has been undertaken to determine the possible effects of curiosity and learning on different facets of job performance.

Chapter Summary

Chapter II reviewed the existing literature and first included a discussion of a broad range of animal and human curiosity research. Curiosity is an essential component of learning, yet there has been little empirical investigation of its role in adult learning contexts like the workplace.

The socialization literature was reviewed as well. The socialization process has been increasingly viewed as a learning process where employees proactively seek technical and interpersonal information to "learn the ropes" of the organization. Nevertheless, little research existed about the possible relationship of socialization-related learning and the ultimate indicator of workplace learning, job performance.

Although some support exists for the relationship between curiosity and classroom learning performance, no research was found that related job performance to adult curiosity.

Thus, the literature review revealed a very real need to investigate the possible influence of curiosity on adult learning in general, and in workplace learning in particular. This information would possibly alert adult educators to the importance of curiosity in motivating and directing adult learning, and HRD practitioners to the need to consider fostering curiosity and learning in the workplace.

CHAPTER III METHOD

This chapter will include information concerning the description of the population and sample, the design of the study, the variables to be examined, and the instrumentation, procedures, and data analyses that will be employed to investigate the interrelationships among curiosity, socialization-related learning, and job performance as they address the research questions.

The proposed research questions were as follows:

1. What is the relationship of selected measures of curiosity to socialization-related learning?
2. What is the relationship of selected measures of curiosity to different facets of job performance?
3. What is the extent of the possible mediating effect of socialization-related learning among the a priori determined variables: curiosity and job performance? (i.e., To what extent does socialization-related learning mediate the relationship between curiosity and job performance?).

The major purpose of this study was to ascertain and clarify the potential relationships among the identified variables and to determine the causal influences of the respective independent variables (curiosity and learning) on job performance. Thus, the potential contributions of curiosity and socialization-related learning to job performance will hopefully become clearer.

Subjects

There were 233 subjects in this study. The population was comprised of individuals from four service-industry organizations. The organizations were selected to be participants in this study on the basis of sharing similar corporate philosophies about customer service and quality. The population includes sales and marketing personnel, managers, customer service representatives, customer service trainees, and administrative aides.

Instrumentation

Curiosity Measures

From the realm of curiosity instruments reported in the literature, four were chosen to represent the types of items and content which have been used to measure the construct in adults. These instruments will alternatively assess the subject's State and Trait curiosity, Sensation- or Stimulation-Seeking level, and tendency toward Novelty Experiencing. All the instruments have been validated and, as recommended by Ainley (1987), each of the

selected measures will be pencil-and-paper, self-reported curiosity scales.

The variables of interest were grouped into four areas, along with the selected instruments to measure them and their subscales. This information is summarized in Table 3.1. The variables include: job performance, background data, socialization-related learning, and curiosity. Due to the interest in determining curiosity's causal influence on job performance, which is likely to be mediated through learning, curiosity will be designated as an independent variable. The remaining independent variable will be socialization-related learning. The dependent variable will be job performance.

State and Trait Curiosity. State and Trait Curiosity was measured by the Melbourne Curiosity Inventory (MCI; Naylor, 1981) and the State-Trait Personality Inventory (STPI; Spielberger, Barker, Russell, Silva De Crane, Westberry, Knight, & Marks, 1980).

The MCI contains 40 self-report, 4-point Likert scale questions, 20 for each scale (1=almost never; 4=almost always). The State Curiosity scale asks the respondent to designate how they feel at a particular moment, while the Trait scale, with the questions worded somewhat similarly, asks the respondent to answer how they feel in general.

The STPI includes 60 self-report, 4-point Likert scale items, consisting of six, ten-item State and Trait scales measuring anger, anxiety, and curiosity (1=not at all; 4=very much so). Nevertheless, since the focus of this research is curiosity, only the State and Trait curiosity scores will be used. The items, too, are very similarly worded for each State-Trait scale; however, two questions are reversed coded for each subscale (12 questions overall).

Sensation Seeking. The Sensation Seeking Scale-Form V (SSS V; Zuckerman, 1979) is a 40-item personality trait scale designed to measure sensation seeking (all are dichotomous scales where 0=negative response; 1=positive response). The test consists of a Total Scale (TOT) and four factor subscales: Disinhibition (DS), Boredom Susceptibility (BS), Thrill and Adventure Seeking (TS), and Experience Seeking (ES). Zuckerman, Ulrich, and McLaughlin (1994) defined sensation seeking as "...the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experiences" (p. 563).

Table 3.1 Study Variables, Measures, and Subscales

Variables	Measures	Measure Subscales
Dependent		
Job Performance	Performance Evaluation Sheet	Technical Job Performance Interpersonal Job Performance
Independent		
Background Data	Background Information Sheet	
Socialization-Related Learning	Socialization-Related Learning Scale	Job Knowledge Acculturation to the Company Establishing Relationships Satisfaction With Learning Experiences
Curiosity	Melbourne Curiosity Inventory	State Curiosity Trait Curiosity
	State-Trait Personality Inventory	State Curiosity Trait Curiosity
	Sensation Seeking Scale-Form V	Boredom Disinhibition Experience Seeking Thrill & Adventure Seeking
	Novelty Experiencing Scale	Internal Cognitive External Cognitive Internal Sensation External Sensation

The DS subscale represents the seeking of sensation stimuli through sexual activity, partying, and drinking. On the other hand, BS reflects a low tolerance for boredom and a restlessness when there is a lack of varied stimulation in the environment. TS describes the desire to seek sensation stimuli through unusual or sometimes risky physical activities like mountain climbing. The fourth subscale, ES, measures the seeking of unusual experiences and sensations and the unconventionalness of an individual's lifestyle. Finally, the TOT score is a summation of the four subscale scores.

Novelty Seeking. The Novelty Experiencing Scale (NES; Pearson, 1970) is an 80-item personality trait scale, consisting of four 20-item subscales measuring the Novelty Experiencing or the desire or motivation for new experiences (all are dichotomous scales where 0=dislike; 1=like). The tendency to seek novelty is broken down into four scales on the basis of the source of stimulation and the type of subjective experience. The source of stimulation can be internal or external to the individual, while the subjective quality of the experience is either cognitive or sensational. Pearson combined these classifications into a 2 x 2 model, yielding four forms of the tendency toward Novelty Experiencing: External Cognition (EC), Internal Cognition (IC), External Sensation (ES), and Internal Sensation (IS).

Socialization-Related Learning

The Workplace Adaptation Questionnaire (WAQ; Morton, 1993) is a self-reported 19-item instrument, consisting of three subscales developed to measure employee socialization-related learning and one to measure satisfaction with learning experiences (measured on 5-point Likert scale where 1=strongly disagree; 5=strongly agree). This study's modified version of the instrument utilized an additional three high-loading Job Knowledge questions from the original Morton study to balance the instrument (now 22 items overall); many of the questions seemed to be biased more toward interpersonal skill knowledge. The four subscales are as follows: Job Knowledge (JK), Acculturation to the Company (AC), Establishing Relationships (ER), and Satisfaction with Learning Experiences (SLS). JK refers to the extent the respondent reports mastering the tasks of his or her job and consists of eight questions. AC is a five-item subscale that measures an employee's degree of learning the norms, values, and culture of the organization. ER, the third subscale, contains five items that assesses the employee's capacity to identify coworkers who could provide useful information or who know their way around the organization. Lastly, the four-item SLS subscale evaluates the employee's satisfaction with the learning experiences one has encountered while at the organization (this subscale was not examined in this research; thus, only the three learning subscales of the WAQ were used in this study).

A PCA extraction with varimax rotation was then used to determine the stability of the subscale factors of the modified instrument (see Chapter IV for a more detailed explanation). Four subscales were identified as was expected, and the three additional Job Knowledge items all loaded positively on the JK subscale. Question 8 loaded poorly however (.38).

Job Performance

Job Performance and its two dimensions, Technical and Interpersonal (Motowidlo & Van Scotter, 1994), were assessed through a self-reported questionnaire measure developed for the purposes of this study. The 6-item instrument consists of three 2-item subscales: Overall Job Performance, Technical Job Performance, and Interpersonal Job Performance. Each of the six questions asked the respondent their degree of agreement on a 10-point Likert scale (1 = poor; 10 = very good) inquiring about their current perceived level of job performance. The Cronbach's alpha of the subscales were, .66, .71, and .71, respectively. The total instrument's reliability was .90.

Demographic Survey

A 9-question survey was used in this research. The first 5 questions assessed demographic data while the last 4 were concerned with job-related experience, job title, length of time on the job, and status entering the organization.

Rationale for Measures

Leherissey (1971, 1972) preferred the State and Trait distinction of curiosity because of the gain in conceptual clarity it afforded. Similarly, Boyle (1983) recommended the State and Trait Curiosity model for the sake of parsimony and its more global nature; pre-existing curiosity measures, he claimed, were unnecessarily specialized and therefore the distinction "would seem better suited for stimulating research experiments in the immediate future" (p. 383). Therefore, the State and Trait Curiosity model is well suited for further research and represents an excellent prospect for significant new insights into human curiosity.

State Curiosity is characterized by changes in arousal levels that are conflict-induced by a stimulus high in uncertainty and/or inadequate information. This situation motivates the search for additional information in order to allow for the reduction of this conflict and arousal, optimally resulting in exploratory behavior (Berlyne, 1960, 1965). In plainer terms, State Curiosity should be thought of as an individual difference in response to a particular curiosity-arousing situation (Naylor, 1981).

Day (1971) defined Trait Curiosity, conversely, as characteristic of individuals if they tend to become curious in more situations (specificity), more readily (reactivity), or

remained curious for longer periods of time (chronicity). Furthermore, according to Naylor (1981), individuals possessing higher levels of Trait Curiosity experience curiosity more intensely. Again, for the sake of clarity, Trait Curiosity should be thought of as an individual's capacity to experience a wider range of situations as curiosity-arousing than individuals possessing less curiosity.

Sensation Seeking has been most often associated with what Day (1971) described as "diversive curiosity." Diverisive curiosity, he posited, is characterized by heightened arousal, which in turn is induced by monotonous, invariable, and repetitive stimuli. Thus, the absence of stimuli may induce diverisive curiosity and ultimately exploratory behavior. Inasmuch as curiosity, in general, is important to the learning process (Berlyne, 1960; Day, 1972), and Sensation Seeking is related to curiosity (Boyle, 1983; Day, 1971; Giambra et al., 1992), a measure of Sensation Seeking should be included in any thorough research of the interrelationships between curiosity, socialization-related learning, and job performance.

With the Novelty Experiencing Scale, Pearson (1970) attempted to provide more comprehensive and representative coverage of the Novelty Seeking domain. It is an important scale due to its predictably strong correlation with the aforementioned SSS V scale (especially the ES and IS subscales) and its inclusion of two Cognitive subscales. It thereby more thoroughly represents the "relatively independent dispositions in the novelty domain" (Pearson, 1970, p. 204).

Curiosity may be related to socialization-related learning. It is important to remember curiosity is defined as a state of increased arousal response, promoted by a stimulus high in uncertainty and lacking in information, resulting in exploratory behavior and the search for information (Berlyne, 1965; 1966; Day et al., 1972). Consequently, these activities serve to enhance an individual's complex problem-solving ability (Tucker, 1986), ultimately leading to creative thought (Day, 1968). It can be argued an employee very frequently encounters situations where there is discrepant information or uncertainty; therefore, he or she needs to resolve the conflict or learning will not be expedited and the task cannot be satisfactorily performed. Berlyne (1960) reports conflict (induced by doubt, surprise, perplexity, bafflement, and contradiction), especially conceptual conflict, can be resolved by thinking, observing, and consulting or asking questions, which leads to the storage of knowledge and thus learning. The aforementioned conflict resolution techniques an individual employs are indeed related, therefore, to levels of socialization-related learning, as thinking, observing, asking questions, and thereby learning are necessarily a large part of

the information processing and socialization process (Ostroff & Kozlowski, 1992).

Although the Workplace Adaptation Questionnaire was developed primarily for new employees (0-24 months), it should also be appropriate for assessing the socialization-related learning of employees of any tenure. It is important to consider that employees often switch to different offices, branches and divisions of a business through promotions, have new bosses, etc., so the socialization-related learning process begins anew, despite years of incumbency at the organization (Schein, 1988). Moreover, the socialization-related learning that the instrument measures could be considered vital to all productive individuals in the organization, not just trainees or new employees.

Procedures

The instruments were all coded to assure confidentiality. Feedback will be provided after completion of the study by visiting the respective workplaces and reporting the findings to management.

The research measures and a one page background survey were administered in one 45-minute session. The administration of the research instruments were randomly ordered to control for possible transfer effects and familiarity.

Combination of the Sample

Kline (1993) and Tabachnick and Fidell (1989) recommended caution when pooling results from diverse groups for factor analytic work. Yet, the benefit is there would be an increase in sample size. According to Tabachnick and Fidell, if for example, "men and women produce the same factors, the samples should be combined and the results of the single FA [factor analysis] reported" (p. 602). After factor analyzing the four curiosity instruments and then the Workplace Adaptation Questionnaire, they were both analyzed according to gender and produced the same factors.

To further determine the feasibility of combining the four groups of this study, one-way ANOVAs (1 X 4) were performed on the independent and dependent variables of this study. There was no significant main effects for the Sensation Seeking Scale found between the variables. There was a significant main effect for the Workplace Adaptation Questionnaire ($F_{3, 229} = 4.54, p < .01$), Melbourne Curiosity Inventory ($F_{3, 229} = 5.12, p < .01$), and State-Trait Personality Inventory ($F_{3, 229} = 3.73, p < .05$), yet a Scheffe test (1% level of significance) for comparing means between the groups indicated no significant differences between the group means. There was a significant main effect for the Novelty Experiencing Scale ($F_{3, 229} = 11.03, p < .001$) and the Job

Performance ($F_{3, 229} = 20.72, p < .001$) instrument. For the Novelty Experiencing Scale, a Scheffe test indicated that groups 1 and 4 differed significantly. This may be explained by the difference in the two kinds of work groups, i.e., group 1 consists of lawn care personnel, while group 4 consists of computer service professionals. Apparently, the lawn care subjects of group 1 are simply not "Novelty Seekers." Groups 1 and 3, 1 and 4, and 2 and 3 all differed significantly on the Job Performance instrument. The lawn care companies (groups 1 and 2), reassuringly, did not differ on this measure. This may mean that since the self-reported Job Performance means were substantially higher in groups 3 and 4, perhaps these companies, with their higher salaries and education levels, have more confident employees.

The patterns of correlations between the background and independent and dependent variables were also examined. The patterns of correlation, while somewhat variable, followed the same general patterns between the four groups (e.g., low negative relationships between the Sensation Seeking Scale, the Workplace Adaptation Questionnaire (WAQ), and Job Performance by both male and females, for all four groups). The only background variable that varied somewhat between the four groups was the age variable. Age and the WAQ were only correlated significantly in group 1, while age and Job Performance were significantly related in both groups 1 and 2. Perhaps the lower age levels and relative inexperience of the subjects in these two groups, especially group 1 (group 1 = 23.4; 2 = 30.0; 3 = 23.9; and 34.5 years of age, respectively) plus the nature of their jobs, i.e., lawn care, account for these noted differences.

On the basis of the fairly consistent patterns of correlations, the lack of a significant difference between the groups on most of the main variables of interest (one-way ANOVAs), and the consistent factor structure by gender on the independent variables, it was decided it would be appropriate to combine the individuals of this study into one large sample. Nevertheless, the results of this study would best be applied cautiously to similar research populations only.

Data Analysis

Macintosh computer version 4.0 of the Statview statistical software, by Abacus, was utilized for most of the data analysis. A codebook was developed in order to expedite coding of the curiosity, learning, and job performance instruments. The raw data were entered on the spreadsheet package Excel 4.0 for the Macintosh, saved in a text format, and then imported into a Statview 4.0 data file in order to facilitate the necessary statistical procedures required for this research. In addition, EQS 5.4 for Windows was used to ascertain the standardized partial path coefficients for the paths between theorized independent and

dependent variables in the various *a priori* determined path models.

The data was double-checked for accurate input and was subsequently screened by calculating univariate descriptive statistics. The descriptive statistical results were carefully scrutinized for skewness and kurtosis, outliers, variance, and meaningful standard deviations. Suspicious values were checked against the data for input errors, and corrected where applicable. Lastly, bivariate scatter plots were run for the continuous variables to ascertain the degree of linear relationships.

Outliers were investigated to determine how they were different from the population. Possible outliers were first evaluated visually on scatter plots; the Mahalanobis distance for evaluating multivariate outliers was computed as well. Because in all analyses the number of outliers never exceeded 2% of the total sample of 233 subjects, no outliers were excluded in this study as recommended by Cohen and Cohen (1983).

Qualitative variables were treated as if they were a nominal scale and dummy coded, as appropriate, according to the recommendations of Cohen & Cohen (1983).

The background data was represented by descriptive statistics such as frequency distributions, means, variances, and standard deviations. Reliability of the measurement scales were determined by calculating Cronbach's alpha; a mean scale score and a mean subscale score was calculated for each participant in the study.

Answering the Research Questions

To answer the three research questions, a logical progression was followed, i.e., Pearson's *r* correlations were determined for first the Total Scales and then the subscales of interest in this study (and examined for meaningful relationships). Next, for research questions one and two, curiosity factor scores were also used for predictive purposes. Question three used the correlations between the variables of interest (and standard deviations) for determining standardized path coefficients and causal relationships between the independent and dependent variables.

In an effort to answer the first research question, "What is the relationship of selected measures of curiosity to socialization-related learning?", Pearson *r* correlations were computed for the continuous variables in order to determine the extent of the relationship between curiosity and socialization-related learning. A Principal Components Analysis (PCA) extraction with varimax rotation was employed on the four curiosity measures to obtain a parsimonious number of curiosity factors, and to obtain factor scores (estimates of the scores

participants in the study would have received on each of the factors had they been measured directly) for predictive purposes. The two curiosity factors were also correlated with the various socialization-related learning variables.

In answering research question two, "What is the relationship of selected measures of curiosity to different facets of job performance?", the same procedures as in question one were followed. The two curiosity factors were correlated (Pearson r) in an effort to ascertain the magnitude of the interrelationships between the various curiosity and job performance factors. Moreover, the derived factor scores were also utilized for predicting the various aspects of the job performance proposed in this research.

In research question three, "What is the extent of the possible mediating effect of socialization-related learning among the *a priori* determined variables: curiosity and job performance?" (i.e., To what extent does socialization-related learning mediate the relationship between curiosity and job performance?), the correlations between the continuous variables and their standard deviations were used to calculate standardized path coefficients for inclusion in several *a priori* determined theoretical models.

Thus, intercausal connections thought to exist on a *priori* grounds were quantitatively assessed through computing the standardized path coefficients (as determined by the literature: curiosity, socialization-related learning, and job performance). Wolfle (1980) informs us in recursive equation path-analytic models (like the ones in this study), all variables besides the ultimate independent variable are ordered causally with respect to each other, thereby allowing for the determination of direct causal links between the variables, as well as the extent to which intervening (mediating) variables account for relationships among the *a priori* determined and subsequent variables. This technique thus allowed for examining the hypothesized mediating effect of socialization-related learning between curiosity and job performance.

Chapter Summary

Chapter III included a description of the subjects, the instrumentation, a rationale for using the research measures and combining the four groups into one research sample, the procedures, and the data analyses. Chapter IV will present the results of this study and the conclusions and recommendations for future research are brought forward in Chapter V.

CHAPTER IV

RESULTS

This research was an exploratory investigation of the interrelationships between curiosity, socialization-related learning, and job performance in a combined sample of four companies in the service industry. In this chapter the population and sample were described, and responses were provided for the issues in each of the three research questions. The Statview 4.0 statistical package for the Macintosh was used for all analyses except for determining standardized path coefficients (EQS 5.4 for Windows was used for these analyses). Appropriate data presentation and discussion of the results will also be included.

Description of the Sample

Companies. The combined sample consisted of individuals from four service companies: two chemical lawn and tree care companies, a large computer consulting company, and a small printing company.

One lawn and tree care company, of Gaithersburg, MD (a suburb of Washington, DC), is a locally owned and operated lawn and tree service company generally employing 60 employees (these results were accumulated over a two year period, thus indicating a high turnover rate during this time). At the time of this study, it had been in business for 25 years and was widely known overall as one of the premier companies in the chemical lawncare industry.

The second lawn and tree care company is owned and operated in Souderton, PA. The company has many separate divisions (16), diversely ranging from fuel oil delivery and wholesale bird seed distribution, to liquid fertilizer production and lawn and tree care services. The participants in this study came from their lawn and tree care service group, which employs 25 full-time individuals.

The computer consulting company, participating under the condition of anonymity, is a world-wide, Fortune 100 company offering the latest in computer services and information technology. The division participating in this study is located in Falls Church, VA, another suburb of Washington, DC. It has a work force of 70 permanent employees.

The printing company is located in Washington, DC and has 21 full-time employees. Their primary work is to produce and distribute newsletters for the health-care service industry. It is

locally owned and operated, and participated under the condition of anonymity as well.

Subjects. The descriptive statistics for the personal demographic variables are shown in Table 4.1. The sample's mean age was 32.5, almost half of the sample (48 percent) was less than 30, and the bulk of the sample was under the age of 40 (74 percent). Males comprised roughly 65 percent of the subjects in this study. A majority (86 percent) of the participants were Caucasian, 9 percent African-American, 3 percent Hispanic, and slightly more than 1 percent Asian. Consequently, a typical subject in this study was a Caucasian male under the age of 39.

The descriptive statistics for the job-related demographics are shown in Table 4.2.

Almost 64 percent of the subjects earned less than \$30,000 per year (27 percent of the sample earned less than \$20,000 annually and 36 percent earned between \$20,000 and \$30,000). Only 22 percent of the participants earned more than \$40,000 per year.

Nearly one third of the sample had a four-year college education or more, with 10 percent possessing an advanced degree. Thirty percent of the participants had some college background, but not a degree, while approximately 37 percent of the participants reported having a high school diploma or less. Consequently, approaching 62 percent of the sample had at least some college background.

Over 90% of the sample came to their current job position from outside the organization. Finally, almost 38 percent of the sample had less than 1 year of prior work experience, and 46 percent had less than two; 37 percent, interestingly, had between four and five years of experience. The typical participant in this study was thus a less than 40 year old, male Caucasian, with at least some college, coming from outside the company, making less than \$30,000 per year, and possessed less than two years of job-related experience.

Although there were many different job titles, all participants could be placed into three broad categories for the purpose of this study: Managers, service workers, and administrative aides. Managers (individuals whose primary responsibility is to supervise other employees in order to attain organizational objectives) comprised 15 percent of the sample, service workers (individuals who actually provide the "real" service an organization has to offer, in direct day-to-day contact with internal and external customers, with no supervisory requirements) 70 percent, and administrative aides (individuals whose primary responsibilities are to assure smooth interoffice

Table 4.1

Personal
Demographics
(N=233)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>N</u>	<u>%</u>
Age						
<21	25	1	1	8	35	15.02
21-29	54	7	11	5	77	33.05
30-39	26	9	20	5	60	25.75
40-49	9	8	30	1	48	20.60
50-59	3	0	7	2	12	5.15
60-69	0	0	1	0	1	0.43
<u>Total</u>	117	25	70	21	233	100.00
Gender						
Male	100	24	21	7	152	65.24
Female	17	1	49	14	81	34.76
<u>Total</u>	117	25	70	21	233	100.00
Race						
Asian	0	0	1	2	3	1.29
African-American	13	0	7	3	23	9.87
Hispanic	4	0	1	2	7	3.00
Caucasian	100	25	61	14	200	85.84
Other	0	0	0	0	0	0.00
<u>Total</u>	117	25	70	21	233	100.00

1 = Lawn and Tree Care Service Company 1

2 = Lawn and Tree Care Service Company 2

3 = Computer Service Company

4 = Printing Service Company

Table 4.2**Job-Related Demographics (N=233)**

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>N</u>	<u>%</u>
Salary						
<\$20,000	50	4	3	8	65	27.90
\$20,000-30,000	54	13	11	6	84	36.05
\$30,001-40,000	7	4	16	4	31	13.31
\$40,001-50,000	2	3	16	3	24	10.30
>\$50,000	4	1	24	0	29	12.45
Total	117	25	70	21	233	100.00
Education						
< High School	12	1	0	2	15	6.44
High School	51	10	3	7	71	30.47
Some College	41	8	17	5	71	30.47
BS Degree	10	6	17	4	37	15.88
Some Grad School	2	0	12	1	15	6.44
Master's	1	0	15	1	17	7.30
Doctoral	0	0	6	1	7	3.00
Total	117	25	70	21	233	100.00
Status						
New (to company)	111	24	60	15	210	90.13
Transferred	2	1	6	3	11	4.72
Promoted	4	0	4	3	12	5.15
Total	117	25	70	21	233	100.00
Experience						
< 1 year	58	13	5	12	88	37.77
> 1 < 2 years	12	1	6	1	20	8.58
> 2 < 3 years	8	1	4	1	14	6.01
> 3 < 4 years	11	2	6	1	20	8.58
> 4 < 5 years	27	8	46	6	87	37.34
> 5 years	1	0	3	0	4	1.72
Total	117	25	70	21	233	100.00

1 = Lawn and Tree Care Service Company 1

2 = Lawn and Tree Care Service Company 2

3 = Computer Service Company

4 = Printing Service Company

paper flow, and to field and direct customer inquiries) 15 percent. A more detailed demographic profile appears in Appendix A.

Background Variable Intercorrelations

For the combined sample, either point biserial, phi, or rank correlations were calculated as necessary between the background variables (the personal and job-related demographics) and they appear in Table 4.3. The patterns of correlations were investigated to see if the interrelationships were logical and in the expected directions (e.g., it was expected that education and salary would be positively and moderately related, which they were).

Although the relationship between age and gender was somewhat weak (with $p < .01$), the relationships between age and salary, education, and experience were predictably positive, moderate, and significant. Only status entering one's current position and race were not significantly related to age in the total sample ($p > .07$).

All of gender's interrelationships with the other background variables were fairly weak to almost nonexistent. Age, salary, education, and experience all had positive, statistically significant ($p < .01$) relationships with gender. On the other hand, gender had a nonsignificant relationship with status.

Predictably, salary had a significant and reasonably strong positive relationship ($p < .01$) with education and experience, and as previously mentioned, a somewhat weak positive relationship with gender. Status was once again nonsignificant statistically (this time with salary).

Level of education had a moderate positive relationship with experience, salary, and age ($p < .01$). There was a nonsignificant relationship between education and status ($p > .72$). Lastly, experience was the only background variable with a significant relationship with status ($p < .05$).

Curiosity Measures

From the number of curiosity measures reported in the literature, four scales were selected that best represented the psychological construct in adults. Paper-and-pencil, self-report questionnaire measures were utilized as recommended by Ainley (1987) and Langevin (1971) to afford conceptual clarity.

The scales were as follows: Sensation Seeking Scale (SSS; Zuckerman, 1979); Novelty Experiencing Scale (NES; Pearson, 1970); State-Trait Personality Inventory (STPI; Spielberger, et al.,

Table 4.3

Intercorrelations Between Background Variables (N = 233)

	<u>Age</u>	<u>Gender</u>	<u>Salary</u>	<u>Educ</u>	<u>Exper</u>	<u>Status</u>
Age	----					
Gender	.24	----				
Salary	.62	.23	----			
Education	.52	.21	.65	----		
Experience	.50	.23	.45	.32	----	
Status	.09	.12	.06	.02	*.15	----

Note. * = Statistically significant with $p < .05$.

All relationships represented by bold print were significant at the $p < .01$ level.

Educ = highest level of education achieved in school.

Exper = amount of time in current position.

1980); and the Melbourne Curiosity Inventory (MCI; Naylor, 1981). This group of curiosity scales provided 12 subscales with reliabilities ranging from .48-.94 (see Table 4.4).

Descriptive Statistics for Curiosity Subscales. The descriptive statistics for the curiosity subscale scores are shown in Table 4.5. While it is difficult to draw any substantive conclusions regarding the average scale scores, it should be noted that the present scale means were fairly comparable with those of other studies (e.g., Naylor, 1981; Olson, Camp, & Fuller, 1984).

In the Olson, Camp, and Fuller (1984) study, the means for the college student participants on the Trait and State subscales of the MCI were 56.6 and 51.9 (out of a possible score of 80 for each subscale), respectively. Naylor (1981), with a group of largely 10th through 12th graders, had Trait and State scores on the MCI of 56.1 and 58.1. These scores are in contrast to this study's adult sample curiosity scores of 60.8 and 58.5, respectively. Thus, this study's subjects had slightly higher trait curiosity levels than both other research studies, and higher state curiosity than the college student sample. Curiosity scores on the STPI (maximum possible score of 40 on each subscale) and SSS (maximum possible score of 10 on each of the four subscales) were not substantially different between this study and the Olson, Camp, and Fuller study.

Overall, this study's curiosity subscale means are comparable to previous research which lends further support for combining the four groups into one sample for the purposes of this research. Even between the four service-industry groups there were few appreciable differences in the means (as determined by one-way ANOVAs). Guided by previous research with the curiosity instruments, then, this sample's averages were essentially within prior expectations and thus it may be plausible that this study's results could be cautiously compared to similar research.

Interscale Correlations. Interscale correlations of the twelve curiosity subscale scores are shown in Table 4.6. As expected, due to their global nature, the patterns of relationships of the STPI and MCI subscales were very similar between all of the other instruments in this study. The correlation, however, between the subscales of the two instruments themselves were only moderately correlated, indicating the two instruments are measuring somewhat different kinds of curiosity. The MCI and STPI subscales were most significantly related to the Cognitive Subscales of the NES, while the State subscale of the MCI was the only one significantly related to any of the SSS subscales (although negatively). All of the observed relationships were as would be expected from previous research.

Table 4.4Curiosity Subscale Reliabilities (N = 233)

<u>Scale</u>	<u>Cronbach's alpha</u>
MCI-State	.94
MCI-Trait	.92
NES-External Sensation	.85
NES-Internal Cognitive	.90
NES-Internal Sensitive	.83
NES-External Cognitive	.83
STPI-State	.79
STPI-Trait	.80
SSS-Disinhibition	.67
SSS-Boredom Susceptibility	.60
SSS-Thrill and Adventure Seeking	.76
SSS-Experience Seeking	.48

MCI = Melbourne Curiosity Inventory
NES = Novelty Experiencing Scale
STPI = State-Trait Curiosity Inventory
SSS = Sensation Seeking Scale

Table 4.5Curiosity Subscale Descriptive Statistics (N = 233)

	Mean	Standard Deviation	Median
MCI-S	58.5	11.5	60.0
MCI-T	60.8	10.0	61.0
NES-ES	11.9	4.8	12.0
NES-IC	13.3	5.4	14.0
NES-IS	10.9	4.5	11.0
NES-EC	11.0	4.7	11.0
STPI-S	27.4	5.1	27.0
STPI-T	28.1	5.1	28.0
SSS-DS	4.5	2.4	5.9
SSS-BS	3.4	2.2	4.8
SSS-TS	6.2	2.7	7.2
SSS-ES	5.2	1.9	3.7

MCI-S = Melbourne Curiosity Inventory-State

MCI-T = Melbourne Curiosity Inventory-Trait

NES-ES = Novelty Experiencing Scale-External Sensation

NES-IC = Novelty Experiencing Scale-Internal Cognitive

NES-IS = Novelty Experiencing Scale-Internal Sensation

NES-EC = Novelty Experiencing Scale-External Cognitive

STPI-S = State-Trait Personality Inventory-State

STPI-T = State-Trait Personality Inventory-Trait

SSS-DS = Sensation Seeking Scale-Disinhibition

SSS-BS = Sensation Seeking Scale-Boredom Susceptibility

SSS-TS = Sensation Seeking Scale-Thrill and Adventure Seeking

SSS-ES = Sensation Seeking Scale- Experience Seeking

Table 4.6Curiosity Interscale Correlations (N = 233)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
1.MCI-S	--	79	-03	42	15
2.MCI-T	--	--	04	44	18
3.NES-ES	--	--	--	04	26
4.NES-IC	--	--	--	--	48
5.NES.IS	--	--	--	--	--
6.NES-EC	--	--	--	--	--
7.STPI-S	--	--	--	--	--
8.STPI-T	--	--	--	--	--
9.SSS-DS	--	--	--	--	--
10.SSS-BS	--	--	--	--	--
11.SSS.TS	--	--	--	--	--
<u>12.SSS-ES</u>	--	--	--	--	--

Table 4.6 (continued)Curiosity Interscale Correlations (N = 233)

	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
1.MCI-S	29	51	50	-14	-12
2.MCI-T	38	56	58	00	-02
3.NES-ES	29	06	-01	25	07
4.NES-IC	62	32	36	-25	-23
5.NES.IS	29	08	09	09	05
6.NES-EC	--	32	30	-13	-14
7.STPI-S	--	--	78	-12	-06
8.STPI-T	--	--	--	-15	-07
9.SSS-DS	--	--	--	--	51
10.SSS-BS	--	--	--	--	--
11.SSS.TS	--	--	--	--	--
<u>12.SSS-ES</u>	--	--	--	--	--

Table 4.6 (continued)

Curiosity Interscale Correlations (N = 233)

	<u>11</u>	<u>12</u>
1.MCI-S	04	01
2.MCI-T	07	05
3.NES-ES	69	12
4.NES-IC	03	16
5.NES-IS	15	32
6.NES-EC	20	18
7.STPI-S	04	10
8.STPI-T	-01	12
9.SSS-DS	18	19
10.SSS-BS	03	31
11.SSS.TS	--	15
<u>12.SSS-ES</u>	<u>--</u>	<u>--</u>

Note. Decimal points for correlations were not included.
All correlations greater than $\pm .19$, $p < .001$.
Correlations $\leq \pm .13$ were not significantly significant.

MCI-S = Melbourne Curiosity Inventory-State
MCI-T = Melbourne Curiosity Inventory-Trait
NES-ES = Novelty Experiencing Scale-External Sensation
NES-IC = Novelty Experiencing Scale-Internal Cognitive
NES-IS = Novelty Experiencing Scale-Internal Sensation
NES-EC = Novelty Experiencing Scale-External Cognitive
STPI-S = State-Trait Personality Inventory-State
STPI-T = State-Trait Personality Inventory-Trait
SSS-DS = Sensation Seeking Scale-Disinhibition
SSS-BS = Sensation Seeking Scale-Boredom Susceptibility
SSS-TS = Sensation Seeking Scale-Thrill and Adventure Seeking
SSS-ES = Sensation Seeking Scale- Experience Seeking

The Sensation subscales of the NES were, as would be predicted, most closely related to the SSS's subscales. In particular, there was a strong relationship between the External Sensation subscale of the NES and the Thrill and Adventure Seeking subscale of the SSS. This is appropriate as both subscales' questions concern physical-sensation seeking. The Cognitive subscales of the NES were both negatively and significantly related to the Disinhibition and Boredom Susceptibility SSS subscales. Interestingly, the Internal Cognitive NES subscale had a positive and significant correlation with the Experience Seeking SSS subscale, while the External Cognitive subscale was significantly related to both the Thrill and Adventure Seeking and Experience Seeking subscales. These relationships may indicate the Cognitive NES subscales have a partial sensation-seeking component, especially since neither the STPI nor the MCI, arguably cognitive curiosity measures, had a similar relationship. Lastly, the Internal Cognitive and Sensation subscales had a moderate relationship; therefore, conceptual clarity between the two would seem to be limited (one-way ANOVAs indicated that there was a significant difference between the four groups of this study on the Internal and External Cognitive subscales of the NES which may, in part, account for the ambiguity. Nevertheless, Ainley [1987] reported this same lack of clarity).

The Disinhibition and Experience Seeking subscales of the SSS were positively and significantly related to the Thrill and Adventure Seeking and Boredom Susceptibility subscales. In addition, there was a moderate positive correlation between the Boredom Susceptibility and Disinhibition subscales as well, indicating they may be measuring much of the same thing.

Factor Analysis. Initially, the Principal Components Analysis (PCA) factor extraction method was performed on all variable scores of the 12 subscales based on the matrix of their Pearson product-moment correlations ($N = 233$). Using the Kaiser Criterion, where all factors with eigenvalues greater than one are retained and usually rotated for the final solution, only four of the five factors were extracted.

As a general rule of thumb, after a PCA, an acceptable number of eigenvalues greater than one should be between the number of variables divided by five and the number of variables divided by three (Tabachnick and Fidell, 1989). Since there were 12 variables, one would predict having between two and four factors, and there were four.

The eigenvalues of the four identified factors were 3.63, 2.18, 1.51, and 1.25, accounting for 30.3%, 18.2%, 12.6%, and 10.4% of the total variance, respectively. Consequently, 71.5 percent of the total variance was explained by the four extracted

factors. A three-factor solution, too, was examined as recommended by Boyle (1989) and Byman (1993). The three factors accounted for 61.1% of the total variance.

Other factor-analytic research on similar self-reported, questionnaire measures of curiosity (e.g. Ainley, 1987; Langevin, 1971) claimed, in the interest of clarity and parsimony, that two curiosity factors would be sufficient to describe the curiosity construct. Cohen and Cohen (1983) would seem to agree with this "less is more" approach, as this approach assures "more statistical test validity, more power, and more clarity in the meaning of the results" (p. 171). Recognizing that the Kaiser Criterion may over- or underestimate the number of factors (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989), a scree test was used as a second criterion. Two factors were comfortably identified by this method. With this in mind, a two-factor solution was examined as well and the total variance explained was 48.5%.

Once the set of two, three, and four factors were extracted from the correlation matrix by the PCA, they were rotated to increase interpretability of the factor solution. Thus, to increase the ease of interpreting, describing, and reporting the results, a varimax rotation (orthogonal) was performed, as recommended by Tabachnick and Fidell (1989). The results of the varimax rotations are located in Table 4.7.

Careful examination of the two-, three-, and four-factor solutions yielded interesting results. With the four-factor solution, both of the State and Trait measures of the MCI and STPI loaded on Factor 1. This reflects the moderate to high correlations among the MCI and STPI subscales. Only two curiosity subscales loaded on Factor 2 (NES-ES and SSS-TS) indicating that it may be an unstable factor and should be viewed with caution (Tabachnick & Fidell, 1989). On Factor 3, only the SSS-BS and SSS-DS subscales loaded clearly, while the SSS-ES loaded ambiguously on both Factors 3 and 4. This may mirror the SSS-ES' poor reliability (.48). The NES-IS, -IC, -EC all loaded cleanly on Factor 4, yet the SSS-ES loaded on it ambiguously. The External Cognitive subscale of the NES loaded on all but Factor 2. In addition, the Internal Cognitive subscale of the NES loaded somewhat ambiguously on both Factors 1 and 4, while the Experience Seeking subscale of the SSS loaded on Factors 3 and 4. Due to Factors 2 and 3 having only 2 clear subscales loading on them each, and a number of cross-loadings (only one was serious though), the four-factor model seemed at least somewhat suspect.

A three-factor solution, although strongly supported in the literature by Boyle (1983) and Byman (1993), was unclear as well, as the Experience Seeking subscale of the SSS loaded ambiguously on both Factors 2 ("Venturesomeness" as recommended by Byman) and

Table 4.7Varimax Rotation of Two, Three, and Four Curiosity Factors:Curiosity Subscales

Scale	Four-Factor Solution				Three-Factor Solution			Two-Factor Solution	
	1	2	3	4	1	2	3	1	2
MCI-T	85	05	02	16	85	11	04	81	04
STPI-T	84	-04	-02	08	84	-01	-01	77	-09
STPI-S	84	04	-01	05	82	03	02	76	-03
MCI-S	80	00	-10	13	80	04	-09	78	-08
NES-ES	-02	90	11	14	-11	79	18	07	76
SSS-TS	02	90	07	06	-09	74	15	08	69
SSS-BS	-03	-04	86	-02	-01	-03	84	-23	46
SSS-DS	-08	24	77	-09	-12	15	79	-27	59
NES-IS	01	13	13	79	79	60	02	33	48
NES-IC	37	-02	-30	75	75	54	-40	72	08
NES-EC	34	34	-24	60	43	58	-28	63	28
SSS-ES	02	-01	53	55	16	35	43	13	52

Note. Decimal points excluded.

Factor loadings $\geq .30$ are significant.

Four-factor solution accounts for 71.5% of the total variance.

Three-factor solution accounts for 61.1% of the total variance.

Two-factor solution accounts for 48.5% of the total variance.

MCI-S = Melbourne Curiosity Inventory-State

MCI-T = Melbourne Curiosity Inventory-Trait

NES-ES = Novelty Experiencing Scale-External Sensation

NES-IC = Novelty Experiencing Scale-Internal Cognitive

NES-IS = Novelty Experiencing Scale-Internal Sensation

NES-EC = Novelty Experiencing Scale-External Cognitive

STPI-S = State-Trait Personality Inventory-State

STPI-T = State-Trait Personality Inventory-Trait

SSS-DS = Sensation Seeking Scale-Disinhibition

SSS-BS = Sensation Seeking Scale-Boredom Susceptibility

SSS-TS = Sensation Seeking Scale-Thrill and Adventure

SSS-ES = Sensation Seeking Scale-Experience Seeking

3 ("Experience Seeking" as recommended by Olson & Camp [1984]). Moreover, both the Internal and External Cognitive subscales of the NES loaded ambiguously on Factors 1 ("Cognitive Curiosity") and 2. Even while the three-factor curiosity model in this study accounted for 5.6 percent more of the variance than Ainley's (1987) initially-examined three-factor solution, investigating a two-factor solution still seemed prudent.

In the two-factor model, all but one of the loadings of the SSS subscales and the NES' Sensation subscales loaded clearly on Factor 2. The second factor closely resembled Ainley's (1987) "breadth-of-interest" curiosity factor and because of its sensation seeking nature, this factor will be called "Sensation Seeking" in this research. Factor 1 had reasonably unambiguous loadings from the NES' Cognitive subscales, and the State and Trait subscales of both the MCI and STPI as well. The first curiosity factor very closely resembled Ainley's "depth-of-interest" curiosity scale and because of its cognitive nature, this factor will be called "Cognitive Curiosity," as first proposed by Malone (1981), for the purposes of this study.

Upon examining the factor structures for gender differences, all of the subscales loaded similarly for both genders. Thus, the two-factor solution was stable for both genders.

Curiosity Factor Scores

Using factor scores from each of the four rotated factors in a regression model proved helpful. The two-, three-, and four- (orthogonal) factor scores were put into three respective regression models as independent variables (with socialization-related learning as the dependent variable). Four curiosity predictors accounted for 24.5 percent of the total variance of the first model. When utilizing the two curiosity predictors from the two-factor solution, there was an R^2 of .236 (the three curiosity predictor model yielded an identical R^2 of .236). Thus, utilizing four factor scores yielded a scant .9 percent increase in explaining the variance of the regression model, whereas three factor scores provided no extra explanation of the model's variance. The two curiosity factors seemed to therefore have the best research utility.

Rationale for Two-Factor Curiosity Solution

In the four-factor curiosity solution, two of the factors had but two significant loadings which indicated factor instability and need for extreme caution in interpreting the results (Tabachnick & Fidell [1989] recommended it may be best to ignore this type of factor because "one never knows if such factors are 'real'", p. 605). In the three-factor solution, there were also a number of significant cross-loadings (4) among the variables as well (especially between Factors 1 and 2). Consequently, based on

the results of using the curiosity factor scores in regression models for predictive purposes, the scree test, and prior research which favored the parsimony of the two-factor model (e.g., Ainley, 1987), a two-factor solution seemed most appropriate for the purposes of this research. Yet, are these results conceptually sound?

Malone (1981) claimed that curiosity could be best thought of as being separated into cognitive and sensory components, which the two-factor solution from this study clearly does. Langevin (1976) and Ainley's (1987) research supports this interpretation of the curiosity construct as well. While the four-factor solution indicated that curiosity could be thought of as "Cognitive Curiosity," "Venturesomeness," "Experience Seeking," and "Novelty Seeking," respectively, more research would be needed to determine whether the Venturesomeness and Experiencing Seeking factors are truly unique factors. Intuitively, the difference between the two factors is quite minor as they both encompass the orientation to experience change and variation, despite social or physical risks.

In the three-factor solution, all of the NES' subscales loaded on both the Venturesomeness and Cognitive factors suggesting that the Venturesomeness factor may not be a stable one. This is contrary to the interpretation of Byman (1993) who re-analyzed Ainley's (1987) original data and claimed there was a need to include the Venturesomeness- curiosity factor to fully understand the curiosity construct; yet, it is clear Ainley's data only called for a two-factor interpretation as the third factor in her analysis had but two significant loadings. In this study, the Venturesomeness factor is not consistent between the four- and three-factor solution. However, the Experiencing Seeking factor is consistent between both and also carries into the two-factor solution where it is called Sensation Seeking.

While it is acknowledged that the four- and three-factor interpretations may have some merit, there is a lack of sufficient empirical evidence to fully support them. The lack of conceptual clarity in both solutions is also a concern. Thus, for the purposes of this study, a two-factor curiosity solution was deemed to be most appropriate.

Examination of the Workplace Adaptation Questionnaire

Morton (1993) developed the Workplace Adaptation Questionnaire in an effort to look at the different salient dimensions of socialization-related learning in the workplace. The instrument is a self-reported, 19-item questionnaire measure with four subscales: Job Knowledge (JK), Acculturation (AC), Establishing Relationships (ER), and Satisfaction with Learning Experiences (SLS).

In an attempt to add further reliability and balance to the JK subscale, three remaining questions with the highest factor loadings from the Morton (1993) study were added to the instrument. With a sample of employees from four organizations in the service industry, the reliabilities of the JK, AC, ER, SLS subscales were .96, .86, .85, and .81, respectively.

Means and standard deviations of the items and scale scores of the WAQ are located in Table 4.8. The means and standard deviations of each subscale item were only slightly higher than in the Morton (1993) study and the differences were not considered meaningful. Perhaps this study's higher means were simply a function of the kind of samples employed by the respective studies, e.g., this study employed both newcomers and "old-timers," as Schein (1988) proposed, while Morton's sample was comprised of only newcomers to study socialization-related learning.

Factor Analysis of the Workplace Adaptation Questionnaire (WAQ)

A PCA was performed on all 22 item scores of the WAQ based on the matrix of their item Pearson-product moment correlations. The matrix of Pearson product-moment item correlations is located in Appendix B. As with the aforementioned curiosity measures, all factors with eigenvalues greater than one were retained for rotation (the eigenvalues were 6.9, 2.7, 2.4, and 1.4, respectively). Thus, only four of the eight extracted factors were retained, accounting respectively for 31.3 percent, 12.5 percent, 10.7 percent, and 6.5 percent of the total variance. A scree test was then used as a second criterion and four clear factors were again identified as well.

To increase interpretability of the extracted factors, ultimately, an oblique rotation was performed. On the Statview 4.0 for Macintosh statistical package, all factor analyses are initiated by selecting an extraction method (in this case a PCA), and then transformed according to your choice (Varimax for this case). Automatically, Statview applies an additional transformation--the orthotran transformation--to the previously selected orthogonal transformation you choose to make the underlying structure clearer. This is accomplished by relaxing the requirement that the factors remain uncorrelated. As stated in the Statview procedure manual, "When the orthotran procedure does perform an additional transformation, the resulting factor pattern is said to be oblique, i.e., the other factors are not uncorrelated with each other" (p. 362). For the purposes of this study, then, the oblique-factor solution was used. The results are located in Table 4.9. With only one exception, items loaded clearly on their subscale factor, but note that JK8 loaded poorly on Factor 1. The AC items all loaded clearly on the AC

Table 4.8Workplace Adaptation Questionnaire (WAQ) Descriptive Statistics

	<u>Mean</u>	<u>Standard Deviation</u>
JK1	4.25	.79
JK2	4.29	.75
JK3	4.41	.70
JK4	4.18	.72
JK5	4.17	.75
JK6	4.10	.78
JK7	3.81	.94
JK8	4.09	.79
JK Total Scale	33.28	4.41
AC9	3.79	.89
AC10	3.69	.97
AC11	3.70	.91
AC12	4.06	.79
AC13	3.85	.81
AC Total Scale	19.00	3.54
ER14	4.34	.75
ER15	4.21	.74
ER16	4.33	.68
ER17	4.14	.81
ER18	4.23	.84
ER Total Scale	21.25	3.02
SLS19	3.75	.97
SLS20	3.91	.84
SLS21	4.03	.81
SLS22	3.68	1.05
SLS Total Scale	15.38	2.94
WAQ Total Scale	56.31	7.00

Note. N = 233.

JK = Job Knowledge

AC = Acculturation

ER = Establishing Relationships

SLS = Satisfaction With Learning Experiences

Table 4.9

Varimax Rotation of the WAQ (N = 233)

Four-Factor Oblique Solution

Factor	1	2	3	4
JK1	76	08	00	-15
JK2	75	07	04	00
JK3	70	03	17	-08
JK4	69	-18	02	13
JK5	78	-03	-01	-08
JK6	68	09	14	05
JK7	65	-11	03	13
JK8	38	26	23	15
AC9	-02	-03	01	83
AC10	-04	07	01	85
AC11	-05	19	03	73
AC12	14	05	00	70
AC13	27	-15	35	45
ER14	-02	06	82	-04
ER15	13	00	81	-09
ER16	04	-06	81	01
ER17	-02	02	83	00
ER18	-03	08	62	14
SLS19	-17	81	19	-01
SLS20	03	86	-06	-07
SLS21	09	79	-14	07
SLS22	00	70	08	11

Note. Decimal points are excluded.

Factor loadings $\geq .30$ are significant loadings.

Four-factor solution accounts for 61.0% of the total variance.

JK = Job Knowledge

AC = Acculturation

ER = Establishing Relationships

SLS = Satisfaction with Learning Experiences

subscale, except for the fifth item, which also loaded on the ER subscale. Upon examining the question ("I know the informal rules, policies, and procedures of my organization."), perhaps the term "informal" was misinterpreted by the study's participants. Instead of the term informal, "general" or "unwritten" could have been more precise. Although the item in question loaded somewhat unclearly, it was retained in this study to facilitate comparison with previous research.

Furthering the factor analysis by gender yielded almost identical results. The male sample's ($n = 152$) loadings were the same as for the entire combined sample, whereas the female sample's loadings ($n = 82$) were only slightly different. The eighth question of the JK subscale loaded ambiguously on both the ER and SLS subscales ("I know what resources are available to help me do my job."). Unlike with the male sample, there was a moderately high loading on the "informal rules" question of the AC subscale.

In conclusion, even with a different kind of research sample than the Morton (1993) study (i.e., service-industry workers vs. government workers), the acceptable subscale internal consistencies and the results of the subscale factor analyses indicated that the WAQ would be an appropriate research instrument for the purpose of examining socialization-related learning in the workplace.

Exploring the Socialization-Related Learning and Curiosity Relationship

This section of Chapter IV will deal with the first research question, "What is the relationship of selected measures of curiosity to socialization-related learning?"

Total Scale Intercorrelations. The intercorrelations between the Total Scales of the four curiosity measures of this study (i.e., the MCI, STPI, NES, and SSS) and the Total Scale of the socialization-related learning measure (i.e., the WAQ) are presented in Table 4.10.

The relationships between all of the curiosity measures and the WAQ were statistically significant with $p < .02$ in all cases. Predictably, the MCI and the STPI Total Scales (Cognitive Curiosity scales) had similar positive relationships to the WAQ Total Scale (.40 and .33, respectively) as they both were designed to measure State and Trait curiosity (not to mention that they were essentially a single factor). The NES Total Scale (comprised of a combination of two Sensation and two Cognitive Curiosity subscales each) had a rather low positive relationship with the WAQ (.21); yet, it was still statistically significant at the $p < .02$ level. Appropriately, the SSS Total Scale had the only

Table 4.10

Intercorrelations Between Curiosity and Socialization-Related Learning Total Scales (N = 233)

	MCI-T	NES-T	STPI-T	SSS-T	WAQ-T*
MCI-T	---	.36	.60	-.02	.40
NES-T		---	.29	.21	.16*
STPI-T			---	-.04	.33
SSS-T				---	-.20
WAQ-T					---

Note. Bold numbers ($p < .001$); * = $p < .02$
MCI-T = Melbourne Curiosity Inventory-Total
NES-T = Novelty Experiencing Scale-Total
STPI-T = State-Trait Personality Inventory-Total
SSS-T = Sensation Seeking Scale-Total
WAQ-T* = Workplace Adaptation Questionnaire-Total (does not include Satisfaction With Learning Experiences subscale)

negative and statistically significant correlation (-.20) with the WAQ Total Scale. Since the sensation-seeking variety of curiosity may not be normally be associated with workplace activities per se, the observed correlation is consistent with expectations. The two Sensation Seeking subscales of the NES, comprising half of the NES Total Scale, more than likely accounted for its lower, yet significant relationship to the WAQ Total Scale.

Subscale Intercorrelations. To further investigate the relationship between curiosity and socialization-related learning, the 12 subscales of the four curiosity measures and the three relevant socialization-related learning subscales were intercorrelated. The results of that analysis is located in Table 4.11.

As was evident from examining the Total Scale intercorrelations, the patterns of correlations between both of the State-Trait curiosity measures and socialization-related learning were consistent. The MCI State and Trait subscales were most highly correlated to the WAQ subscales, followed by both of the the STPI subscales, and lastly by the NES subscales. All of the correlations between the State-Trait subscales of both instruments correlated positively and significantly to the WAQ subscales ($p < .05$). The Internal and External Cognitive subscales of the NES, as well as its Internal Sensation subscale, all correlated positively and significantly with the JK subscale of the WAQ only ($p < .05$).

The Internal Cognitive and Sensation subscales of the NES once again demonstrated some ambiguity because of their moderate positive interrelationship ($r = .48$). Finally, only the TS subscale of the SSS had an anticipated significant, yet negative correlation with the JK and AC subscales of the WAQ. Apparently, then, the learning associated with the socialization process does not necessarily rely on the sensation seeking type of curiosity. Therefore, the socialization process could arguably be considered a largely cognitive process.

Additional evidence for the observation that socialization-related learning is probably a cognitive process can be obtained from Table 4.12. Table 4.12 represents the intercorrelations between the subscales of the WAQ and the newly-derived Cognitive- and Sensation-Seeking curiosity factors from this study (according to Giambra, Camp, and Grodsky, 1992, these terms would correspond to Ainley's (1987) depth-of-interest and breadth-of-interest curiosity factors, respectively). The Cognitive Curiosity factor had a low to moderate, but positive and statistically significant correlation with all three of the WAQ subscales ($p < .01$). The Sensation-Seeking curiosity factor, conversely, had a low negative, yet significant correlation with only one of the WAQ

Table 4.11

Intercorrelations Between Curiosity and Socialization-Related Learning Subscales (N=233)

	JK	AC	ER
MCI-S	.31	.31	.22
MCI-T	.34	.27	.22
NES-ES	-.06	-.08	-.02
NES-IC	.34	.10	.10
NES-IS	.23	-.02	.08
NES-EC	.16	.02	.03
STPI-S	.24	.23	.15
STPI-T	.27	.28	.14
SSS-DS	-.11	-.01	.05
SSS-BS	-.12	-.08	-.07
SSS-TS	-.17	-.22	-.08
SSS-ES	.03	-.10	-.03

Note. All correlations greater than $\pm .19$ $p < .001$

All correlations $\leq \pm .13$ are not statistically significant at the .05 level

MCI-S = Melbourne Curiosity Inventory-State

MCI-T = Melbourne Curiosity Inventory-Trait

NES-ES = Novelty Experiencing Scale-External Sensation

NES-IC = Novelty Experiencing Scale-Internal Cognitive

NES-IS = Novelty Experiencing Scale-Internal Sensation

NES-EC = Novelty Experiencing Scale-External Cognitive

STPI-S = State-Trait Personality Inventory-State

STPI-T = State-Trait Personality Inventory-Trait

SSS-DS = Sensation Seeking Scale-Disinhibition

SSS-BS = Sensation Seeking Scale-Boredom Susceptibility

SSS-TS = Sensation Seeking Scale-Thrill and Adventure

SSS-ES = Sensation Seeking Scale-Experience Seeking

WAQ-JK = Workplace Adaptation Questionnaire-Job Knowledge

WAQ-AC = Workplace Adaptation Questionnaire-Acculturation

WAQ-ER = Workplace Adaptation Questionnaire-Establishing Relationships

Table 4.12

Curiosity Factor and Socialization-Related Learning Subscale

Intercorrelations (N = 233)

<u>Curiosity Factors</u>	<u>JK</u>	<u>AC</u>	<u>ER</u>
Cognitive Curiosity	.38	.26	.19
Sensation Seeking	-.09	-.18	-.03

Note. Bold numbers significant ($p < .01$).

JK = Job Knowledge

AC = Acculturation

ER = Establishing Relationships

The two curiosity factors were correlated .00 and accounted for 48.5% of the total variance.

subscales (the AC). This can be accounted for perhaps by the fact that employee acculturation relies heavily on learning the structure of the organization, i.e., its rules, policies, and procedures. It seems plausible that the Sensation-Seeking curiosity behavior would not be prized by other members of the employee's immediate work group, nor by their supervisors, especially when trying to complete necessary work tasks. Therefore, sensation seeking may be discouraged in general and could be a detriment to being successfully acculturated as well.

In conclusion, it is interesting to note that by reviewing the pattern of the subscale intercorrelations, the socialization-related process could be viewed usefully as a cognitive process. Remember, an employee's successful "fit" into an organization requires a very substantial amount of proactive information seeking (Ostroff and Kozlowski, 1992), and thus curiosity to learn their respective job roles and task requirements in order to realize acceptable levels of job performance. It seems likely that without being at least somewhat curious and proactively seeking information from nonpersonal and interpersonal sources, meaningful learning may not occur. Consequently, the individual may fail to adjust to their new work environment, and departure from the organization would appear to be more assured. Finally, therefore, curiosity may be indeed a relevant and positive component of socialization-related learning and ultimately the socialization process itself.

Exploring the Interrelationships Between Curiosity and Job Performance

In this section of Chapter IV investigation of the second research question is presented, "What is the relationship of selected measures of curiosity to different facets of job performance?"

Job Performance Measure. A job performance questionnaire measure, consisting of three two-item, subscales (six 10-point Likert items overall), was developed for the purpose of this study. This was a slight modification of the method Reeve (1989) used to assess perceived performance on the completion of a task (he used simply one question to assess performance. Two questions were utilized in this study to increase reliability). Because one of the purposes of this study was to investigate curiosity's relationship with different facets or dimensions of job performance, a measure was designed to assess the two job performance dimensions (i.e., technical or task and interpersonal or contextual performance) theorized by Motowidlo and Van Scotter (1994). The third subscale, which asked the subject to assess their overall job performance, was included as an attempt to add balance to the instrument. The means, standard deviations, and Cronbach's alphas for the job performance subscales are situated in Table 4.13 (means for the subscales were determined by simply

Table 4.13

Job Performance Instrument Scale Descriptive Statistics and
Internal Consistencies (N = 233)

	Mean	Standard Deviation	Cronbach alpha
JPO	7.94	1.52	.66
TJP	7.12	2.11	.71
IJP	7.81	1.74	.71
JP-T	7.62	8.81	.90

Note. JPO = Job Performance Overall
TJP = Technical Job Performance
IJP = Interpersonal Job Performance
JP-T = Job Performance-Total Scale

adding the two items in each subscale together and dividing by two).

Participants, interestingly, rated themselves lowest on Technical Job Performance and the mean rating was barely in the "good" range (i.e., 7.12 on a scale of 1-10). Subjects rated themselves 10% higher in Interpersonal Job Performance (7.81). Because much of the sample is comprised of new employees, this would seem plausible. While the internal consistency of the total instrument was .90, the Technical and Interpersonal subscale internal consistencies were both .71 and should be viewed cautiously nevertheless, especially since these were only two-item subscales. It is recommended that further research on job performance should incorporate at least 5 to 10-item Technical and Interpersonal subscales for higher reliability.

Total Scale Interrelationships. The interrelationships between the Total Scale scores of the four curiosity instruments of this study (i.e., the MCI, STPI, NES, and SSS) and the Total Scale score of the job performance measure (JP-T) are presented in Table 4.14.

All of the curiosity total scales had at least a low to moderate statistically significant relationship with the JP-T ($p \leq .001$). Once again the MCI total scale (MCI-T) had the highest positive correlation (.43), predictably followed by the STPI total scale (STPI-T, .32), and the NES total scale (NES-T, .23). Although weak, the SSS total scale (SSS-T) had the only negative relationship with JP-T (-.24).

Investigation of the Total Scale correlations indicated similar patterns of low to moderate relationships as was observed on the Workplace Adaptation Questionnaire. This is not surprising when considering that the WAQ and JP-T are positively correlated (.58). Indeed, because both instruments are indicators of self-perceived learning (the WAQ emphasizes socialization-related learning and the JP-T is arguably the sum total of much of one's technical and interpersonal skill knowledge), there should have been some sort of positive relationship between scores of the two instruments.

Another relationship of interest was the low, but statistically significant negative correlation between the SSS-T and JP-T. This suggests once again that the Sensation-Seeking variety of curiosity may not be highly valued in the workplace environments of this study. It is Cognitive Curiosity, then, that may play a more meaningful role in the development of the skills and competencies that contribute to higher levels of employee job performance.

Table 4.14

Curiosity and Job Performance Total Scale Intercorrelations

	MCI-T	NES-T	STPI-T	SSS-T	JP-T
MCI-T	----	.36	.60	-.02	.43
NES-T			.29	.21	.23
STPI-T				-.04	.32
SSS-T					-.24
JP-T					----

Note. N = 233. Bold numbers ($p \leq .001$)
MCI-T = Melbourne Curiosity Inventory-Total
NES-T = Novelty Experiencing Scale-Total
STPI-T = State-Trait Personality Inventory-Total
SSS-T = Sensation Seeking Scale-Total
JP-T = Job Performance-Total

Subscale Interrelationships. All of the Cognitive Curiosity measures' subscales (MCI-T, MCI-S, STPI-T, STPI-S, NES-EC, and NES-IC) correlated positively and significantly with the three job performance subscales except for one (the External Cognitive subscale of the NES failed to correlate significantly with the Interpersonal Job Performance subscale). These results (located in Table 4.15) logically follow the patterns of correlations between the Total Curiosity and Job Performance scales previously mentioned in this section.

What is interesting about these correlations is the Cognitive Curiosity subscales, while correlating low to moderately, are positively related to both dimensions of job performance (i.e., Technical and Interpersonal). The importance of this is that Cognitive Curiosity may play a role in not only technical job performance, which is an intuitively sound notion, but also in interpersonal job performance where an employee must rely on their interpersonal skills to manage acquiring information from one's peers, supervisors, and the like.

The SSS's subscales (Disinhibition, Boredom Susceptibility, Thrill and Adventure Seeking, and Experience Seeking) were almost all negatively related to the Technical and Interpersonal Job Performance subscales. Of special interest was the Disinhibition subscale (DS); it was the only SSS subscale to have a significant relationship with all of the job performance subscales. Since the Disinhibition subscale reportedly measures the seeking of stimuli through sexual activity, partying, and drinking, the observed correlations between the Technical Job Performance subscale and two more of the SSS' subscales (Boredom Susceptibility and Thrill and Adventure Seeking) would seem to be in order as well. Boredom Susceptibility refers to one's tolerance of boredom or lack of arousing stimuli in the immediate environment, while Thrill and Adventure Seeking describes one's desire to seek sensation stimuli through physically risky activities. Thus, in the organizations of this study, these aforementioned behaviors would not seem well-suited for acquiring technical job skills and raising the level of one's technical job performance. Of note, too, was the lack of any relationship of the SSS' Experience Seeking subscale with the Job Performance subscales. It could be that Experience Seeking, that is, the desire to seek unusual experiences through the unconventionalness of one's lifestyle, may not have any role in the performance of one's job.

To further examine curiosity's possible relevance in job performance, correlations were determined between the two new curiosity factors derived in this study and the job performance subscales (see Table 4.16). The Cognitive-Curiosity factor was positively and somewhat moderately related to the job performance subscales of interest in this study (TJP, .40; IJP, .36), and to a

Table 4.15Curiosity and Job Performance Subscale Intercorrelations

	JPO	TJP	IJP
MCI-S	.42	.34	.33
MCI-T	.35	.30	.34
NES-ES	-.07	-.06	-.11
NES-IC	.29	.37	.21
NES-IS	.12	.15	.12
NES-EC	.15	.25	.08
STPI-S	.25	.20	.29
STPI-T	.27	.25	.28
SSS-DS	-.19	-.25	-.16
SSS-BS	-.13	-.18	-.11
SSS-TS	-.15	-.17	-.11
SSS-ES	-.02	-.02	.02

Note. $N = 233$. All correlations greater than $\pm .19$ $p < .001$.

All correlations $\leq \pm .13$ are not statistically significant at the .05 level

MCI-S = Melbourne Curiosity Inventory-State
MCI-T = Melbourne Curiosity Inventory-Trait
NES-ES = Novelty Experiencing Scale-External Sensation
NES-IC = Novelty Experiencing Scale-Internal Cognitive
NES-IS = Novelty Experiencing Scale-Internal Sensation
NES-EC = Novelty Experiencing Scale-External Cognitive
STPI-S = State-Trait Personality Inventory-State
STPI-T = State-Trait Personality Inventory-Trait
SSS-DS = Sensation Seeking Scale-Disinhibition
SSS-BS = Sensation Seeking Scale-Boredom Susceptibility
SSS-TS = Sensation Seeking Scale-Thrill and Adventure
SSS-ES = Sensation Seeking Scale-Experience Seeking
WAQ-JK = Workplace Adaptation Questionnaire-Job Knowledge
WAQ-AC = Workplace Adaptation Questionnaire-Acculturation
JPO = Job Performance-Overall
TJP = Job Performance-Technical
IJP = Job Performance-Interpersonal

Table 4.16

Curiosity Factor and Job Performance Subscale Intercorrelations (N = 233)

<u>Curiosity Factors</u>	<u>JPO</u>	<u>TJP</u>	<u>IJP</u>
Cognitive Curiosity	.40 ^a	.40 ^a	.36 ^a
Sensation Seeking	-.16 ^b	-.15 ^b	-.14 ^b

Note. a = ($p < .0001$); b = ($p < .05$)

JPO = Job Performance-Overall

TJP = Job Performance-Technical

IJP = Job Performance-Interpersonal

very similar degree ($r^2 = .16$ and $.13$, respectively, while the Sensation Seeking factor's $r^2 = .02$ and $.02$, respectively). These correlations all indicate that Cognitive Curiosity has a relationship with the two job performance dimensions, (i.e., Technical and Interpersonal Job Performance), although causality is not implied. Secondly, consistent with expectations, the Sensation-Seeking factor had a significant, yet low negative relationship with the job performance subscales (TJP, $-.15$; IJP, $-.14$).

Curiosity Factor Scores

As was done with the socialization-related learning variable, factor scores from each of the four rotated curiosity factors were used in regression models for predictive purposes. The two-, three-, and four-factor scores were placed into three respective regression models as independent variables with job performance as the dependent variable. The four curiosity predictors accounted for 22.8% ($p < .0001$) of the total variance for the first model. Three curiosity predictors accounted for 32.0% ($p < .0001$) of the total variance of the regression model, yet factors two and three were not significant contributors to the model. This once again suggests ambiguity between the Venturesomeness and Sensation Seeking curiosity factors which may have limited their research utility in this study. Finally, the two curiosity predictors accounted for 22.7% ($p < .0001$) of the regression model's total variance. Because the two-factor model explains almost an identical amount of total variance than the four-factor model, and since it is the more parsimonious of the regression models as well, it seemed most appropriate once again to view curiosity along two dimensions (i.e., Cognitive Curiosity and Sensation Seeking) for the purposes of this study.

Thus, what is relevant to the purpose of this research is these results are support that curiosity (i.e., both the Cognitive- and Sensation-Seeking varieties of curiosity) has a role in both theorized dimensions of job performance. Curiosity-induced information seeking behaviors may therefore be important to navigate through learning the technical and interpersonal skill requirements of one's job. Cognitive curiosity may be more important in guiding and motivating relevant workplace learning, while sensation seeking may be considered an unproductive type of workplace behavior that is not promoted.

Testing for Causal Relationships

This part of Chapter IV will explore the answer to the third and last research question, "What is the extent of the possible mediating effect of socialization-related learning between curiosity and job performance?" (i.e., To what extent does socialization-related learning mediate the relationship between curiosity and job performance?).

Testing the Causality of the Curiosity and Socialization-Related Learning Relationship. Through a careful review of the literature, it seemed assured that curiosity would have a possible relationship with socialization-related learning, yet no research to date had examined this relationship. Thus, a theoretical model was proposed *a priori* that curiosity had a causal relationship with socialization-related learning. The model utilizes the Trait and State global measures of curiosity (Figure 1, with standardized partial regression coefficients or standardized "path coefficients"). All path coefficients were computed with EQS 5.4 for Windows using the correlation matrices from Tables 4.6 and 4.11, and their standard deviations.

In the first research question, there was a suggestion that there was a positive, although relatively weak to moderate relationship between almost all the Cognitive measures of curiosity (State and Trait curiosity as measured by the MCI and STPI, the Internal Cognitive curiosity subscale of the NES, and the Cognitive Curiosity factor) and the three dimensions of socialization-related learning. Only the relationship between the External Cognitive curiosity subscale of the NES, and the Acculturation and Establishing Relationships subscales of the WAQ did not reach statistical significance.

To determine the degree of causality between these variables, standardized path coefficients were calculated for the paths between curiosity and socialization-related learning as recommended by Cohen and Cohen (1983) and Loehlin (1992).

As can be seen from the model's path coefficients, both Trait and State Curiosity has a weak causal influence on Socialization-Related Learning. The standardized path coefficients for the Trait and State Curiosity to Socialization-Related Learning paths, located in Figure 1, are .22 and .20, respectively. According to the model, what this means is if we were to select individuals one standard deviation above the mean in Trait Curiosity, on average, holding all else constant, we could expect a .22 standard deviation increase in socialization-related learning. Likewise, by increasing State Curiosity one standard deviation we could expect a .20 standard deviation increase in socialization-related learning, on average, with all else held constant. The R^2 of the proposed model was .157, or 15.7% of the total variance in socialization-related learning was explained by this theoretical model. At first glance, this proposed model does not seem to be particularly meaningful. However, it must be remembered that the subjects of this study were not "stimulated" before taking the battery of curiosity tests. If the subject's curiosity about a particular relevant topic was somehow stimulated before administering the State and Trait Curiosity measures (MCI and

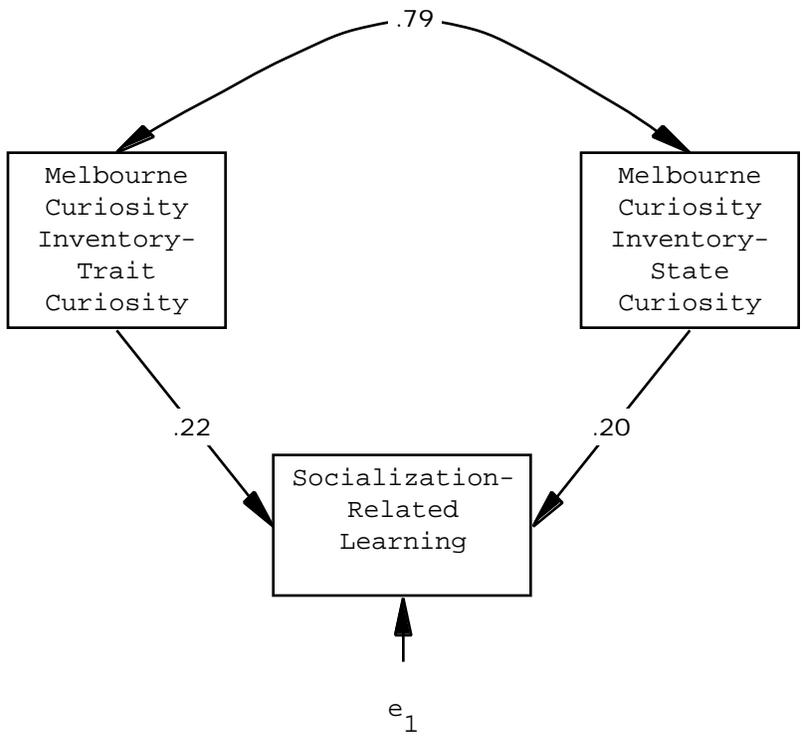


Figure 1. Melbourne Curiosity Inventory-State and Trait Curiosity and Socialization-Related Learning Path Model.

STPI) there predictably would have been higher State Curiosity scores (Naylor [1981] achieved significantly higher curiosity scores with the MCI after stimulating the participant's curiosity about science and mathematics). Thus, it seems likely there would have been much more interesting results. Nevertheless, while both Trait and State Curiosity were virtually the same in this study, the significance of this may be that stimulating one's state of curiosity during learning endeavors associated with the socialization process could be a worthwhile activity.

Intercorrelations Between the WAQ and the Job Performance Scales.

Common sense would dictate that there must be some meaningful relationship between socialization-related learning and job performance, yet little information exists about this relationship in the literature.

First, the intercorrelations between the Total Scales of both the WAQ and the Job Performance instrument were examined for a significant correlation; the correlation between the two variables was .58 ($p < .01$). The WAQ was also moderately related to both of the Technical and Interpersonal Job Performance subscales (.49 and .45, respectively). Secondly, interscale correlations between the WAQ and Job Performance subscales were (excluding the Overall Job Performance subscale because it is not a separate dimension of job performance) examined for meaningfulness. The Technical and Interpersonal Job Performance subscales correlated positively and significantly with the WAQ subscales ($p < .05$). The Job Knowledge subscale of the WAQ had the highest correlation with the Technical Job Performance subscale (.57), and Total Job Performance (.62), which makes considerable sense. Although moderately weak, the Acculturation (.36) and Job Knowledge (.38) subscales of the WAQ were related with the Interpersonal Job Performance subscale ($p < .01$). See Table 4.17 for further details.

Testing the Acquiring Job Knowledge Theoretical Model

Morton (1993) proposed a conceptual model for acquiring job knowledge in the socialization process (see Figure 2). Her research indicated that new employees 1) start the socialization-related learning process by establishing relationships with their peers; then, 2) through their peers and supervisors the newcomer learns the rules and procedures of the organization; and lastly, 3) by going through the first two steps, acquire the knowledge necessary to perform their job. Since part of this research is similar to the Morton study, it was decided to test her theoretical model for causality with the sample from this study. The model with appropriate standardized path coefficients for the theoretical paths are presented in Figure 3. The standardized path coefficient for the ER to AC path was .43, and the AC to JK path's standardized path coefficient was .42. In essence, this

Table 4.17

Intercorrelations Between WAQ and Job Performance Scales

	JK	AC	ER	WAQ-T
TJP	.57	.23	.17	.49
IJP	.38	.36	.21	.45
JP-T	.62	.34	.23	.58

Note. N = 233.

JK = Job Knowledge-WAQ

AC = Acculturation-WAQ

ER = Establishing Relationships-WAQ

WAQ-T = Workplace Adaptation Questionnaire-Total

TJP = Technical Job Performance

IJP = Interpersonal Job Performance

JP-T = Job Performance-Total

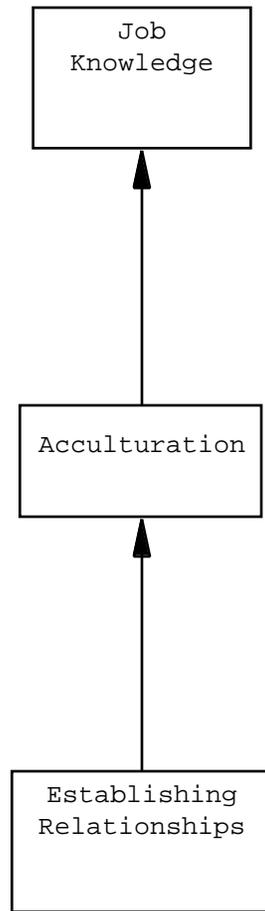


Figure 2. Job Knowledge Acquisition Conceptual Model.

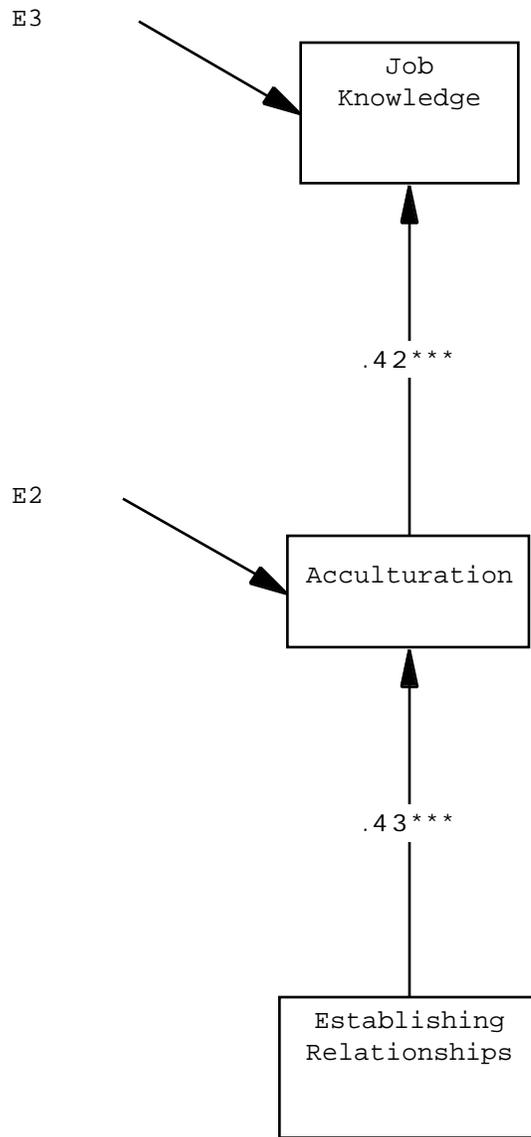


Figure 3. Job Knowledge Acquisition Path Model

model allows for solely an indirect relationship between Establishing Relationships (ER) and Job Knowledge (JK). Thus, Acculturation mediates the relationship between ER and JK in this conceptual model.

Nevertheless, Morton (1993) reported that Acculturation contributed very little to JK. Upon checking the fit of the model to the data, the Comparative Fit Index (CFI) was below conventional acceptance (a .90 is needed [Loehlin, 1992]; this model was .89 and thus the data disconfirmed the model).

A revised Job Knowledge Acquisition model was then proposed that allowed for a direct as well as an indirect effect of ER on JK (Figure 4). Apparently, there is also a weak direct effect of ER on JK, as the standardized path coefficient was .23 (R^2 of direct path to JK was 18.6). The new standardized path coefficients for the remainder of the model were as follows: the ER to AC path .43, and the AC to JK path .32 (R^2 of this indirect path to JK was .22). Because this is a just-identified model, a CFI could not be calculated, but the model seemed to be much more conceptually appealing. Therefore, while more of the variance of job knowledge was explained by the indirect path of ER to JK, the direct path of ER to JK is also necessary to more fully understand the role of establishing relationships in acquiring job knowledge in the socialization process.

These results indicate there is support for the Morton Acquiring Job Knowledge Conceptual Model. There was a suggestion that establishing relationships has both a direct and indirect effect on job knowledge, as claimed by Morton (1993). Consequently, it can be said that establishing relationships with one's peers and supervisors has a direct effect on acquiring job knowledge. Secondly, the acculturation process (being acculturated to the company) mediates the relationship between establishing relationships and acquiring job knowledge, and hence learning, in the workplace socialization process of the employees of this study.

The Curiosity-Socialization-Related Learning-Job Performance Theoretical Model. Three simple theoretical models, proposed *a priori*, concerning the possibility of a mediational effect between curiosity and job performance will be proposed to directly answer our third research question.

Guided by the literature, a theoretical model of job performance was proposed that suggested that successful job performance could be thought of as the culmination of a great deal of workplace learning knowledge. Curiosity was theorized to be a beginning of the process of learning one's job. It is important in maintaining and directing this learning; thus,

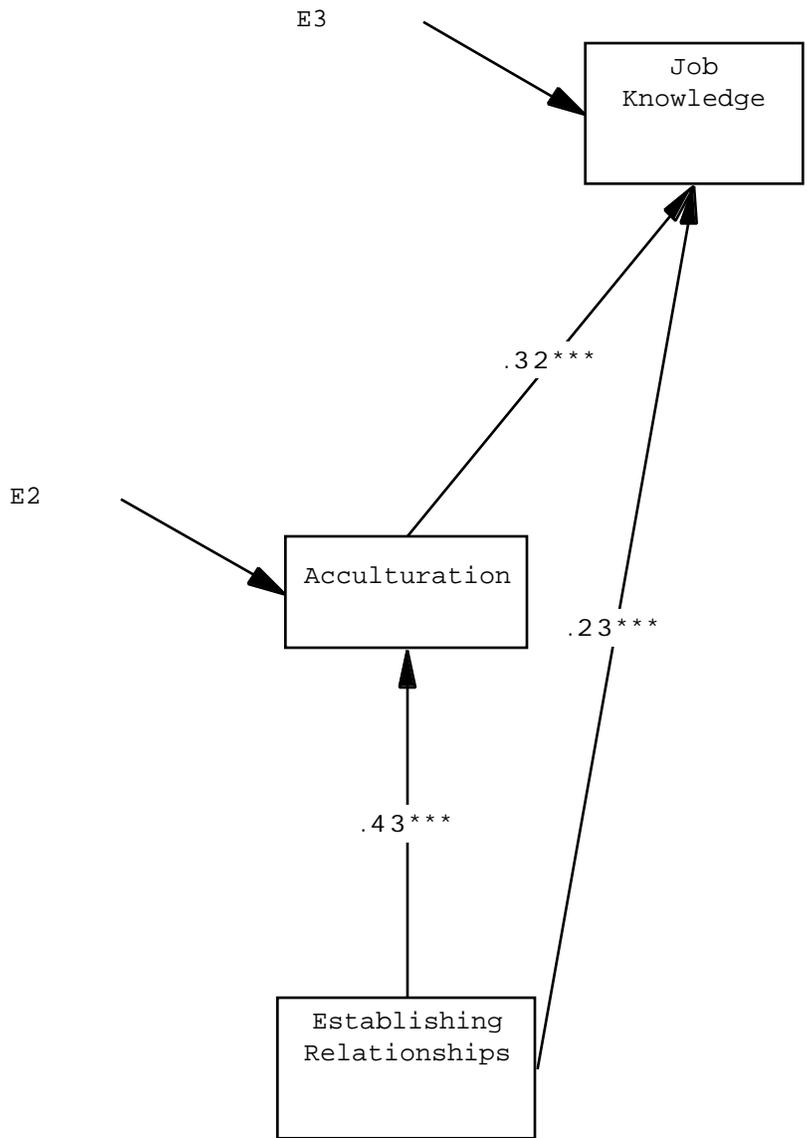


Figure 4. Job Knowledge Acquisition Path Model (Revised)

facilitating the development of appropriate skills to acquire a degree of competence in one's work, and ultimately improving one's job performance. Socialization-related learning was, then, theorized to possibly mediate the curiosity-job performance relationship, as there was no support in the literature of a direct relationship between curiosity and job performance. The three proposed curiosity-socialization-related learning-job performance models are represented by Figures 5, 6, and 7.

For Figures 5, 6, and 7, the Melbourne Curiosity Inventory was used as the curiosity variable(s). The curiosity Factor Analysis showed that both the MCI and STPI are measuring the same single factor (i.e., Cognitive Curiosity), and for future purposes the curiosity instrument that had the highest relationship with both the socialization-related learning and job performance variables was used, i.e., the MCI. The STPI and NES yielded similar statistically significant results, yet the results were not quite as robust. Factor scores, contrived from a combination of several instruments, were not used in this study's path models because their use would not be practical, especially for practitioners, due to limited access to several of the instruments. As a precaution, however, path models utilizing factor scores were run with very similar results to the MCI.

In Figure 5, where curiosity is represented as a single construct for the purpose of this simple theoretical model, the standardized path coefficient for the path between curiosity and socialization-related learning is .39, while the socialization-related learning to job performance standardized path coefficient is .58. When interpreting this model, one would say that curiosity has an indirect causal relationship with job performance, mediated through socialization-related learning. Yet, the CFI for this theoretical model was .89; thus, these data disconfirmed the model, suggesting the need for an additional path to more fully explain the possible curiosity to job performance relationship.

In Figure 6, there is also a direct curiosity to job performance path. The standardized path coefficient for the new curiosity path to job performance is .23. The curiosity to socialization-related learning path is .40, the socialization-related learning to job performance path's standardized path coefficient is .49. The multiple R of the direct curiosity path to job performance is .16, while the path mediated by socialization-related learning is .38.

Figure 7 is a path model where the job performance variable is split into its two dimensions, i.e., Technical and Interpersonal Job Performance. With a CFI of .92, the data failed to disconfirm the model. There was no direct causal influence of

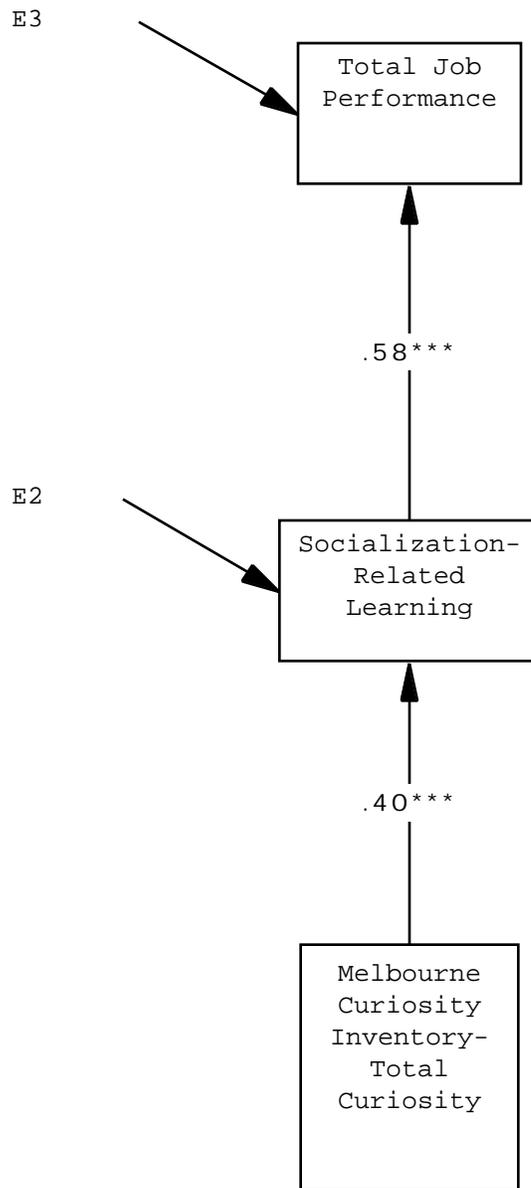


Figure 5. Curiosity to Job Performance Path Model

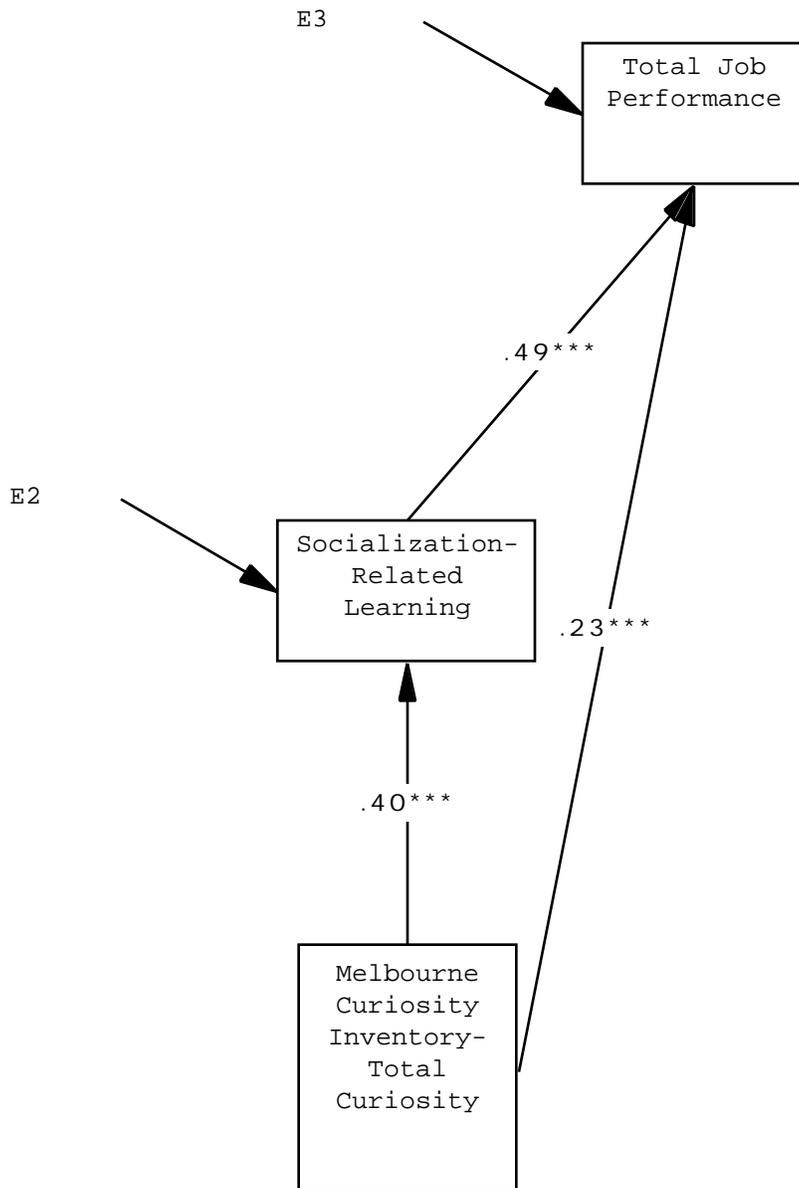


Figure 6. Curiosity to Job Performance Path Model (Revised)

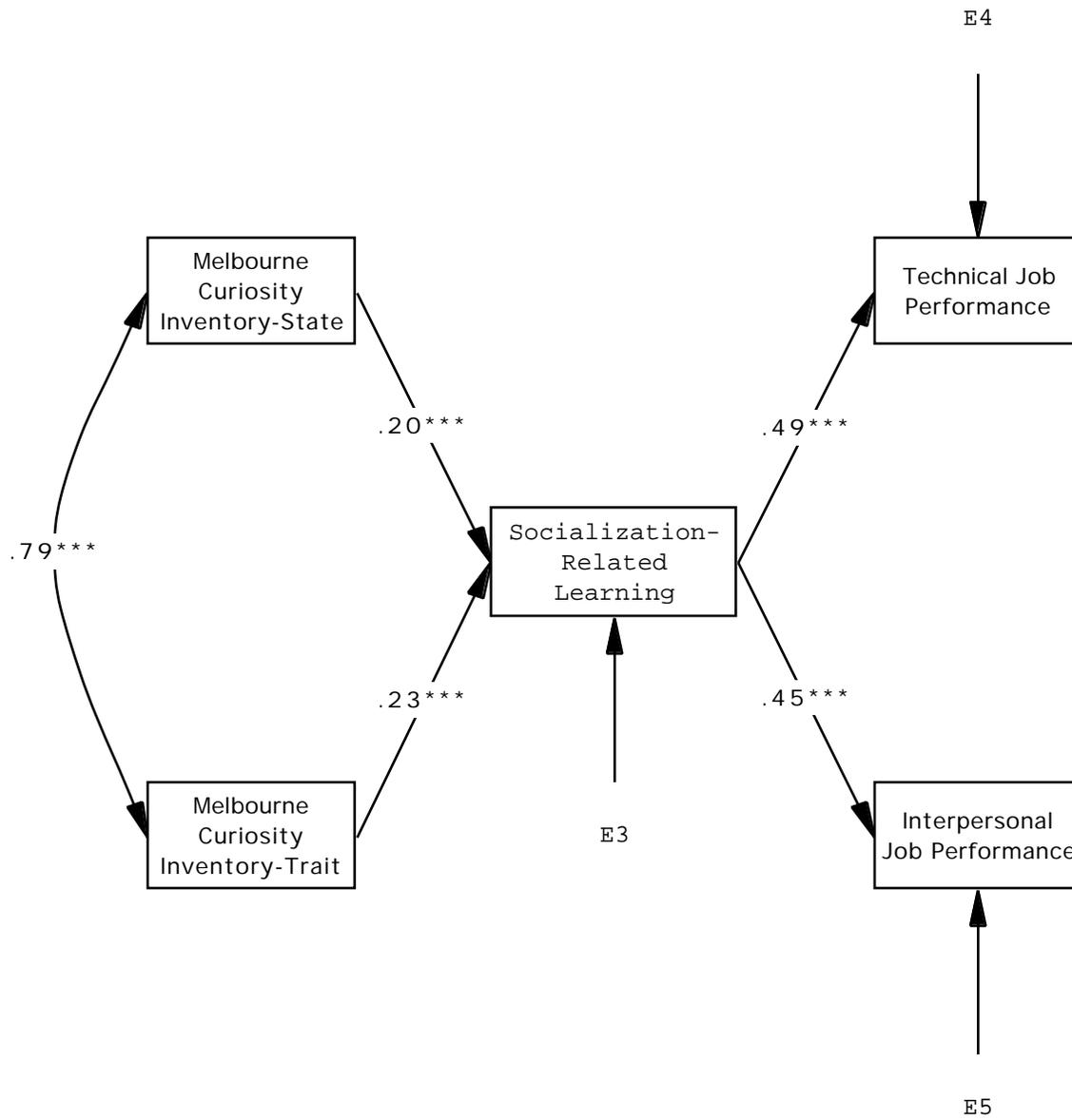


Figure 7. Curiosity to the Dimensions of Job Performance Path Model

State or Trait curiosity on either of the job performance dimensions. Thus, the influence of State and Trait Curiosity on Technical and Interpersonal Job Performance was solely through the mediation of the Socialization-Related Learning variable.

According to our theoretical models of job performance, then, adult curiosity may have a weak direct causal influence on general job performance, and socialization-related learning also serves a mediational role in the curiosity-job performance relationship. When the dependent variable is split into its two dimensions, curiosity's only influence on Technical and Interpersonal Job Performance is an indirect, but significant one.

Implications of the Results

Comparisons to other organizations or businesses should be made with caution, as this study's data relied exclusively on introspective research instruments and was obtained from a combination of participants in one particular kind of work industry, i.e., the service industry.

Chapter Summary

The findings of the study indicate that the Workplace Adaptation Questionnaire was a reliable research instrument for the purpose of researching socialization-related learning in the workplace. In addition, support was found for the Morton (1993) Acquiring Job Knowledge Conceptual Model.

Further, the results of this research suggested a weak to somewhat moderate positive Cognitive Curiosity and Socialization-Related Learning relationship in the workplace, and a moderate socialization-related learning to job performance relationship as well. A weak negative correlation between the Sensation-Seeking variety of curiosity-behavior and socialization-related learning and job performance indicated that these behaviors may not be fostered in the workplaces of this study. Finally, several theoretical models were tested. The results provided support for a causal relationship between curiosity and socialization-related learning; and a causal relationship between socialization-related learning and job performance. Lastly, curiosity was found to have an indirect causal relationship with Technical and Interpersonal Job Performance, through the mediating effect of socialization-related learning, and a weak causal influence on total or general job performance as well.

Chapter V will present the implications of the study and make tentative conclusions within the limitations of this research. Recommendations for future research will also be discussed.

CHAPTER V DISCUSSION

Although curiosity has been recognized by many researchers (e.g., Berlyne, 1978; Cavaliere, 1996) as an important component of learning in general, its possible relationship to and importance in adult learning remains little understood. This research was an empirical investigation of the relationship of adult curiosity with a particular kind of informal workplace learning, socialization-related learning, and two dimensions of job performance.

Specifically, the three research questions of this study were as follows:

1. What is the relationship of selected measures of curiosity to socialization-related learning?
2. What is the relationship of selected measures of curiosity to different facets of job performance?
3. What is the extent of the possible mediating effect of socialization-related learning among the *a priori* determined variables: curiosity and job performance? (i.e., To what extent does socialization-related learning mediate the relationship between curiosity and job performance?)

Four questionnaire measures of curiosity, an introspective socialization-related learning instrument, and a job performance questionnaire were administered to 237 service-industry employees. After careful screening, four subjects were eliminated due to incomplete responses, leaving a final sample of 233. The typical participant in this study was a Caucasian male less than 40 years old, with some college, earning less than \$30,000 per year, and possessing less than two years of prior work experience.

The four curiosity instruments were factor analyzed to identify a parsimonious number of curiosity factors and to thereby clarify the nature of the curiosity construct. The factor scores derived from these factors were then used in predictive procedures. The two- and three-factor solutions were further examined for research utility.

The Workplace Adaptation Questionnaire (Morton, 1993), this study's informal workplace learning instrument, was examined for internal consistency and factor analyzed to determine the stability of its subscale factor structure. Even after the addition of three additional Job Knowledge questions to the instrument, the subscale items loaded clearly on the predicted

subscale, and the loadings were consistent with those reported by the Morton study.

Further, the Morton (1993) Job Knowledge Acquisition Conceptual Model was investigated. Despite a totally different kind of research sample, including individuals with more than two years of tenure in their current jobs, there was support for the model.

The intercorrelations between all the curiosity, socialization-related learning, and job performance scales were examined for significance and meaningfulness. Several theoretical models were then tested to assess whether socialization-related learning may mediate the curiosity and job performance variables of this study.

The Multidimensional Nature of Curiosity

Considerable controversy exists concerning the exact nature of the curiosity construct. Even though Daniel E. Berlyne, the "Father of Curiosity," predicted that curiosity would ultimately be seen as a unidimensional construct through perhaps utilizing advanced multivariate techniques, little empirical evidence exists to date that would support this notion.

Loewenstein (1994), nonetheless, credited Berlyne's "path-breaking" research as the stimulus for a great deal of investigation into the definition and nature of curiosity (p. 77). Yet, even as alternative curiosity theories have been developed, most curiosity researchers have still at least implicitly conceded curiosity's dimensionality (e.g., Ainley, 1987; Byman, 1993).

One of the purposes of this study was to identify and clarify the curiosity construct in order to understand curiosity's possible relationship with adult learning as well as job performance, an indicator of successful workplace learning. First, the factor-analytic results indicated plausible two-, and three-factor solutions (the four-factor solution had two factors that had but two loadings and were viewed with extreme caution), clearly demonstrating that even among questionnaire measures of curiosity, the curiosity construct is multidimensional.

The three-factor solution identified the following factors: Cognitive Curiosity (Factor 1), Venturesomeness (Factor 2), and Sensation Seeking (Factor 3). Cognitive Curiosity was clearly comprised of both State and Trait measures of curiosity (the MCI and STPI). However, ambiguous loadings were found for the Novelty Experiencing Scale (NES) subscales, as the Internal and External Cognitive (IC and EC), and the Internal Sensation (IS) subscales loaded on Factor 2 as well.

Factor 2, Venturesomeness, was comprised of the four NES subscales, with only the External Sensation (ES) subscale loading clearly; two of the SSS subscales (Thrill and Adventure Seeking and Experience Seeking) loaded as well. Sensation Seeking, Factor 3, consisted solely of three loadings from the Sensation Seeking Scale. Only the Experience Seeking subscale of the SSS loaded unclearly (it also loaded on Factor 2).

These results demonstrated a considerable amount of conceptual ambiguity between the first two of three curiosity dimensions identified in this study. The Sensation Seeking and Venturesomeness factors also overlapped considerably, indicating that they are not totally independent. These results corroborate the earlier findings of Ainley (1987) and Byman (1993).

Due to the ambiguity between the factor loadings, especially between Factors 2 and 3, a two-factor solution was examined as well. Cognitive Curiosity (Factor 1) and Sensation Seeking (Factor 2) were the two factors identified. Factor 1 consisted of both of the State and Trait curiosity subscales (MCI and STPI), and the Internal and External Cognitive subscales of the Novelty Experiencing Scale. The only ambiguous loading on Factor 1 came from the Internal Sensation (IS) subscale of the NES.

Factor 2 in the two-factor curiosity solution was comprised of all four subscales of the SSS (Disinhibition [DS], Boredom Susceptibility [BS], Thrill and Adventure Seeking [TS], and Experience Seeking [ES]), and the External and Internal Cognitive subscales of the NES. Once again, the Internal Sensation subscale of the NES loaded on both Factors 1 and 2.

Apparently, there is a conceptual overlap in the kinds of questions comprising the IS subscale; thus perhaps accounting for, in part, the IS subscale's moderate correlation with the IC subscale of the NES, and its ambiguous loadings on both of the curiosity factors. The Internal Sensation subscale's original questions were examined to determine why it was loading on both factors, instead of just the Sensation Seeking factor. Part of its ambiguous loading may be attributed to its apparent lack of emphasis on "risk taking" and "physical thrill seeking" activities, central components of the Sensation Seeking Scale's, TS, and DS subscales. Even the ES and BS subscales of the SSS seem to have mostly a physical or "taking action" component to them. The IS subscale of the NES focuses both on internal, cognitive activities like daydreaming and fantasizing, and activities emphasizing the desire for new physical experiences and sensations.

Despite concern about the three-factor curiosity solution, both the two- and three-factor solutions were selected for further use in this study in an effort to construct predictive

regression models of job performance (through the use of factor scores). The results indicated that the three-factor curiosity model had no more predictive ability than the two-factor model, lending support to the utility of the two-factor curiosity model recommended by Ainley (1987) and Langevin (1971).

Considering the aforementioned lack of conceptual clarity between the Sensation Seeking and Venturesomeness curiosity factors, this result is not surprising. Even after acknowledging that there may be some distinct differences between the Sensation Seeking and Venturesomeness curiosity factors (e.g., Byman, 1993, who claimed that a three-factor curiosity solution best fitted the Ainley [1987] data), the differences were not sufficient in this study to consider the factors separately. Consequently, based on the results of this research, the nature of the curiosity construct may be best explained by a two-factor curiosity model. This model consists of curiosity as either a cognitive, information and knowledge seeking activity, or a new experience or sensation seeking activity where knowledge acquisition is not necessarily the primary goal.

Reliability and Factor Stability of the Workplace Adaptation Questionnaire (WAQ)

Reliability. The WAQ (Morton, 1993) is a 19-item, self-report questionnaire measure consisting of three socialization-related learning subscales and one subscale measuring satisfaction with workplace learning experiences. In an effort to add more balance to the instrument, which seemed to be somewhat biased toward interpersonal skill acquisition (there was equal interest in technical skill acquisition in this study), three additional Job Knowledge questions, selected from those first identified in the Morton (1993) study, were added to the Job Knowledge (JK) subscale. Thus, the JK subscale now consisted of eight items, and the total instrument was comprised of 22 items.

Cronbach's alpha internal consistencies of the 4-subscale, 22-item instrument were as follows: Job Knowledge .96; Acculturation (AC) .86; Establishing Relationships (ER) .85; and Satisfaction With Learning Experiences (SLS), .81. All three of the socialization-related learning reliabilities were somewhat higher than in the Morton (1993) study.

The reliability of the JK subscale may have been noticeably higher because of the lengthening of the subscale for this study (Crocker & Algina, 1986). By adding the three items to the subscale, its total variance was increased by **both** the sum of each item's variance **and** its covariances with all other items in the subscale. Such an effect can even be more pronounced proportionally when items are added to a short scale, such as in the 5-item JK subscale. In this research, the Cronbach's alpha of the internal consistency (reliability) of the 8-item JK subscale

was .96; as a 5-item subscale, the reliability dropped to .83, mirroring the subscale's reliability in the Morton (1993) study.

Considering this evidence, it may be advantageous to retain the three new JK subscale questions in an updated version of the WAQ, especially for researchers investigating socialization-related job knowledge. The extra questions would not significantly add to the time required to take the test, and the modified 22-item scale instrument would still easily fit on one page. In addition, the increased reliability of the JK subscale would increase the likelihood of desirable consistency or reproducibility of what the subscale is supposed to measure, i.e., self-perception of job knowledge associated with the socialization process.

Subscale Factor Stability. Varimax factor analysis (with an oblique solution) of the WAQ indicated that, with only one exception, items loaded clearly on their respective subscale factors. Question 5 of the AC subscale, i.e., "I know the informal rules, policies, and procedures of my organization," loaded on both the AC and SLS subscale factors (WAQ Factors 3 and 4). This is perhaps because of the participant's understanding of the term "informal." Item 8, too, of the JK subscale ("I know what resources are available to help me do my job") loaded poorly on its respective subscale factor, suggesting it may not be an adequate indicator of socialization-related job knowledge.

In conclusion, the WAQ subscales appear to possess overall an acceptably high degree of reliability and a stable subscale factor structure. The addition of three questions to the JK subscale increased its internal consistency or reliability and is recommended for inclusion in a modified version of the WAQ, despite concerns about the low loading of question 8 (the item loaded clearly with the females in this study, however). Minor word clarification in question 13 of the AC subscale and, possibly, question 8 of the JK subscale could further strengthen the instrument's subscale factor structure.

Curiosity and Socialization-Related Learning

With regards to the first research question, the findings of this study indicated that the cognitive measures of curiosity (i.e., both of the State and Trait curiosity measures [the MCI and STPI], the NES' Internal Cognitive subscale, and the Cognitive Curiosity factor derived from this study) had a positive, yet somewhat low to moderate relationship with socialization-related learning, as represented by the Workplace Adaptation Questionnaire. On the other hand, the sensation seeking measures of curiosity (the SSS' Thrill and Adventure Seeking [TS] subscale and the Sensation Seeking curiosity factor derived from this study) had a weak negative relationship with socialization-related learning.

The relationship, nonetheless, between the Sensation Seeking curiosity measures and socialization-related learning was quite intriguing. This negative, but low statistically significant relationship may suggest the presence of at least some logical bias toward the seeking of new sensations and physical experiences among the organizations participating in this study.

An organization, in general, is comprised of a group of individuals working toward a common goal. A certain degree of employee conformity to the norms, values, and procedures is at least expected, and at most demanded, for successful socialization into the organization. Perhaps new sensation-seeking behaviors may be deemed inappropriate in certain workplace situations because they center primarily on seeking to experience change and variation over behavior more commonly sought in conventional workplace expectations, such as "stick-to-itiveness." It may be that sensation-seeking behaviors would not be rewarded in many organizations (particularly in mature organizations where activities have become more structured and routine, there are generally more specialized departments, and, there are more standard operating procedures [Hall & Goodale, 1986]). Therefore, individuals oriented to these types of behaviors may be more likely to leave a more mature organization due to the lack of organizational support and reward, and the concomitant lack of "fit" between the individual and the organization.

There are many organizations, however, where sensation-seeking types of behaviors may be more appropriate. Organizations in the "birth" and "growth" stages may be more inclined to individuals with an affinity for sensation-seeking behavior because of their need for employees attuned to the pursuit of novelty or "newness" (Hall & Goodale, 1986). In addition, fast-paced, newness-oriented businesses like those in the entertainment industry may benefit from this kind of person because of their orientation toward seeking new and varied experiences. Such a person may be more likely to be successfully socialized in these industries since their sensation-seeking behaviors may be valued, promoted, and rewarded. A study of the extent and role of sensation-seeking behaviors in organizations may further explicate adult curiosity's role in the workplace.

Cognitive Curiosity, as indicated by the findings of this study, has an interesting relationship with socialization-related learning as well. The somewhat low to moderate positive relationship between both State and Trait measures of curiosity, the Cognitive Curiosity factor, and all three of the socialization-related learning subscales suggest that Cognitive Curiosity behaviors like observing, consulting, and thinking may, in part, play a role in the learning associated with the socialization process and therefore adult workplace learning.

The positive low to moderate statistically significant relationship between the Cognitive Curiosity measures and socialization-related learning becomes even more meaningful when considering that service industry employees would generally be expected to possess lower curiosity levels (Naylor, 1981). Naylor claimed that Realistic, Enterprising, and Conventional work interests (according to Holland's (1973) six-fold RIASEC classification of occupational interests), such as those possessed by service industry employees in general, have a very low and thus statistically **nonsignificant** relationship with State and Trait curiosity.

Nevertheless, despite the fact that the individuals in this study would not be expected to be curious (Naylor, 1981), Cognitive Curiosity (whether it was State, Trait, or the Cognitive Curiosity factor) still demonstrated a positive low to moderate statistically significant relationship with socialization-related learning. This first may be accounted for by the mean cognitive scale curiosity scores that were somewhat higher than those in the Naylor (1981) or Olson, Camp, and Fuller (1984) studies. Further, the companies in this study may have inadvertently, through the years, hired, rewarded, and retained more curious individuals than the college students participating in the other two studies. This suspicion becomes more plausible when one considers that, according to their respective trade journals, the four organizations in this study either met or exceeded industry standards for service and quality.

It also may be reasonable to conclude that the observed relationships among the variables were not significantly based on individual intelligence or general ability. Similar factor-analytic studies to this one (i.e., Ainley, 1987; Olson & Camp, 1984) reported correlations all close to zero between the same curiosity measures used in this study and various intelligence measures (the ACT and ACER).

Perhaps what is more engaging here is the notion that adult curiosity appears to be, at least in part, involved in informal workplace learning, like the socialization process, despite predictions otherwise (Naylor, 1981). Thus, curiosity and the information-seeking behaviors it elicits (e.g., question asking, thinking, and reflecting) seems to have a role in adult learning contexts, like the workplace, and not just in children's classroom situations.

These findings also lend empirical support to current research (e.g., Kozlowski, 1995; Miller & Jablin, 1991; Ostroff & Kozlowski, 1992) that the socialization process may be meaningfully viewed as an information seeking (which includes curiosity) or learning process. Employees may thus need some constant level of curiosity to proactively seek technical and

interpersonal information from organizational literature, coworkers, and supervisors to adapt to an ever-changing work environment and ultimately to perform their job well.

Curiosity and Job Performance

Motowidlo and Van Scotter (1994) theorized that it would be best to view job performance as a two-dimensional construct consisting of technical or task performance and interpersonal or contextual job performance. Thus, a 6-item self-report questionnaire, with 10-point Likert scale measurements (0=poor, 10=very good) and three two-item subscales, was developed for this study. The three subscales were as follows: Overall Job Performance, Technical Job Performance, and Interpersonal Job Performance. Only the Technical and Interpersonal subscales were analyzed to answer the second research question.

The patterns of correlations between the various curiosity and job performance total scales were very similar to those of the Workplace Adaptation Questionnaire. Primarily, there were low to moderate positive correlations between all of the Cognitive Curiosity measures and Total Job Performance (all statistically significant). There was an expected low negative statistically significant relationship between Total Job Performance and the Sensation Seeking scale as well.

Further examination of the Curiosity and Job Performance subscale intercorrelations revealed that both of the State and Trait Curiosity subscales (the MCI and the STPI) and the Internal Cognitive subscale of the Novelty Experiencing Scale had similarly low to moderate, but positive relationships with both dimensions of Job Performance as represented in this study. This result was somewhat unexpected, yet very interesting. Implicit in the curiosity literature is the notion that since curiosity is the desire for information and knowledge, it may be more related to acquiring specific technical knowledge to solve conceptual conflicts. This would be especially relevant in the workplace.

The roughly equal correlations between both of the State and Trait Curiosity scales and the Internal Cognitive subscale and Interpersonal Job Knowledge may thus be of interest. These results suggest that curiosity and information seeking may also play a role in acquiring interpersonal skills and interpersonal knowledge. There is some support in the children's curiosity literature for this observation. Maw and Magoon (1971) claimed that children with low curiosity would not reach out to the novel and strange, and seemed less tolerant of socially uncertain conditions.

In the workplace, where uncertainty and novelty can be prevalent (Dixon, 1992; Miller & Jablin, 1991), Ostroff and Kozlowski (1992) claimed a certain amount of interpersonal skill

knowledge is needed to navigate through the many sources of organizational information that are required to satisfactorily perform one's job. The results of this study suggest that curiosity-induced behaviors may be part of acquiring the interpersonal skill knowledge necessary for higher levels of interpersonal job performance; thus, supporting Ostroff and Kozlowski's relevant research.

The low negative, but statistically significant relationship between three of the Sensation Seeking Scale's subscales (Disinhibition, Boredom Susceptibility, and Thrill and Adventure Seeking), the Cognitive Curiosity factor, and Technical and Interpersonal Job Performance indicates that Sensation-Seeking curiosity behaviors may not be considered appropriate in the organizations participating in this research, particularly with regards to assessing Technical Job Performance.

Since only the Disinhibition subscale had any statistically significant relationship with Interpersonal Job Performance, only Technical Job Performance will be further discussed. The results of this research are consistent with expectations; Technical Job Performance relies in part on the acquisition of pertinent technical information and skills to handle the specific tasks associated with one's job. Sensation-Seeking curiosity activities, then, which entail seeking novel experiences and new sensations, would not seem to be particularly conducive to acquiring specific technical knowledge in the workplaces of this study.

Curiosity, Socialization-Related Learning, and Job Performance

When answering the third research question, it is important to remember that both Cognitive Curiosity and Socialization-Related Learning were positively and significantly related to both dimensions of job performance. The Job Knowledge subscale of the Workplace Adaptation Questionnaire, in particular, had a moderate positive correlation with Technical Job Knowledge ($r = .57$). The other socialization-related learning subscales (Establishing Relationships and Acculturation) had somewhat low positive, yet statistically significant correlations with both job performance dimensions (ranging from .17 to .36).

Since the Job Knowledge subscale represents a culmination of socialization-related knowledge acquired through first establishing employee relationships and then becoming acculturated to the organization (Morton, 1993), the moderate positive relationship makes considerable sense. And, considering that most of the questions in the Job Knowledge subscale ask specifically about perceived levels of technical job knowledge, at least a moderate relationship between Technical Job Performance and the

Job Knowledge subscale was to be expected. The significance of these observations, nevertheless, is that these results may support the notion that socialization-related learning ultimately influences job performance (e.g., task mastery), as Ostroff and Kozlowski (1992) proposed. Thus, by fostering and encouraging socialization-related learning, job performance, especially that associated with technical skill knowledge, may be enhanced.

The relationship between curiosity and job performance appears to be meaningful as well. Since the patterns of correlations between all but one of the cognitive curiosity measures and both job performance dimensions in this study reach statistical significance, there is empirical support that Cognitive Curiosity also makes a contribution to job performance in general. Conversely, the low negative relationship between the Sensation Seeking scales of curiosity and Technical Job Performance provide empirical support that, at least in the mature growth stage service organizations in this research, sensation-seeking induced work behaviors may not be particularly helpful in realizing higher levels of job performance.

There was further investigation of the possible curiosity-socialization-related learning-job performance relationship in this study. Three theoretical models were examined that explored the possibility that curiosity may indeed have a causal influence on job performance. Model 1 (Figure 5) represented solely an indirect causal effect of curiosity on job performance; Model 2 (Figure 6) also included a separate direct causal path from curiosity to job performance. The fit of Model 2 was more statistically significant. Thus, curiosity has both a direct and an indirect causal path to total job performance (in Model 3, i.e., Figure 7, curiosity had only an indirect effect on Technical and Interpersonal Job Performance).

Consequently, curiosity has both a direct and indirect causal influence on job performance. The mediational effect of socialization-related learning between curiosity and job performance (the indirect causal influence of curiosity) was expected due to support in the literature. Curiosity has been noted a primary motivator and director of learning (e.g., Berlyne, 1960; Day, 1982; Loewenstein, 1994; Vidler, 1974) and socialization-related learning has an important influence on task mastery and ultimately job performance (Kozlowski, 1995; Ostroff & Kozlowski, 1992). Cognitive Curiosity's direct causal influence on total job performance, as determined by this study, was more than expected mainly because of the lack of support in the literature. Nevertheless, Cognitive Curiosity appears to directly influence job performance through perhaps motivating and directing information-seeking behaviors which result in demonstrable workplace learning and knowledge, and increased levels of job performance. Cognitive Curiosity, on the other hand, also

indirectly influences job performance through motivating and directing the learning associated with the socialization process, a primary source of employee information. In conclusion, Cognitive Curiosity seems to be a reflection, at least in part, of the importance of learning in the acquisition of job knowledge. Without adult curiosity and the information-seeking behaviors it induces, workplace learning and competent job performance will be less assured, and the work organization may suffer.

Recommendations for Future Research

Since the results of this research should only be generalized to a similar population, more research is needed with different adult populations to validate the results of this study. For instance, "need to know" occupations (e.g., military; computer programming; medicine) may reflect different levels of a desire for information or curiosity than the service-industry occupations in this study. Thus, a test of generalizability would be to determine if curiosity had similar influences on socialization-related learning and job performance in diverse need to know work populations.

The results of this research indicates that curiosity is not a unitary construct. Byman (1993), who favored a three-factor model, claimed it was "only tentative and calls for another independent sample to be verified" (p. 158). For the sake of parsimony, conceptual clarity, and research utility, the two-factor model was favored in this study. As in the Byman study, a confirmatory factor analysis of this study's results would be the next logical step to test the curiosity two-factor model's statistical fit in order to afford further clarity about the nature of the curiosity construct.

Further research is needed to more clearly understand the role of Berlyne's (1960) collative motivational variables (i.e., complexity, uncertainty, surprisingness, conflict, contradiction, etc.) in socialization-related learning. According to Berlyne, these variables all stimulate states of curiosity; it would be beneficial to understand which of these motivational stimuli has the most meaningful relationship with socialization-related learning and to what degree. This kind of information would be especially important to adult educators, trainers, HRD directors, and the like because it is widely accepted that stimulating curiosity motivates a greater depth of learning (e.g., Berlyne, 1978; Sonnenberg & Goldberg, 1992; Vidler, 1974). If cognitive curiosity was fostered in classroom exercises, training sessions, and in organizations that wish to create a learning environment, by how much and in what way would the learning increase? What effects would the learning fostered in this curious environment have on the desired outcomes of many learning endeavors (e.g., task performance), successful employee retention, organizational adaptability, etc.? Answering questions such as these would be

especially relevant when considering that all organizations must learn, change, and adapt to survive.

Another promising area of research would be to investigate Sensation-Seeking behaviors in the workplace. It would be interesting to determine what role this kind of curiosity plays in inducing or perhaps deterring workplace learning behaviors in many other diverse organizations outside the service industry. Further, it might be of interest to compare levels of sensation-seeking behaviors between similar organizations in various stages of the business growth cycle: Would new organizations, as predicted by Hall and Goodale (1986), have a greater need for high-sensation seekers than a mature organization? What implications would this information have for making employee selection and retention decisions, and for designing training programs?

Finally, Bjorck-Akesson (cf. Berliner & Calfee, 1996) claimed sensation seeking or the preference for arousal should be encouraged in children's classroom endeavors. She found that sensation seeking is positively related to affirmative attitudes about working in small groups and toward challenges and complexity in school learning. Research could be carried out in structured and unstructured (where there is likely to be more open discussion and learner decision-making) adult classroom situations, like that in a training session, to determine if her findings are generalizable to adults.

Recommendations for Adult Learning Theory

Tough (1969) claimed curiosity satisfaction was the second most cited reason for participating in adult learning projects. Kidd (1973) recommended that adult educators should try to rekindle the lost curiosity of our youth. Rossing and Long (1981) discovered that adult curiosity was highly related to the perceived value of the learning endeavor. Byman (1993) confirmed the multidimensional nature of adult curiosity, while Cavaliere (1996) claimed that as a result of failure, adult learners were driven by curiosity to solve a problem.

It seems clear that researchers acknowledge that curiosity plays some role in adult learning, yet little effort has been made to incorporate curiosity into existing adult learning theory. Knowles' (1990) Andragogical Model deserves special note. In his 1990 book, Knowles includes as his sixth assumption underlying the Andragogical Model, the notion that intrinsic and extrinsic motivators are important considerations for adult learning. He believed that internal motivators were the most potent.

Curiosity, too, is an internal learning motivator. Perhaps the importance and relevance of the Andragogical Model could be clarified by including curiosity in it. The empirical findings of

this research suggest that curiosity plays a role in informal workplace learning, an important adult learning area. In addition, much prior research has determined that curiosity motivates and directs learning in general; it would seem appropriate to include curiosity in further discussions of adult learning in general, and the Andragogical Model in particular.

Conclusions

The findings of this study suggested that adult curiosity has a direct influence on both the learning associated with socialization process and job performance. Curiosity, a primary motivator and director of learning, thus should be an important consideration for adult educators and HRD directors alike. Stimulating curiosity in training endeavors may facilitate the necessary acquisition and application of learning by increasing learner arousal and promoting deeper exploration of workplace problems. Including curiosity, too, in adult learning theory building may be appropriate as it is an important component of adult learning.

HRD directors, whose primary responsibility is to manage organizational learning in order to improve employee productivity (Gilley & Egglund, 1989), can benefit from the knowledge that curiosity is important in workplace learning. By fostering a workplace environment where curiosity was positively acknowledged through evaluation, career development, and reward and compensation procedures, curiosity would be promoted, learning would be increased, and the organization would benefit.

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APPENDIX A
FREQUENCY DISTRIBUTIONS

Table A.1Frequency Distribution for Vocation (N = 233)

	Count	Percent
Counselor	5	2.15
Customer Service Manager	14	6.01
Administrative Aide	26	11.16
Graphic Editor	7	3.00
Lawyer	1	.43
Manager	31	13.31
Office Manager	1	.43
Printer Operator	2	.86
Salesperson	2	.86
Sales Consultant	4	1.71
Service Representative	115	49.36
Technician	11	4.72
Technical Editor	1	.43
Writer Editor	12	5.15

APPENDIX B
CORRELATION MATRICES

Table B.1Workplace Adaptation Questionnaire Correlation Matrix

	JK1	JK2	JK3	JK4	JK5	JK6	JK7	JK8	AC1	AC2
JK1	--									
JK2	53	--								
JK3	51	59	--							
JK4	48	49	54	--						
JK5	53	43	44	51	--					
JK6	51	44	28	31	48	--				
JK7	43	52	39	39	41	40	--			
JK8	35	41	47	28	27	29	47	--		
AC1	10	23	17	25	13	16	25	39	--	
AC2	18	28	22	24	11	17	20	32	66	--
AC3	14	23	19	20	16	18	21	34	47	69
AC4	23	25	26	27	27	34	27	36	49	55
AC5	31	36	40	36	26	27	37	49	50	41
ER1	11	18	30	20	20	06	12	32	26	24
ER2	23	28	34	24	24	15	24	32	29	24
ER3	16	22	26	23	21	13	22	32	25	29
ER4	21	22	18	17	13	13	24	29	22	31
ER5	17	22	19	21	07	13	20	36	25	32
SLS1	04	07	13	05*	01*	04	05	28	21	29
SLS2	16	17	04	05	08	16	02	24	20	27
SLS3	18	17	13	03	14	26	05	30	26	33
SLS4	12	23	19	11	07	11	13	42	31	33

Table B.1 Continued

Workplace Adaptation Questionnaire Correlation Matrix

	AC3	AC4	AC5	ER1	ER2	ER3	ER4	ER5	SLS1	SLS2
JK1										
JK2										
JK3										
JK4										
JK5										
JK6										
JK7										
JK8										
AC1										
AC2										
AC3	--									
AC4	55	--								
AC5	37	49	--							
ER1	25	27	41	--						
ER2	19	25	51	63	--					
ER3	25	28	42	59	65	--				
ER4	31	22	38	50	59	60	--			
ER5	32	32	38	43	34	44	61	--		
SLS1	37	26	13	24	14	09	21	23	--	
SLS2	29	19	05	03	10	03	06	12	51	--
SLS3	35	30	13	08	07	04	01*	11	47	69
SLS4	39	34	18	17	11	14	20	19	61	47

Table B.1 Continued

Workplace Adaptation Questionnaire Correlation Matrix

_____ SLS3 SLS4

JK1

JK2

JK3

JK4

JK5

JK6

JK7

JK8

AC1

AC2

AC3

AC4

AC5

ER1

ER2

ER3

ER4

ER5

SLS1

SLS2

SLS3 --

SLS4 41 --

Note. Decimal points omitted. * = negative correlation.

APPENDIX C
RESEARCH INSTRUMENTS

Melbourne Curiosity Inventory-Trait Form

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel.

There are no right or wrong answers.
Do not spend too much time on any statement but give the answer which seems to describe how you generally feel.

1=Almost never 2=Sometimes 3=Often 4=Almost always

-
- | | | | | |
|---|---|---|---|---|
| 1. I think learning "about things" is interesting and exciting | 1 | 2 | 3 | 4 |
| 2. I am curious about things..... | 1 | 2 | 3 | 4 |
| 3. I enjoy taking things apart to "see what makes them tick"..... | 1 | 2 | 3 | 4 |
| 4. I feel involved in what I do..... | 1 | 2 | 3 | 4 |
| 5. My spare time is filled with interesting activities..... | 1 | 2 | 3 | 4 |
| 6. I like to try to solve problems that puzzle me..... | 1 | 2 | 3 | 4 |
| 7. I want to probe deeply into things..... | 1 | 2 | 3 | 4 |
| 8. I enjoy exploring new places..... | 1 | 2 | 3 | 4 |
| 9. I feel active..... | 1 | 2 | 3 | 4 |
| 10. New situations capture my attention..... | 1 | 2 | 3 | 4 |
| 11. I feel inquisitive..... | 1 | 2 | 3 | 4 |
| 12. I feel like asking questions about what is happening..... | 1 | 2 | 3 | 4 |
| 13. The prospect of learning new things excites me..... | 1 | 2 | 3 | 4 |
| 14. I feel like searching for answers..... | 1 | 2 | 3 | 4 |
| 15. I feel absorbed in things I do..... | 1 | 2 | 3 | 4 |
| 16. I like speculating about things..... | 1 | 2 | 3 | 4 |
| 17. I like to experience new sensations..... | 1 | 2 | 3 | 4 |
| 18. I feel interested in things..... | 1 | 2 | 3 | 4 |
| 19. I like to enquire about things I don't understand..... | 1 | 2 | 3 | 4 |
| 20. I feel like seeking things out..... | 1 | 2 | 3 | 4 |

Melbourne Curiosity Inventory-State Form

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *feel* right now, that is, *at this moment*.

There are no right or wrong answers.
Do not spend too much time on any statement but give the answer which seems to describe how you generally feel.

1=Almost never 2=Sometimes 3=Often 4=Almost always

-
- | | | | | |
|---|---|---|---|---|
| 1. I want to know more..... | 1 | 2 | 3 | 4 |
| 2. I feel curious about what is happening..... | 1 | 2 | 3 | 4 |
| 3. I am feeling puzzled..... | 1 | 2 | 3 | 4 |
| 4. I want things to make sense..... | 1 | 2 | 3 | 4 |
| 5. I am intrigued by what is happening..... | 1 | 2 | 3 | 4 |
| 6. I want to probe deeply into things..... | 1 | 2 | 3 | 4 |
| 7. I am speculating about what is happening..... | 1 | 2 | 3 | 4 |
| 8. My curiosity is aroused..... | 1 | 2 | 3 | 4 |
| 9. I feel interested in things..... | 1 | 2 | 3 | 4 |
| 10. I feel inquisitive..... | 1 | 2 | 3 | 4 |
| 11. I feel like asking questions about what is happening..... | 1 | 2 | 3 | 4 |
| 12. Things feel incomplete..... | 1 | 2 | 3 | 4 |
| 13. I feel like seeking things out..... | 1 | 2 | 3 | 4 |
| 14. I feel like searching for answers..... | 1 | 2 | 3 | 4 |
| 15. I feel absorbed in what I am doing..... | 1 | 2 | 3 | 4 |
| 16. I want to explore possibilities..... | 1 | 2 | 3 | 4 |
| 17. My interest has been captured..... | 1 | 2 | 3 | 4 |
| 18. I feel involved in what I am doing..... | 1 | 2 | 3 | 4 |
| 19. I want more information..... | 1 | 2 | 3 | 4 |
| 20. I want to enquire further..... | 1 | 2 | 3 | 4 |

Novelty Experiencing Scale

Instructions: Listed below are a series of statements that describe things you might do or experiences you might have. To the left of each statement you are to indicate, by circling Like or Dislike, whether you like or dislike the activity described by the statement. Work rapidly and give your first impression.

- | | | | |
|------|---------|-----|--|
| Like | Dislike | 1. | Exploring the ruins of an old city in Mexico |
| Like | Dislike | 2. | Thinking about why people behave the way they do |
| Like | Dislike | 3. | Letting myself go in fantasy before I go asleep |
| Like | Dislike | 4. | Finding out how a carburetor on a car works |
| Like | Dislike | 5. | Being on a raft in the middle of the Colorado River |
| Like | Dislike | 6. | Knowing why politicians act the way they do |
| Like | Dislike | 7. | Losing myself in daydreams when I am bored with what is going on |
| Like | Dislike | 8. | Finding out the meaning of words I don't know |
| Like | Dislike | 9. | Riding on a sled in Alaska pulled by huskies |
| Like | Dislike | 10. | Trying to figure out the meaning of unusual statements |
| Like | Dislike | 11. | Letting myself experience new and unusual feelings |
| Like | Dislike | 12. | Learning about a subject I don't know much about |
| Like | Dislike | 13. | Scuba diving in the Bahamas |
| Like | Dislike | 14. | Thinking a lot about a new idea |
| Like | Dislike | 15. | Watching a red rose turn blue before my eyes |
| Like | Dislike | 16. | Learning new facts about World War II |
| Like | Dislike | 17. | Being at the top of a roller coaster ready to go down |
| Like | Dislike | 18. | Thinking of different ways to explain the same thing |

Like	Dislike	19.	Looking through a blue bottle and seeing people in a dark restaurant
Like	Dislike	20.	Understanding how a computer works
Like	Dislike	21.	Sleeping out under pine trees and stars
Like	Dislike	22.	Thinking about unusual events or happenings
Like	Dislike	23.	Having an unusual dream in which I swam underwater for hours
Like	Dislike	24.	Visiting a factory to see how paper is made
Like	Dislike	25.	Watching a colorful bullfight in Spain
Like	Dislike	26.	Figuring out the shortest distance from one city to another
Like	Dislike	27.	Having a vivid dream with strange colors and sounds
Like	Dislike	28.	Figuring out how a light meter works
Like	Dislike	29.	Going on a safari in Africa to hunt lions
Like	Dislike	30.	Analyzing my own dreams
Like	Dislike	31.	Having a dream in which I lived in England in an old, haunted castle
Like	Dislike	32.	Seeing a glass blowing exhibition and listening to an explanation
Like	Dislike	33.	Orbiting the Earth in a spaceship
Like	Dislike	34.	Figuring out why I did something
Like	Dislike	35.	Seeing a duck with the head of a cat
Like	Dislike	36.	Reading the <u>World Almanac</u>
Like	Dislike	37.	Skiing down a high slope in the Alps
Like	Dislike	38.	Analyzing my own feelings and reactions
Like	Dislike	39.	Having a dream in which I seemed to be flying
Like	Dislike	40.	Planning moves in checkers or chess
Like	Dislike	41.	Climbing to the top of a high rugged mountain
Like	Dislike	42.	Thinking about ideas that conflict with each other

- | | | | |
|------|---------|-----|---|
| Like | Dislike | 43. | Dreaming that I was lying on the beach with the waves washing over me |
| Like | Dislike | 44. | Discovering a difficult word in a crossword puzzle |
| Like | Dislike | 45. | Riding the rapids in a swift moving stream |
| Like | Dislike | 46. | Listening to a lecture or talk that makes me think afterwards |
| Like | Dislike | 47. | Letting my body totally relax and seeing what I feel |
| Like | Dislike | 48. | Solving a problem involving numbers or figures |
| Like | Dislike | 49. | Walking into an old deserted house at midnight |
| Like | Dislike | 50. | Reading books on subjects that stimulate me to think |
| Like | Dislike | 51. | Feeling chills run all over my body |
| Like | Dislike | 52. | Figuring out how much it would cost to construct a building |
| Like | Dislike | 53. | Driving a sports car in the Indianapolis 500 |
| Like | Dislike | 54. | Seeing movies after which I think about something differently |
| Like | Dislike | 55. | Having my feelings change from moment to moment |
| Like | Dislike | 56. | Finding out how to unlock the two pieces of a wire puzzle |
| Like | Dislike | 57. | Diving from a board 50 feet above the water |
| Like | Dislike | 58. | Discussing unusual ideas |
| Like | Dislike | 59. | Having a strange new feeling as I awake in the morning |
| Like | Dislike | 60. | Discovering the villain in a detective story before he is revealed |
| Like | Dislike | 61. | Riding a wild horse in a rodeo |
| Like | Dislike | 62. | Reading articles in the newspaper that provoke my thought |
| Like | Dislike | 63. | Experiencing abrupt changes in my moods |
| Like | Dislike | 64. | Learning how to put a watch together |

- | | | | |
|------|---------|-----|--|
| Like | Dislike | 65. | Steering a sled down a steep hill covered with trees |
| Like | Dislike | 66. | Thinking about why the world is in the shape it is |
| Like | Dislike | 67. | Experiencing my feelings intensely |
| Like | Dislike | 68. | Putting together a complicated picture puzzle |
| Like | Dislike | 69. | Walking across a swinging bridge over a deep canyon |
| Like | Dislike | 70. | Analyzing a theory to see if it is a good one |
| Like | Dislike | 71. | Suddenly feeling happy for no reason at all |
| Like | Dislike | 72. | Reading a book entitled <u>How Things Work</u> |
| Like | Dislike | 73. | Swinging on a vine across a river filled with snakes |
| Like | Dislike | 74. | Figuring out why some event happened the way it did |
| Like | Dislike | 75. | Focusing inside on the flow of my feelings |
| Like | Dislike | 76. | Figuring out how many bricks it would take to construct a fireplace |
| Like | Dislike | 77. | Camping out in a wilderness location |
| Like | Dislike | 78. | Starting off with a new idea and seeing the new ones suggested by the original one |
| Like | Dislike | 79. | Having a vivid and unusual daydream as I am riding along |
| Like | Dislike | 80. | Learning how to make pottery |

**SELF-ANALYSIS QUESTIONNAIRE
STPI FORM X-1**

NAME: _____

SEX: M ___ F ___

DATE: _____

DIRECTIONS: A number of statements that people use to describe themselves are given below. Read each statement and then blacken the appropriate space on the answer sheet to indicate how you feel *right* now. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your *present feelings* best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel like exploring my environment	1	2	3	4
3. I am furious	1	2	3	4
4. I am tense	1	2	3	4
5. I feel curious	1	2	3	4
6. I feel like banging on the table	1	2	3	4
7. I feel at ease	1	2	3	4
8. I feel interested	1	2	3	4
9. I feel angry	1	2	3	4
10. I am presently worrying over possible misfortune	1	2	3	4
11. I feel inquisitive	1	2	3	4
12. I feel like yelling at somebody	1	2	3	4
13. I feel nervous	1	2	3	4
14. I am in a questioning mood	1	2	3	4
15. I feel like breaking things	1	2	3	4
16. I am jittery	1	2	3	4
17. I feel stimulated	1	2	3	4
18. I am mad	1	2	3	4
19. I am relaxed	1	2	3	4
20. I feel mentally active	1	2	3	4
21. I feel irritated	1	2	3	4
22. I am worried	1	2	3	4
23. I feel bored	1	2	3	4

24. I feel like hitting someone	1	2	3	4
25. I feel steady	1	2	3	4
26. I feel eager	1	2	3	4
27. I am burned up	1	2	3	4
28. I feel frightened	1	2	3	4
29. I feel disinterested	1	2	3	4
30. I feel like swearing	1	2	3	4

**SELF-ANALYSIS QUESTIONNAIRE
STPI FORM X-2**

NAME: _____

SEX: M ___ F ___

DATE: _____

DIRECTIONS: A number of statements that people use to describe themselves are given below. Read each statement and then blacken the appropriate space on the answer sheet to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you *generally* feel.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
31. I am a steady person	1	2	3	4
32. I feel like exploring my environment	1	2	3	4
33. I am quick tempered	1	2	3	4
34. I feel satisfied with myself	1	2	3	4
35. I feel curious	1	2	3	4
36. I have a fiery temper	1	2	3	4
37. I feel nervous and restless	1	2	3	4
38. I feel interested	1	2	3	4
39. I am a hotheaded person	1	2	3	4
40. I wish I could be happy as others seem to be	1	2	3	4
41. I feel inquisitive	1	2	3	4
42. I get angry when I'm slowed down by others mistakes	1	2	3	4
43. I feel like a failure	1	2	3	4
44. I feel eager	1	2	3	4
45. I feel annoyed when I am not given recognition for doing good work	1	2	3	4
46. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4
47. I am in a questioning mood	1	2	3	4
48. I fly off the handle	1	2	3	4
49. I feel secure	1	2	3	4
50. I feel stimulated	1	2	3	4
51. When I get mad, I say nasty things	1	2	3	4
52. I lack self confidence	1	2	3	4

53. I feel disinterested	1	2	3	4
54. It makes me furious when I am criticized in front of others	1	2	3	4
55. I feel inadequate	1	2	3	4
56. I feel mentally active	1	2	3	4
57. When I get frustrated, I feel like hitting someone	1	2	3	4
58. I worry too much over something that really does not matter	1	2	3	4
59. I feel bored	1	2	3	4
60. I feel infuriated when I do a good job and get a poor evaluation	1	2	3	4

Sensation Seeking Scale-Form V

INTEREST AND PREFERENCE TEST FORM V

Directions: Each of the items below contains two choices, A and B. Please indicate **on your answer sheet** which of the choices most describes **your likes** or the way **you feel**. In some cases you may find items in which both choices describe your likes or the way you feel. Please choose the one which better describes your likes or feelings. In some cases you may find items in which you do not like either choice. In these cases mark the choice you dislike **least**.

It is important you respond to **all items** with only **one choice**, A or B. We are interested only in **your likes** or **feelings**, not in how others feel about these things or how one is supposed to feel. There are no right or wrong answers as in other kinds of tests. Be frank and give your honest appraisal of yourself.

1. A. I like "wild" parties.
B. I prefer quiet parties with good conversation.
2. A. There are some movies I enjoy seeing a second or even a third time.
B. I can't stand watching a movie that I've seen before.
3. A. I often wish I could be a mountain climber.
B. I can't understand people who risk their necks climbing mountains.
4. A. I dislike all body odors.
B. I like some of the earthy body smells.
5. A. I get bored seeing the same old faces.
B. I like the comfortable familiarity of everyday friends.
6. A. I like to explore a strange city or section of town by myself, even if it means getting lost.
B. I prefer a guide when I am in a place I don't know well.
7. A. I dislike people who do or say things just to shock or upset others.
B. When you can predict almost everything a person will do and say he or she must be a bore.

8. A. I usually don't enjoy a movie or play where I can predict what will happen in advance.
B. I don't mind watching a movie or play where I can predict what will happen in advance.
9. A. I have tried marijuana or would like to.
B. I would never smoke marijuana.
10. A. I would not like to try any drug which might produce strange and dangerous effects on me.
B. I would like to try some of the new drugs that produce hallucinations.
11. A. A sensible person avoids activities that are dangerous.
B. I sometimes like to do things that are a little frightening.
12. A. I dislike "swingers."
B. I enjoy the company of real "swingers."
13. A. I find that stimulants make me uncomfortable.
B. I often get high (drinking liquor or smoking marijuana).
14. A. I like to try new foods that I have never tasted before.
B. I order the dishes with which I am familiar, so as to avoid disappointment and unpleasantness.
15. A. I enjoy looking at home movies or travel slides.
B. Looking at someone's home movies or travel slides bores me tremendously.
16. A. I would like to take up the sport of water-skiing.
B. I would not like to take up water-skiing.
17. A. I would like to try surf-board riding.
B. I would not like to try surf-board riding.
18. A. I would like to take off on a trip with no pre-planned or definite routes, or timetable.
B. When I go on a trip I like to plan my route and timetable fairly carefully.
19. A. I prefer the "down-to-earth" kinds of people as friends.
B. I would like to make friend in some of the "far-out" groups like artists or "hippies."

20. A. I would not like to learn to fly an airplane.
B. I would like to learn to fly an airplane.
21. A. I prefer the surface of the water to the depths.
B. I would like to go scuba diving.
22. A. I would like to meet some persons who are homosexual (men or women).
B. I stay away from anyone I suspect of being "queer."
23. A. I would like to try parachute jumping.
B. I would never want to try jumping out of a plane with or without a parachute.
24. A. I prefer friends who are excitedly unpredictable.
B. I prefer friends who are reliable and predictable.
25. A. I am not interested in experience for its own sake.
B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional or illegal.
26. A. The essence of good art is in its clarity, symmetry of form and harmony of colors.
B. I often find beauty in the "clashing" colors and irregular forms of modern painting.
27. A. I enjoy spending time in the familiar surroundings of home.
B. I get very restless if I have to stay around home for any length of time.
28. A. I like to dive off the high board.
B. I don't like the feeling I get standing on the high board (or I don't go near it at all).
29. A. I like to date members of the opposite sex who are physically exciting.
B. I like to date members of the opposite sex who share my values.
30. A. Heavy drinking usually ruins a party because some people get loud and boisterous.
B. Keeping the drinks full is the key to a good party.
31. A. The worst social sin is to be rude.
B. The worst social sin is to be a bore.

32. A. A person should have considerable sexual experience before marriage.
B. It's better if two married persons begin their sexual experience with each other.
33. A. Even if I had the money I would not care to associate with flighty persons like those in the "jet set."
B. I would conceive of myself seeking pleasure around the world with the "jet set."
34. A. I like people who are sharp and witty even if they do sometimes insult others.
B. I dislike people who have their fun at the expense of hurting the feelings of others.
35. A. There is altogether too much portrayal of sex in the movies.
B. I enjoy watching many of the "sexy" scenes in movies.
36. A. I feel best after taking a couple of drinks.
B. Something is wrong with people who need liquor to feel good.
37. A. People should dress according to some standards of taste, neatness, and style.
B. People should dress in individual ways even if the effects are sometimes strange.
38. A. Sailing long distances in small sailing crafts is foolhardy.
B. I would like to sail a long distance in a small but seaworthy sailing craft.
39. A. I have no patience with dull or boring persons.
B. I find something interesting in almost every person I talk with.
40. A. Skiing fast down a high mountain slope is a good way to end up on crutches.
B. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

Sensation Seeking Scale-Form V

Answer Sheet

Circle one answer per question only. Please complete all questions.

- | | | | | | |
|-----|---|---|-----|---|---|
| 1. | A | B | 21. | A | B |
| 2. | A | B | 22. | A | B |
| 3. | A | B | 23. | A | B |
| 4. | A | B | 24. | A | B |
| 5. | A | B | 25. | A | B |
| 6. | A | B | 26. | A | B |
| 7. | A | B | 27. | A | B |
| 8. | A | B | 28. | A | B |
| 9. | A | B | 29. | A | B |
| 10. | A | B | 30. | A | B |
| 11. | A | B | 31. | A | B |
| 12. | A | B | 32. | A | B |
| 13. | A | B | 33. | A | B |
| 14. | A | B | 34. | A | B |
| 15. | A | B | 35. | A | B |
| 16. | A | B | 36. | A | B |
| 17. | A | B | 37. | A | B |
| 18. | A | B | 38. | A | B |
| 19. | A | B | 39. | A | B |
| 20. | A | B | 40. | A | B |

Workplace Adaptation Questionnaire

Please rate each item below according to the following scale:
1-Strongly disagree 2-disagree 3-neither agree nor disagree 4-agree
5-strongly agree

- _____ 1. I can complete most of my tasks without assistance.
- _____ 2. I know how to perform my job in this organization.
- _____ 3. I know the tasks I must perform on my job.
- _____ 4. I can judge which projects are really important.
- _____ 5. I know how to prioritize assignments.
- _____ 6. Overall, I am pleased with the quality of my work performance.
- _____ 7. I know the "short cuts" I can take on my job.
- _____ 8. I know what resources are available to help me do my job.
- _____ 9. I know what is really valued in my organization to get ahead.
- _____ 10. I know what the rules are for getting ahead in my organization.
- _____ 11. I know what the reward systems are for my organization.
- _____ 12. I know what the acceptable image is for my organization.
- _____ 13. I know the informal rules, policies, and procedures of my organization.
- _____ 14. I know which of my coworkers are likely to be able to answer my questions correctly.
- _____ 15. I know which of my coworkers are interested in helping me.
- _____ 16. I know which of my coworkers to go to when I want to get something done.
- _____ 17. I know which of my coworkers are respected around here.
- _____ 18. I know who has the power to get things done around here.
- _____ 19. I am satisfied with the support I have received on the job.
- _____ 20. I am satisfied with my learning experiences on the job.
- _____ 21. Generally, I have had positive learning experiences on the job.
- _____ 22. I am satisfied with the feedback I have received about my performance on the job.

Job Performance Survey

Please think carefully about each of the questions below. Circle the one appropriate number for each question which is an honest representation of your level of job performance.

1. How would you rate your overall job performance?

1 2 3 4 5 6 7 8 9 10
poor fairaverage goodvery good

2. In comparison with your peers, how would you rate your overall job performance?

1 2 3 4 5 6 7 8 9 10
poor fairaverage goodvery good

3. How would you rate your overall level of technical skill knowledge*?

1 2 3 4 5 6 7 8 9 10
poor fairaverage goodvery good

4. In comparison with your peers, how would you rate your overall level of technical skill knowledge?

1 2 3 4 5 6 7 8 9 10
poor fairaverage goodvery good

5. How would you rate your overall level of interpersonal skill knowledge**?

1 2 3 4 5 6 7 8 9 10
poor fairaverage goodvery good

6. In comparison with your peers, how would you rate your overall level of interpersonal skill knowledge?

1 2 3 4 5 6 7 8 9 10
poor fairaverage goodvery good

* technical skill knowledge is the knowledge necessary for an individual to successfully manage the required specialized or technical aspects of their job.

** interpersonal skill knowledge is the knowledge necessary for an individual to successfully manage interpersonal relations between their peers and supervisors, as well as knowledge of whom to seek for pertinent information in efforts to more efficiently complete their job tasks.

APPENDIX D

LETTERS OF CORRESPONDENCE

Center for Research in Behavioral
Medicine and Health Psychology
Department of Psychology
University of South Florida
4202 East Fowler Avenue, BEH 339
Tampa, Florida 33620-8200
(813) 974-2342
FAX (813) 974-2340

February 3, 1997

Mr. Thomas G. Reio, Jr.
2517 39th Bath St., NW APT. 101
Washington, DC 20007-1210

Dear Mr. Reio:

In response to your recent request, I am very pleased to give you permission to reproduce the State Trait Personality Inventory (STPI) for your Dissertation, entitled:

Effects of Curiosity on Socialization-Related Learning and Job Performance in Adults

It is my understanding that your research will be carried out at:

Virginia Polytechnic Institute and State University (Metropolitan Washington, DC)

Best wishes on your research project. I look forward to receiving further details about your procedures and the results of your study as such information becomes available.

Sincerely,

Charles D. Spielberger, Ph. D.
Distinguished Research Professor
Director, Center for Research in behavioral
Medicine and Health Psychology

CDS/csd

Center for Research in Behavioral
Medicine and Health Psychology
Department of Psychology
University of South Florida
4202 East Fowler Avenue, BEH 339
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February 3, 1997

Mr. Thomas G. Reio, Jr.
2517 39th Bath St., NW APT. 101
Washington, DC 20007-1210

Dear Mr. Reio:

I was pleased to learn that you are planning to use the State-Trait Personality Inventory (STPI) in your dissertation on the relation between curiosity, learning, and job performance. The original 60-item STPI, which includes 10-item scales for measuring state and trait anxiety, anger and curiosity, has been revised to incorporate our new 10-Item State and Trait Depression Scales, each with 5-item subscales for measuring Euthymia and Dysthymia (good and bad feelings).

The revised 80-item STPI Test Form and several tables that provide information about the new depression measures are enclosed. Since the revised STPI takes only three or four minutes longer to administer than the original scale, I would encourage you to consider using it in your dissertation research. If you decide to do so, and will agree to make the Test Forms available to us for item analyses and inclusion in the normative sample for the STPI Test Manual, we can make 250 copies of the revised STPI Test Form available to you gratis. The revised STPI will be published by Psychological Assessment Resources, Inc. (PAR), this summer.

I am also enclosing information about our Job Stress Survey (JSS), which might also provide information relevant to the hypothesis of your dissertation study. If this measure is of interest to you, you might consider substituting it for the Melbourne Curiosity Inventory, which was based on our State-Trait Curiosity Inventory and is highly correlated with it. In 1970 when I was associated with Florida State University, Eric Gaudry of University of Melbourne spent his sabbatical working with me. He brought back an early version of the STCI, which was then further developed by his colleagues. In a recent meeting with Gaudry, now retired, I inquired about the status of the Melbourne scale and was informed that there has been little or no work with it since the 1970's. If you are aware of more recent studies, I would greatly appreciate your calling these to my attention.

The JSS applies the state-trait distinction to the assessment of occupational stress, which is positively correlated with trait anxiety and negatively

associated with curiosity. I would expect that curiosity will have its greatest impact on adult learning in the workplace for individuals who have average or lower T-anxiety and job stress scores, but persons with very low scores on these measures might also do more poorly. They lack the discipline to focus their curiosity on productive activities and are therefore lacking in what Daniel Burlyne referred to as "specific curiosity". I am enclosing reprints of several studies that develop this point more fully.

From the information provided above, it will be evident that I find your proposed dissertation to be of considerable interest. Please share this letter with Professor Wiswell and discuss with him the possibility of using the expanded STPI in your study. If you or he have any questions about the revised STPI or the JSS on which I can be of further assistance, don't hesitate to write or give me a call me.

Sincerely,

Charles D. Spielberger, Ph.D.
Distinguished Research Professor
Director, Center for Research in Behavioral
Medicine and Health Psychology
EMAIL ADDRESS: <spielber@luna.cas.usf.edu>

VITA

Thomas G. Reio, Jr. received a Bachelor of Science in Horticulture from the University of Maryland in 1979. In 1992, he earned a Master of Business Administration degree from Averett College in Danville, Virginia. In 1994, he received a Certificate of Advanced Graduate Studies in Adult and Continuing Education from Virginia Polytechnic Institute and State University. He earned a Ph.D. in Adult and Continuing Education from Virginia Polytechnic Institute and State University in 1997.

Tom served as a Branch Manager, Sales Manager, and Operations Manager in the service industry for many years. During this time, he has earned professional certification in both horticulture and agronomy and has taught a number of certification courses as well. He has also been a part-time Horticulture instructor at Prince George's Community College since 1994. In addition, he has been active in organizational instructional design and development as a corporate Training Director for the past seven years. He has won a number of awards for his efforts.

Tom has presented at a number of regional, national, and international professional conferences on topics related to his research. He hopes to continue pursuing his research interests at a local university.

Tom was born on December 19, 1955 and was raised on a tobacco farm in southern Maryland. He has three children, Stephanie, Brooke, and Dillon and loves to learn.

