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The Use of Mental Imagery in the Simulated Employment Interview Situation

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Abstract

In this study, interviewees in the training group were instructed to use mental imagery techniques in a simulated employment interview. Results indicated that the subjects who used mental imagery had higher performance in the interview and lower perceived stress than the subjects who did not use mental imagery. Mental imagery did not have a significant effect upon perceptions of self-efficacy. Mental imagery ability had a positive effect on perceived usefulness of mental imagery while controllability and vividness did not. Subjects did indicate positive perceptions of the mental imagery intervention and a willingness to use mental imagery again in the future. The personality variable, “conscientiousness”, had a significant effect in the mental imagery performance relationship.

The use of mental imagery in the simulated employment interview situation

Mental imagery, which has also been referred to as visualization, can be defined as the internal re-creation within one's thoughts of what is, or could be, an external experience (Anderson, 1997; Anthony *et al.*, 1993; Finke, 1989). The experience of mental imagery is similar to vivid daydreaming but is much more purposeful and directed. The individual mentally re-creates scenarios and, within these scenarios, visualizes effective performance and a positive outcome. Ideally, the correct or appropriate behaviors are practiced mentally in a fashion similar to the actual physical behaviors.

Mental imagery has been commonly used among Olympic athletes and has been a popular technique in the field of sport psychology. For example, McCaffrey and Orlick (1989) found that top professional golfers use mental imagery on a daily basis to supplement their training regimen. Mitch Kupchak, former star of the Washington Bullets of the National Basketball Association, credits the majority of his success as a pro basketball player to the use of visualization (Kellner, 1979). Feltz and Landers (1983), in a meta-analysis of sixty studies from the sport psychology literature, found that mental imagery positively affected performance with the effects being greater when the tasks had a greater cognitive element.

Researchers have also found positive effects of mental imagery in dancers (Hanrahan and Vergeer, 2000/2001). A study of synchronized skaters participating in an imagery training that incorporated both cognitive and motivational imagery, found that skaters increased their use of cognitive specific and cognitive general imagery after the training (Cumming and Ste-Marie, 2001). And, mental imagery has been found to have a positive effect on performance in an individual's visual art involvement (Morrison and Wallace, 2001).

The examples of golf, basketball, dance, and art illustrate the important effects mental imagery can have on performance. In sport psychology, imagery is often used in combination with relaxation or meditation in order to alter the state of consciousness. In this state of increased alpha activity, the right hemisphere of the brain, which is supposedly superior on tasks involving spatioperceptual ability such as visual imagery, seems to be more active than the left (Springer and Deutsch, 1982).

Besides having positive effects on endurance, strength, aim, and precision in the sports and arts arenas, mental imagery can also improve motor learning in rehabilitative settings (Warner and McNeill, 1988). For example, in a randomized controlled experiment, elderly women who practiced balancing using mental imagery along with physical practice showed greater balance improvements than those who participated in only physical practice (Linden *et al.*, 1989).

Another study found evidence that mental imagery may improve motor function after a stroke (Page *et al.*, 2001).

Interestingly, studies have shown that during mental imagery activations occur at the cortical level and in the musculature that is imagined being used. For example, researchers found the same type of activity in the motor execution cortical areas when subjects imagined finger

movements versus when they physically performed the movements (Breitling *et al.*, 1986).

Electromyographic (EMG) activity, cerebral blood flow, and cortical motor evoked potentials have shown that the neuromotor pathways imagined being used are actually being used and that metabolic activity of neurons is increased during mental imagery as if the activity were actually being performed (Bakker *et al.*, 1996; Livesay and Samra, 1998; Roth *et al.*, 1996). Researchers have also indicated that mental imagery can lead to plastic changes in the motor cortex area of the brain (Page *et al.*, 2001).

Researchers are also exploring the effects of mental imagery and its application to the field of business. For example, Anthony *et al.* (1993) proposed the use of visualization to facilitate long-range strategic planning. They advocated visualizing future business scenarios to make them more real and to increase the sense of urgency for considering organizational change.

Alder (1991) discussed the use of visualization to harness one's inner powers to achieve career success, and Maltz (1969) has described this success effect as psycho-cybernetics. The theory is that positive experiences, real or imagined, act to program one's mind toward an expectation of success. This positive expectation translates into a self-fulfilling prophecy as one thinks and behaves in a manner that facilitates success. After Rosenthal (1963) discovered the experimenter effect in a research project, he began to study self-fulfilling prophecies in the classroom along with Jacobson (Rosenthal and Jacobson, 1968). They discovered that teachers' expectations of their students could influence the students' performance. Research has shown that self-fulfilling prophecies exist regardless of whether the prophecies have a base in facts or are deliberately falsified.

Researchers have studied the effects of mental imagery in organizations in various areas such as entrepreneurship, (Neck *et al.*, 1999), performance appraisal outcomes (Neck *et al.*, 1995) and team performance (Manz and Neck, 1995). They have proposed that mental imagery is a component of the thought self-leadership (TSL) framework (Neck and Manz, 1992). This framework is built upon the self-leadership literature (Manz and Sims, 1980). TSL is the “process of influencing or leading oneself through the purposeful control of one's thoughts” (Neck *et al.*, 1999, p. 381). They propose mental imagery is one of the primary ways individuals have to control and influence their own behavior through imagining themselves successfully completing a task before they attempt the task.

Larsson (1987) found that a program of mental training could be implemented successfully in a large organization. Two hundred and fourteen Swedish military cadets participated in a mental training program, which included imagery rehearsal, relaxation, and meditation. The mental training group performed at a significantly higher level than the control group in task examinations and mental tests. It is also interesting to note that the cadets were trained by their platoon officers who were first trained by a specialist, the author of the study. In the training, the officers were given tape-recorded programs directing the subjects to visualize both the general scenery and the task behavior. The platoon officers did not have any formal psychological educational background. This suggests that the elements of mental imagery are not overly complex and difficult to apply.

Although researchers are examining mental imagery in business applications, one important area that still deserves attention is the employment interview. The interview is still the primary selection tool (Eder and Harris, 1999), and applicant performance in the interview is of crucial

importance to the interviewee. Poor interview performance diminishes one's job acquisition possibilities and can limit one's career success. Despite the established programs of research in both mental imagery and interviews, a keyword search of over twenty databases did not find any empirical research integrating the two areas. The purpose of this paper is to examine the use of mental imagery in the employment interview context.

Performance

Mental imagery may affect performance through a transfer of training effect and a generalized practice effect (Hodes, 1991). Hodes (1991) found that instructional methods that used high imagery resulted in increased transfer of training through greater learning of procedural information. Perhaps this increased transfer of training occurs because the new behaviors are recalled more easily after they have been clearly visualized or practiced mentally. As the new interview skills or behaviors are repeatedly rehearsed mentally, new behavioral patterns may be ingrained in one's memory, similar to what might occur with physical practice (Kellner, 1979). The increased transfer of training due to mental imagery and the generalized practice effect may both contribute toward improved performance.

Mental imagery may also improve performance, because it helps employees to visualize a positive interview experience, which ultimately may affect the decision-trajectory match.

Decision-trajectory match is the perceived similarity between a decision maker's conception of the future state to which the decision maker aspires (the decision's "trajectory image") and the decision maker's current image of a project (Beach and Mitchell, 1990). Dunegan (1993) used image theory to propose how framing affects the decisionmaker's outcome images. Image theory holds that positive frames and automatic decision processing encourage the decision maker to

perceive decision outcomes positively. This, in turn, leads to feelings that current and trajectory images will be compatible. (This assumes that the trajectory image is positive.) Image theory studies have found the current/trajectory match to be closer when information frame and goal were consistent (London *et al.*, 1997). Mental imagery could give prospective interviewees the positive information frame and consistent goal they need. In consideration of improved transfer of training, potential practice effects, the positive frame, and the consistent goal, we expect mental imagery to positively affect interview performance:

H1.=Interviewees who use mental imagery for interviews will achieve higher interview performance levels than interviewees who do not use mental imagery for interviews.

Self-efficacy

According to Bandura's (1986) social cognitive theory, self-efficacy beliefs or beliefs about one's abilities are good predictors of subsequent performance. Self-efficacy refers to the judgments people make about their ability to execute specific actions. Bandura (1977, p. 193) defines an efficacy expectation as "... the conviction that one can successfully execute the behavior required to produce the outcomes". This expectation is a perceived one. Although it may be based on past performance, it is not true that if individuals have a high level of self-efficacy on a task that they will be able to perform the task. They may believe that they can perform the task and in reality may not be able to do so. However, it is the belief that they can successfully perform a task that is supposed to have an influence on an individual's behavior. This perceived self-efficacy will also determine the amount of effort people put into a task and how persistent they will be at the task (Bandura, 1977), and there is also evidence that self-efficacy in a task is related to self-regulation, which involves setting realistic, attainable goals, using appropriate goal-attainment

strategies, and monitoring goal-attainment success (Schnoll and Zimmerman, 2001). Researchers have confirmed that self-efficacy beliefs or confidence in writing ability is related to writing competence, writing apprehension, and the perceived value of writing (Meier *et al.*, 1984; Pajares and Johnson, 1994).

It appears that mental imagery may influence one's self-efficacy in the tasks or situations that one visualizes. Some researchers have hypothesized that the mind does not clearly differentiate between an actual experience or an imagined experience (Maltz, 1969). If we think of one's self-efficacy judgments as being the additive result of a lifetime of positive and negative experiences, then there may be a cumulative effect upon self-efficacy as one visualizes task experiences. In other words, as one visualizes successful interview performances, interview self-efficacy judgments might be expected to increase.

A study on climbing found that those using mental imagery reported higher levels of technical climbing self-efficacy than did controls not enrolled in the intervention (Jones *et al.*, 2002). Cervone (1989) also found evidence that the visualization/self-efficacy linkage occurs. Cervone had subjects visualize factors that would either impair or facilitate performance in two problem solving tasks. The subjects who envisioned factors that would facilitate performance made higher self-efficacy judgments than did the subjects who imaged factors that would inhibit performance. Similarly, positive visualization of the interview encounter may also lead to higher self-efficacy judgments related to the interview task. This leads to the following hypothesis:

H2.=Using mental imagery to practice successful interview performance will lead to greater interview self-efficacy judgments.

Perceived stress

An employment interview can be a stressful experience (Thompson, 1989), and mental imagery holds some promise for reducing the inhibiting effects of this stress. In the aforementioned study on climbing, results show that climbers who used mental imagery reported lower stress levels than those who did not use mental imagery (Jones *et al.*, 2002). Cocude (1988) found that mental imagery reduced strong, negative emotional reactions. By first experiencing the object in the mind, negative affective reactions were reduced.

Kohen (1986) also found that mental imagery led to reduced anxiety and fear, and an increased sense of control in emergency situations. And, Rivkin and Taylor (1999) found that when dealing with stressful events visualization participants had greater positive affect and higher levels of planned and active coping. Consistent with these results, it is possible that interviewees using a positive imagery method may gain a more positive perspective of the stress-inducing interview situation. By visualizing that which is feared, interviewees may be more able to cope with the future interview event. Based on previous research, it is proposed that mental imagery will lead to lower perceived stress in the interview situation. Thus, the following is hypothesized:

H3.—Individuals who use mental imagery for interviews will have lower perceived stress than will individuals who do not use mental imagery.

Mental imagery ability, vividness, and controllability

Research indicates the need to take into account the ability of the person to perform mental imagery when looking at the usefulness of mental imagery. Ferraro (1993) conducted an experiment with 200 subjects that demonstrated the usage of mental imagery and discussed the

importance of individual differences and even gender differences in imagery ability. Another study demonstrated that cognitive style is important individual difference variable affecting mental imagery ability (O'Halloran and Gauvin, 1994). Specifically, imagic style subjects demonstrated superior mental imagery ability compared to verbal thinkers. One article demonstrated that frequency of dream recall was related to mental imagery ability, while another article indicated that those who report stronger tendencies to form mental images are better able to spell words backwards (Walczyk and Taylor, 2000; Okada *et al.*, 2000). Differences in imagery ability do appear to exist, and we would expect those individuals who report stronger mental imagery ability to perceive greater usefulness in the process. Thus:*H4.*=Imagery ability will be positively associated with the perceived usefulness of mental imagery. Vividness and controllability of mental imagery have been found to be important factors in the effectiveness of mental imagery ability. For example, Ayres *et al.* (1999) found that imagery vividness and control were linked to reductions in public speaking apprehension and negative thinking. Sommer (1978) has hypothesized that individuals vary on a continuum between being verbalizers and visualizers. Pure verbalizers rarely report having imagery and seldom dream in pictures. In contrast, visualizers report experiencing imagery in their waking and sleeping states and often have strong emotional reactions to these images as well. For example, when they are asked to imagine fearful scenes, they show much greater physiological responses (Sommer, 1978).

In regards to imagery vividness, Marks (1977) found that vividness moderated learning on a rotary pursuit task. Those with greater vividness performed at a higher level. Others have also stressed the importance of imagery vividness in the use of visualization techniques (e.g. Anthony *et al.*, 1993; Ayres *et al.*, 1999). Vividness has also been found to moderate performance of

individual's visual art ability and their creative mental synthesis task (Morrison and Wallace, 2001). And, Jones *et al.* (2002) examined the effects of vividness and perceived value of the imagery training during rock climbing. In alignment with past research, we expect that high vividness of mental imagery will be related to the perceived usefulness of the imagery.

Specifically:*H5.*=Vividness of imagery will be positively associated with the perceived usefulness of mental imagery.It is expected that visualizers will have more vivid imagery and will be able to control their imagery better than verbalizers. Controllability is concerned with the ability to manipulate the images that are visualized. Controllability may be very important in moderating the effects of imagery; one may require control over the visualization experience to create and manipulate the desired images. Turner *et al.* (1982) found that persons with high control of imagery outperformed those with low control on a pursuit-tracking task. We expect the ability to control mental imagery will be related to the perceived usefulness of mental imagery. Specifically:

H6.=Controllability of imagery will be positively associated with the perceived usefulness of mental imagery.

Conscientiousness

In the last two decades there appears to have been a resurgence of research on personality in the workplace. For example, personality measure usage for management selection increased from 12 percent to 37 percent from 1984 to 1989 in the UK (Robertson and Kinder, 1993). The five-factor model of personality (FFM) includes extraversion, agreeableness, conscientiousness, emotional stability, and openness. Also known as the big five model of personality, it is a widely used taxonomy of personality that has been shown to be valid across many situations and

cultures (Barrick and Mount, 1991; Costa and McCrae, 1995; Dalton and Wilson, 2000; Digman, 1990; Goldberg, 1992, Salgado, 1997). Conscientiousness, has three components: achievement orientation (hardworking and persistent), dependability (responsible and careful), and orderliness (planful and organized) (Judge *et al.*, 1999).

The individual difference variable of Conscientiousness was used in this research, because it appears to be the most relevant factor to examine in relationship to mental imagery. Past research has demonstrated that Conscientiousness, showed consistent relationships with the following job performance criteria: job proficiency, training proficiency and personnel data across five occupational groups (Mount and Barrick, 1998). Conscientiousness has a volitional component dealing with self-motivation, efficaciousness, and will to achieve, as well as a dependability component dealing with cautiousness, reliability, and organization. Numerous studies have found conscientiousness to be positively related to job performance across situations. Conscientious individuals are thought to be more perseverant and more committed to goals, which can ultimately affect performance. Judge and Ilies (2002) performed a meta-analytic study examining personality and performance motivation and found that conscientiousness was one of the strongest and most consistent correlates of performance motivation when goal-setting, expectancy, and self-efficacy theories of performance motivation were examined. Based on past research findings that indicate the importance of conscientiousness in relation to performance, we hypothesize the following:

H7.=Individuals who score high on conscientiousness will have a stronger relationship between mental imagery and performance.

Methodology

Subjects

Subjects ($n=99$) were students (juniors and seniors) in management classes in a large state university in the south-eastern USA. Students were told that mock interviews were being given for a management trainee position and that these interviews were being given to further their interview skills and for research purposes. And, students were informed that they would also receive up to five bonus points towards an exam if they participated and focused on the task given. The five bonus points were the equivalent of 1 percent added onto the students' final grades, and all participating students appeared to take the interview seriously, thus earning the five bonus points. The study was approved by the Internal Review Board at a large south-eastern university and students signed the required informed consent forms. After the study, when the students were debriefed on the purpose of the study, many commented that it had been enjoyable and beneficial.

A total of four interviewers were involved in the study. The interviewers were four instructors in management at a large public university in the south-eastern USA. All of the instructors had previous business experience, were familiar with the literature involved in the study, and were trained by the lead researcher conducting the study. During the training the interviewers, who were blind to the assignment of the subjects-control group versus mental imagery trained group, were instructed to be as objective as possible and to use the structured interview questions provided and not to engage the interviewees in side conversations. The procedure was thoroughly discussed so that everyone understood the complete nature of the project and the importance of following the structured interview format. Two of the interviewers were female

and two were male. Subjects were randomly assigned to one of the four interviewers, and the ratings from the four interviewers were not significantly different.

Procedure

On the day of the interview, posters were placed in strategic locations to direct students to the appropriate locations. Instruction sheets for both the training and control groups were placed on a table in random order to be picked up by the students. The training group received a four-page protocol, which was one more page than the controls due to a mental imagery instruction page. After picking up instruction booklets interviewees were directed to the practice rooms. For added realism, both the practice sessions and the interview sessions were held in rooms normally used for on-campus interviews. The subjects started the practice session with page one, which consisted of an explanation of the type of job (i.e. management trainee) and then ten typical interview questions as delineated in Bolles (2002). Sample questions were: “What can you do for us?” and “What is your greatest weakness?”. Interviewees were instructed to write out answers to these questions.

After completing page one, the training group went to page two, which had the instructions for mental imagery. Training group interviewees were first given a definition of mental imagery and then instructed to relax, take a few deep breaths and visualize an interviewer asking the ten questions from page one. The training group interviewees were instructed to visualize feeling confident and in control as the interview progressed to a successful outcome. As Martin and Hall (1995) have suggested, subjects were instructed to use both process and outcome imagery. They were to envision the interview process proceeding successfully and the interview concluding with a job offer (i.e. a positive outcome). This phase lasted ten to twenty minutes.

After this, the training group went to page three, which had questions measuring perceived stress, visualization ability, visualization control, vividness of visualization, and the perceived usefulness and willingness to try mental imagery in the future. The control group had the same packet minus the items related to mental imagery. When the process was completed the interviewees were instructed to hand their protocol sheets to the interview administrator and wait for the next available interviewer.

Interviewees were asked a subset of five questions from the ten practice interview questions. The questions for the interview were obtained and modified from the perennial job seeker's manual, "What color is my parachute", by Bolles (2002). The questions were as follows: "Tell me about yourself"; "What are your major strengths?"; "What is your greatest weakness?"; "What accomplishment gave you the greatest satisfaction?"; and "How does your education relate to this job?". To ensure standardized treatment of the subjects, the trained interviewers were instructed to ask the questions in the same order, not to ask follow-up questions, and to have a firm, but friendly demeanor. Immediately after each interview was completed, interviewers rated their willingness to hire the interviewee.

After the interviewees completed the interview, they exited and the administrator handed them a questionnaire. At this time subjects answered questions regarding post-interview arousal, openness to experience, and conscientiousness, respectively. The latter two items were reserved until after the interview in order to avoid consciously interfering with the applicant's state of mind prior to the interview.

Measures

All items were scored on a Likert scale (1-5), with 1 indicating, “strongly disagree”, and 5 indicating “strongly agree”.

Self-efficacy. Self-efficacy was a four-item measure modified from Riggs *et al.* (1994). The following is a sample item: “I am very good at interviewing”.

Imagery vividness and control. The items for imagery vividness and imagery control were single-item measures adapted from Richardson (1969). The items were as follows: “My visualization was clear and vivid” and “I was able to control the visualization”.

Openness to experience. The measure for “openness to experience” was a four-item measure developed using the adjective list in McCrae and John (1992). An example of a representative item is: “I prefer trying new activities rather than sticking to a routine”.

Conscientiousness. The measure for conscientiousness was a two-item measure and also developed based on the adjective list in McCrae and John (1992). The items were as follows: “I tend to let things pile up rather than take the time to get organized”, and “Most people would probably not consider me a workaholic”.

Perceived stress. The measure for perceived stress was a three-item measure developed by the authors. A representative item is as follows: “At this time I feel nervous”.

Mental imagery ability. There were two items measuring mental imagery ability developed by the authors. One of the items states: “I was able to visualize myself in the interview situation”.

Interviewee performance. Interviewee performance was operationalized as willingness to hire the interviewee. Two items developed by the authors measured performance. The following is a sample item: “I would recommend hiring this person”.

Perceived usefulness of mental imagery. A single-item measure was also developed by the authors to measure perceived usefulness of mental imagery: “The mental imagery seemed useful to me”.

Results

ANCOVA analysis was run to explore the covariates of the relationship between mental imagery and performance (Table I). Regression analysis was performed to investigate predictors of perceived usefulness of mental imagery (Table II). *t*-tests were performed to look at the differences between the trained group and the control group (Table III).

In support of *H1*, the use of mental imagery did lead to higher interview performance as can be seen in the ANCOVA analysis in Table I. The mental imagery group had a mean of 3.81 and the control group had a mean of 3.49 (with 5=strongly agree and 1=strongly disagree to “I would hire this candidate”) (see Table III).

Regarding *H2*, pre-interview (and post-mental imagery) perceptions of interview self-efficacy were not significant although the mental imagery group had a slightly higher mean of 3.41 and the control group had a mean of 3.27 (see Table III).

In support of *H3*, pre-interview (but post-imagery) perceptions of stress were significantly lower for the mental imagery group (average 3.09) than for the control group (average 3.40) on five-

point scales (see Table III). Post-interview perceptions of perceived stress were not significantly different for the two groups.

The only significant predictor of the perceived usefulness of mental imagery was the ability to visualize oneself (*H4*) in the interview situation. In the same regression analysis, imagery vividness (*H5*) and imagery control (*H6*) did not predict the perceived usefulness of mental imagery (see Table II). *H7* was supported and conscientiousness, was a significant covariate in the mental imagery-interview performance relationship (see Table I).

Some individuals may not find mental imagery useful (Sommer, 1978). For this reason, the training group also answered questions regarding their perceptions of the usefulness of mental imagery and of their inclination to use mental imagery in the future. The mean value for the usefulness of mental imagery was 3.71 (on a five-point scale, 3=neutral) (see Table III). The mean value for inclination to try mental imagery again in the future was 4.14 (on a five-point scale, 3=neutral) (see Table III).

t-tests were performed to determine that the mental imagery group's ratings on inclination to try mental imagery again were significantly different than neutral ($t=6.45, p<0.001$). Ratings on the usefulness of mental imagery were also significantly different than neutral ($t=3.68, p=0.003$).

Discussion

This study had several interesting results. Probably foremost was that support was found for mental imagery leading to increased performance in the interview context. Consistent with past research in other areas that demonstrates the usefulness of mental imagery, it appears that applying mental imagery in the interview setting is also beneficial. We would expect this effect

to be useful for both employees and managers in other areas such as performance appraisals, training modules and corporate meetings. Future research should continue to investigate this effect in other areas.

Conscientiousness was found to positively affect the relationship between mental imagery and performance. This is consistent with past research finding conscientiousness to be positively related to job performance. Conscientious individuals appear to be better able to implement the training from mental imagery. This may be due to the three components comprising conscientiousness; achievement orientation, dependability, and orderliness. These individuals may be more self-motivated to utilize mental imagery, more persistent at incorporating the training into their interview performance, and better able to apply their organizational abilities helping them to focus their mental imagery practice and performance.

People reporting stronger mental imagery ability did find mental imagery to be more useful than those who did not report strong ability in this area. This is consistent with research on visual and verbal thinkers (Sommer, 1978). We would expect visualizers to have stronger mental imagery ability and therefore to find the practice useful. There may be other individual differences that affect the perceived usefulness of mental imagery and future research should investigate this area of mental imagery.

One of the surprising results was the finding that vividness and controllability were not associated with the perceived usefulness of mental imagery results. This could be construed as evidence that the use of mental imagery is useful for individuals regardless of whether or not the imagery experienced is vivid or is totally under the control of the visualizer. However, the general ability to visualize oneself in the interview situation was related to perceived usefulness

of mental imagery. This lends mixed support for Sommer's (1978) thoughts on visualizers and verbalizers. The ability to visualize, regardless of vividness and controllability, was the deciding factor in one's determination as to the usefulness of mental rehearsal.

Interview self-efficacy was higher for the mental imagery group but not significantly. One reason for the non-significance may be that interviewees only had one mental imagery session. Many have posited that it generally takes several mental imagery sessions for the effects to take a firm hold in one's consciousness (Martin and Hall, 1995). When studying self-efficacy it may be important to look at what happens if the individual experiences a negative outcome after utilizing mental imagery. The strength of the efficacy expectation indicates how firmly the individual believes in their efficacy. Those with strong expectations will persist at the task despite disconfirming evidence. Disconfirming evidence, such as a failed attempt at a task, can easily persuade those with a weak expectancy to not attempt the task again (Bandura, 1977).

Self-esteem may be an important factor when exploring the relationship between self-efficacy and mental imagery. Self-esteem has been found to be an important moderator of reactions to negative prophecies (Hurley, 1997). In a study of students that explored the effects of self-esteem on negative feedback Brockner *et al.* (1987) found that those with high self-esteem performed much better than those with low self-esteem after both had received negative feedback. No difference was found between the groups following positive feedback.

People told they will not succeed may see this as a threat to their self-esteem and change their behavior in order to succeed. Threats to a person's self-esteem often lead to the person taking action to restore one's self-esteem. One may take a negative prophecy about one's performance as a threat to one's self-esteem and try to improve one's performance in order to eliminate the threat

to self-esteem. This appears especially true for people with high self-esteem (Shrauger and Kelly, 1981). People with high self-esteem have been found to persist longer at tasks than people with low self-esteem (Perez, 1973; Shrauger and Sorman, 1977). High self-esteem also seems to cause people to overestimate their likelihood of success (Baumeister and Scher, 1988). People with high self-esteem may see more long-term positive effects of mental imagery than people with low self-esteem. Self-esteem may strengthen the effects of self-mental imagery on performance.

Limitations

It may be considered a limitation that the subjects were asked some of the same questions in the interview as were prepared for in the practice period. In defense of this strategy, it is a relatively common practice in interviews for general questions to be asked (Bolles, 2002). Of course, there will be organization and interviewer specific questions as well.

However, if the interviewee is well prepared, then he or she should be able to anticipate many of the specific and general questions that will be posed. Given that the interviewee implements solid preparation for the interview, the limitation of similar mental imagery and interview questions does not seem overly problematic.

Another potential limitation is the operationalization of interviewee performance, which was based on two items developed by the authors to assess the interviewer's willingness to hire the candidate. In this study, having the interviewer determine whether or not they would hire the candidate was somewhat subjective, however in most real-world employment interview situations hiring decisions do typically involve a subjective component. We did take precautions

to decrease bias in the interviews by utilizing a structured interview format and training the interviewers to be as objective as possible.

Some may question if research about sports performance in which the outcome is largely through purely personal endeavor over a certain time period can be related to employment interviews that are a more interactive experience. However, we would argue that sports can be interactive as well. Sports such as tennis, soccer, and basketball have many unknown variables in them and even individual sports such as running may have unknown variables such as the weather and the condition of the track. This is an attempt to bring research from another area in to the management field, and we believe that it is appropriate to apply some of the research on mental imagery techniques to the employment interview situation and other business situations as well.

In addition, one may argue that mental imagery does not prepare an individual to be sufficiently flexible in the event of unexpected or unanticipated questions or situations in the interview.

However, the same argument could be made in sport situations. While mental imagery may not prepare an individual for all potential situations, ideally it would generally have a positive effect on the interviewee through such variables as lower perceived stress.

Managerial implications

Although the use of mental imagery has gained acceptability in the area of athletics, it does not appear to have been as widely practiced in the business realm. Interviewees who use mental imagery may be able to gain a distinct competitive advantage over their counterparts who do not use mental imagery. In today's competitive job market any type of edge may make the difference between landing the position that one desires or having to select a second or third option.

Another interesting result was that the trained group found the mental imagery session useful and would be inclined to try it again. This could lead one to the conclusion that many job seekers would be willing to give mental imagery a try if only they were introduced to the technique. For example, university placement offices could introduce job-seeking candidates to the techniques of mental imagery and place their clientele at a distinct advantage. From this study it appears that, if used, mental imagery techniques may be well received by individuals within a business setting.

Furthermore, the finding that mental imagery can positively affect perceived stress is useful to interviewees. Researchers have found that too much stress can have negative effects on performance (Allen *et al.*, 1982) and, avoiding excess stress is especially important in stressful situations such as interviews. Nervousness can cause mental blocks and these blockages may result in inadequate or inappropriate responses to interviewer questioning.

Conclusion

In summary, it is the authors' supposition that mental imagery might be used whenever one has an important performance to enact, not just in interviews. It is important to note that mental imagery has particular advantages. It is relatively inexpensive and easy to use. The imager simply rehearses the behavior in his/her mind. The imager is also able to practice in an environment that is relatively risk-free. One is not required to practice the new behaviors in the actual setting, where mistakes can be costly, but is allowed to develop the skill privately. It is with these advantages in mind that the authors call for more research to determine the specific circumstances in which mental imagery will be most effective. As Maltz (1969) said "seeing is believing".

References

- Alder, H. (1991), "Seeing is being: the natural way to success", *Management Decision*, Vol. 29 No.1, pp.25-30.
- Allen, R.D., Hitt, M.A., Greer, C.R. (1982), "Occupational stress and perceived organizational effectiveness in formal groups: an examination of stress level and stress type", *Personnel Psychology*, No.Summer, pp.359-70.
- Anderson, A. (1997), "Learning strategies in physical education: self-talk, imagery, and goal-setting", *The Journal of Physical Education, Recreation and Dance*, Vol. 68 No.1, pp.30.
- Anthony, W.P., Bennett, R.H. III, Maddox, E.N., Wheatley, W.J. (1993), "Picturing the future: using mental imagery to enrich strategic environmental assessment", *Academy of Management Executive*, Vol. 7 No.2, pp.43-56.
- Ayres, J., Hopf, T., Edwards, P.A. (1999), "Vividness and control: factors in the effectiveness of performance visualization?", *Communication Education*, Vol. 48 No.4, pp.287.
- Bakker, F.C., Boschker, M., Chung, J. (1996), "Changes in muscular activity while imagining weightlifting using stimulus or response propositions", *Journal of Sport Exercise Psychology*, Vol. 18 pp.313-24.
- Bandura, A. (1977), "Self-efficacy: towards a unifying theory of behavioral change", *Psychological Review*, Vol. 84 pp.191-215.
- Bandura, A. (1986), "The explanatory and predictive scope of self-efficacy theory", *Journal of Social and Clinical Psychology*, Vol. 4 pp.359-73.
- Barrick, M.R., Mount, M.K. (1991), "The big five personality dimensions and of performance: a meta-analysis", *Personnel Psychology*, Vol. 44 pp.1-26.
- Baumeister, R.F., Scher, S.J. (1988), "Self-defeating behavior patterns among normal individuals: review and analysis of common self-destructive tendencies", *Psychological Bulletin*, Vol. 104 pp.3-22.
- Beach, L.R., Mitchell, T.R. (1990), "Image theory: a behavioral theory of decision making in organizations", in Staw, B., Cummings, L.L. (Eds), *Research in Organizational Behavior*, JAI Press, Greenwich, CT, Vol. Vol. 12 pp.141.
- Bolles, R.N. (2002), *What Color is Your Parachute? 2003: A Practical Manual for Job-hunters and Career-changers*, Speed Press, Berkeley, CA, .
- Breitling, D., Guenther, W., Rondont, P. (1986), "Motor responses measured by electrical activity mapping", *Behavioral Neuroscience*, Vol. 100 pp.104-16.

- Brockner, J., Derr, W.R., Laing, W.N. (1987), "Self-esteem and reactions to negative feedback: Toward greater generalizability", *Journal of Research in Personality*, Vol. 21 pp.318-33.
- Cervone, D. (1989), "Effects of envisioning future activities on self-efficacy judgments and motivation: an availability heuristic interpretation", *Cognitive Therapy and Research*, Vol. 13 No.3, pp.247-61.
- Cocude, M. (1988), "Generating and maintaining visual images: the incidence of individual and stimulus characteristics", in Denis, M., Engelkamp, J. (Eds), *Cognitive and Neuropsychological Approaches to Mental Imagery*, Martinus Nijhoff Publishers, Dordrecht, pp.213-22.
- Costa, P.T., McCrae, R.R. (1995), "Domains and facets: hierarchical personality assessment using the revised NEO personality inventory", *Journal of Personality Assessment*, Vol. 64 pp.21-50.
- Cumming, J.L., Ste-Marie, D.M. (2001), "The cognitive and motivational effects of imagery training: a matter of perspective", *Sport-Psychologist*, Vol. 15 No.3, pp.276-88.
- Dalton, M., Wilson, M. (2000), "The relationship of the five-factor model of personality to job performance for a group of Middle Eastern expatriate managers", *Journal of Cross-Cultural Psychology*, Vol. 31 pp.250-8.
- Digman, J.M. (1990), "Personality structure: emergence of the five-factor model", *Annual Review of Psychology*, Vol. 41 pp.417-40.
- Dunegan, K.J. (1993), "Framing, cognitive modes, and image theory: toward an understanding of a glass half full", *Journal of Applied Psychology*, Vol. 78 pp.491-503.
- Eder, R.W., Harris, M.M. (1999), "Employment interview research: historical update and introduction", in Eder, R.W., Harris, M.M. (Eds), *The Employment Interview Handbook*, SAGE Publications, Inc., Thousand Oaks, CA, pp.1-27.
- Feltz, D.L., Landers, D.M. (1983), "The effects of mental practice on motor skill learning and performance: a meta-analysis", *Journal of Sport Psychology*, Vol. 5 pp.25-57.
- Ferraro, F.R. (1993), "Large-scale demonstration experiment of mental imagery ability", *Perceptual and Motor Skills*, Vol. 96 No.3, pp.1089-90.
- Finke, R.A. (1989), *Principles of Mental Imagery*, MIT Press, Cambridge, MA, .
- Goldberg, L.R. (1992), "The development of markers for the big-five factor structure", *Psychological Assessment*, Vol. 4 pp.26-42.
- Hanrahan, C., Vergeer, I. (2000/2001), "Multiple uses of mental imagery by professional modern dancers", *Imagination, Cognition and Personality*, Vol. 20 No.3, pp.231-55.

- Hodes, C.L. (1991), "The effectiveness of mental imagery and visual illustrations: a comparison of two instructional variables", *Journal of Research and Development in Education*, Vol. 26 pp.46-56.
- Hurley, A.E. (1997), "The effects of self-esteem and source credibility on self-denying prophecies", *Journal of Psychology*, Vol. 131 No.6, pp.1-11.
- Jones, M.V., Mace, R.D., Bray, S.R., MacRae, A.W., Stockbridge, C. (2002), "The impact of motivational imagery on the emotional state and self-efficacy levels of novice climbers", *Journal of Sport Behavior*, Vol. 25 No.1, pp.57-73.
- Judge, T.A., Ilies, R. (2002), "Relationship of personality to performance motivation: a meta-analytic review", *Journal of Applied Psychology*, Vol. 87 No.4, pp.797-807.
- Judge, T.A., Higgins, C.A., Thoresen, C.J., Barrick, M.R. (1999), "The big five personality traits, general mental ability, and career success across the life span", *Personnel Psychology*, Vol. 52 No.3, pp.621.
- Kellner, S. (1979), *Taking It to the Limit with Basketball Cybernetics*, Durite Printing, New York, NY, .
- Kohen, D.P. (1986), "Applications of relaxation/mental imagery (self-hypnosis) in pediatric emergencies", *International Journal of Clinical and Experimental Hypnosis*, Vol. 34 pp.283-329.
- Larsson, G. (1987), "Routinization of mental training in organizations: effects on performance and well-being", *Journal of Applied Psychology*, Vol. 72 No.1, pp.88-96.
- Linden, C.A., Uhley, J.E., Smith, D. (1989), "The effects of mental practice on walking balance in an elderly population", *Occupational Therapy Journal of Research*, Vol. 9 pp.155-69.
- Livesay, J.R., Samra, M.R. (1998), "Covert neuromuscular activity of the dominant forearm during visualization of a motor task", *Perceptual Motor Skills*, Vol. 86 pp.371-4.
- London, M., Casey, J., Chatterjee, S., Hurley, A.E. (1997), "Effects of information frame, response frame, and goal on personnel decision making", *Journal of Psychology*, Vol. 131 No.2, pp.225-40.
- McCaffrey, N., Orlick, T. (1989), "Mental factors related to excellence among top professional golfers", *International Journal of Sport Psychology*, Vol. 20 pp.256-78.
- McCrae, R.R., John, O.P. (1992), "An introduction to the five-factor model and its applications", *Journal of Personality*, Vol. 60 pp.175-215.
- Maltz, M. (1969), *Psycho-Cybernetics*, Pocket Books, New York, NY, .
- Manz, C.C., Neck, C.P. (1995), "Teamthink: beyond the groupthink syndrome in self-managing work teams", *Journal of Managerial Psychology*, Vol. 10 pp.7-15.

- Manz, C.C., Sims, H.P. Jr (1980), "Self-management as a substitute for leadership: a social learning theory perspective", *Academy of Management Review*, Vol. 5 pp.361-7.
- Marks, D.F. (1977), "Imagery and consciousness: a theoretical review from an individual differences perspective", *Journal of Mental Imagery*, Vol. 2 pp.275-90.
- Martin, K.A., Hall, C.R. (1995), "Using mental imagery to enhance intrinsic motivation", *Journal of Sport and Exercise Psychology*, Vol. 17 pp.53-69.
- Meier, S., McCarthy, P.R., Schmeck, R.R. (1984), "Validity of self-efficacy as a predictor of writing performance", *Cognitive Therapy and Research*, Vol. 8 pp.107-20.
- Morrison, R.G., Wallace, B. (2001), "Imagery vividness, creativity and the visual arts", *Journal of Mental Imagery*, Vol. 25 No.3/4, pp.135-52.
- Mount, M.K., Barrick, M.R. (1998), "Five reasons why the 'big five' article has been frequently cited", *Personnel Psychology*, Vol. 51 No.4, pp.849.
- Neck, C.P., Manz, C.C. (1992), "Thought self-leadership: the influence of self-talk and mental imagery on performance", *Journal of Organizational Behavior*, Vol. 13 pp.681-99.
- Neck, C.P., Stewart, G., Manz, C.C. (1995), "Thought self-leadership as a framework for enhancing the performance of performance appraisers", *Journal of Applied Behavioral Science*, Vol. 31 pp.278-302.
- Neck, C.P., Neck, H.M., Manz, C.C., Godwin, J. (1999), "'I think I can; I think I can': a self-leadership perspective toward enhancing entrepreneur thought patterns, self-efficacy, and performance", *Journal of Managerial Psychology*, Vol. 14 No.6, pp.477-501.
- O'Halloran, A.M., Gauvin, L. (1994), "The role of preferred cognitive style in the effectiveness of imagery training", *International Journal of Sport Psychology*, Vol. 25 No.1, pp.19-31.
- Okada, H., Mastuoka, K., Hatakeyama, T. (2000), "Dream-recall frequency and waking imagery", *Perceptual and Motor Skills*, Vol. 91 No.3, pp.759.
- Page, J., Levine, P., Sisto, S.A., Johnston, M.V. (2001), "Mental practice combined with physical practice for upper-limb motor deficit in subacute stroke", *Physical Therapy*, Vol. 81 No.8, pp.1455.
- Pajares, F., Johnson, M.J. (1994), "Confidence and competence in writing: the role of writing self-efficacy, outcome expectancy, and apprehension", *Research in the Teaching of English*, Vol. 28 pp.313-31.
- Perez, R.C. (1973), "The effect of experimentally induced failure, self-esteem and sex on cognitive differentiation", *Journal of Abnormal Psychology*, Vol. 81 pp.74-9.

- Richardson, A. (1969), *Mental Imagery*, Springer, New York, NY, .
- Riggs, M.L., Warka, J., Babasa, B., Betancourt, R., Hooker, S. (1994), "Development and validation of self-efficacy and outcome expectancy scales for job-related applications", *Educational and Psychological Measurement*, Vol. 54 No.3, pp.793-802.
- Rivkin, I.D., Taylor, S.E. (1999), "The effect of mental simulation on coping with controllable stressful events", *Personality and Social Psychology Bulletin*, Vol. 25 No.12, pp.1451.
- Robertson, I.T., Kinder, A. (1993), "Personality and job competencies: the criterion-related validity of some personality variables", *Journal of Occupational and Organization Psychology*, Vol. 66 pp.225-44.
- Rosenthal, R. (1963), "On the social psychology of the psychological experiment: the experimenter's hypothesis as unintended determinant of experimental results", *American Scientist*, Vol. 51 pp.268-83.
- Rosenthal, R., Jacobson, L. (1968), *Pygmalion in Classroom and Pupils' Intellectual Development*, Holt, Rinehart and Winston, New York, NY, .
- Roth, M., Decety, J., Raybaudi, M. (1996), "Possible involvement of the primary motor cortex in mentally simulated movement: a functional magnetic resonance imaging study", *Neuroreport*, Vol. 17 pp.1280-4.
- Salgado, J.F. (1997), "The five factor model of personality and job performance in the European Community", *Journal of Applied Psychology*, Vol. 82 pp.30-43.
- Schnoll, R., Zimmerman, B.J. (2001), "Self-regulation training enhances dietary self-efficacy and dietary fiber consumption", *Journal of the American Dietetic Association*, Vol. 101 No.9, pp.1006.
- Shrauger, J.S., Kelly, R.J. (1981), "Self-confidence and endorsement of external evaluations", unpublished manuscript, .
- Shrauger, J.S., Sorman, P.B. (1977), "Self-evaluations, initial success and failure, and improvement as determinants of persistence", *Journal of Consulting and Clinical Psychology*, Vol. 45 pp.784-95.
- Sommer, R. (1978), *The Mind's Eye*, Delacorte Press, New York, NY, .
- Springer, S.P., Deutsch, G. (1982), *Left Brain, Right Brain*, Freeman, San Francisco, CA, .
- Thompson, A. (1989), "Customer contact personnel: using interview techniques to select for adaptability in service employees", *Journal of Services Marketing*, Vol. 3 No.1, pp.57-65.
- Turner, P.E., Kohl, R.M., Morris, L.W. (1982), "Individual differences in skilled performance following imagery of bilateral skill", *Perceptual and Motor Skills*, Vol. 55 pp.771-80.

Walczyk, J.J., Taylor, R.W. (2000), "Reverse-spelling, the VVIQ and mental imagery", *Journal of Educational Psychology*, Vol. 88 No.3, pp.537-45.

Warner, L., McNeill, M.E. (1988), "Mental imagery and its potential for physical therapy", *Physical Therapy*, Vol. 68 No.4, pp.516.

TABLE I-ANCOVA results for mental imagery effects with covariates

| Source | df | Sum of squares | Mean square | F-value | Signif. of <i>F</i> |
|-----------------------|----|----------------|-------------|---------|---------------------|
| Covariate | 3 | 6.01 | 2.00 | 1.81 | 0.151 |
| Conscientiousness | 1 | 4.99 | 4.99 | 4.50 | 0.037* |
| Mental Imagery Effect | 1 | 3.16 | 3.16 | 2.85 | 0.048* |
| Error | 94 | 104.24 | 1.11 | | |
| Total | 98 | 112.63 | 1.15 | | |

Note: * $p < 0.05$

TABLE II-Predictors of perceived usefulness of mental imagery

| Variable | β | Std err. | Beta | <i>t</i> | Sig. <i>t</i> |
|-----------------|---------|----------|-------|----------|---------------|
| Imagery ability | 0.70 | 0.14 | 0.63 | 4.90 | 0.001*** |
| Controllability | 0.12 | 0.13 | 0.13 | 0.96 | 0.34 |
| Vividness | -0.02 | 0.11 | -0.02 | -0.20 | 0.84 |

Notes: $R^2 = 0.52$, $F = 25.12$, *** $p < 0.001$

TABLE III-t-test results, means (and standard deviations) of variables

| | Trained | Control |
|---------------------------------|----------------|-------------|
| Pre-interview self-efficacy | 3.41 (0.67) | 3.27 (0.67) |
| Interview performance | 3.81 (1.05)* | 3.49 (1.08) |
| Pre-interview perceived stress | 3.09 (0.83)* | 3.40 (0.90) |
| Post-interview perceived stress | 2.88 (0.890) | 2.68 (0.88) |
| Usefulness of mental imagery | 3.71 (1.07)** | |
| Try mental imagery again | 4.14 (1.19)*** | |

Notes: Likert scale 1 to 5 with one being lowest and 5 being highest. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$