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Running Head: Intuition

Intuition as an Influence on Creative Problem-Solving:
The Effects of Intuition, Positive Affect, and Training

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Abstract

Intuition may be a critical component of creative thought. To test this hypothesis, a measure of individual differences in intuition was developed. After completing this measure, 320 undergraduates were asked to work on a domain relevant creative problem-solving task under conditions where positive and neutral affect were induced and they were exposed to one of three different types of training. It was found that intuitive people produced more creative problem solutions, but that positive affect and training offset the advantage intuitive people showed in creative problem-solving. The implications of these findings for understanding the nature of intuition, and its role in creative problem-solving, are discussed.

Intuition as an Influence on Creative Problem-Solving:
The Effects of Intuition, Positive Affect, and Training

Creative thought is a complex, elusive, construct (Mumford & Gustafson, 1988). Over the years, as we have made progress in our understanding of creative thought (e.g. Brophy, 1988; Scott, Lonergan, & Mumford, 2005; Ward, Patterson, & Sifonis, 2004), scholars have begun to ask new questions about the attributes of people that might contribute to creative problem-solving. The attributes considered in these studies have included errors (Mumford, Blair, Dailey, Leritz, & Osburn, 2006), mental models (Johnson-Laird, 1983), insight (Sternberg & Davidson, 1995), and intuition (Policastro, 1995). Although all of these attributes might influence creative problem-solving, and eventual creative achievement, intuition appears to be especially important (Bowers, 1987; Perkins, 1992).

One illustration of the potential impact of intuition on creative problem-solving and creative achievement may be found in Gardner and Nemirovsky, (1991). They conducted an in-depth case study of two emergent creators – Georg Cantor, a mathematician and Sigmund Freud, a psychologist. They found that in the identification of unconscious local coherences in complex fields, their definition of intuition was a key influence of the contributions made by both these scholars. Other investigators, including Agor (1989), Bastick (1982), and Simonton (1980), have all also argued that intuition may be integral to creative problem-solving in the arts, life sciences, and management.

Although there is reason to suspect that intuition might play a critical role in creative thought, and ultimately creative achievement, direct evidence demonstrating the impact of intuition on creative problem-solving is not available (Shirley & Langan-Fox, 1996). Moreover, the cognitive operations that make intuition possible remain unclear (Langan-Fox & Shirley,

2003; Policastro, 1995). With these points in mind, our intent in the present study was two-fold. First, we hoped to show that intuition was related to creative problem-solving. Second, we hoped to examine the mechanisms giving rise to intuition – specifically examining the role of positive affect and training.

Intuition

Intuition has been defined in different ways by various investigators (Shirley & Langan-Fox, 1996). For example, Bastrick (1982) has defined intuition as a form of foresight, or the ability to see the end in the distance, under conditions where the individual is working on a novel, complex, and uncertain task – the kind of task associated with creative thought (Mumford & Gustafson, 1988). Policastro (1995) has defined intuition as a vague anticipatory perception that orients creative work in a promising direction. Gardner and Nemirovsky (1991) see intuition as the formation of inarticulate, or unconscious, local coherences that emerge as people begin work on a creative problem.

Although these definitions of intuition differ from each other in some notable ways, three key characteristics of intuitive thought are implicit in these definitions. First, intuition involves the identification of a pattern with minimal information. Second, intuition is not necessarily subject to conscious objective analysis. Third, intuition serves to guide work on complex tasks at times inducing affect. Put more directly, intuition may be said to involve the formation of an inarticulate, unconscious, pattern that guides problem-solving and decision making on complex tasks.

When intuition is defined in this way, it becomes apparent that intuition at some level involves implicit or tacit knowledge (Baylor, 2001; Reber, 1989; Simon, 1989). In fact, studies of tacit knowledge, unconscious knowledge of underlying patterns (Reber, 1989) indicates that

tacit knowledge does give rise to intuitive behavior. Some compelling evidence pointing to the role of knowledge, albeit unconscious inarticulate knowledge, in the identification of emergent patterns may be found in work by Bowers and his colleagues (Bowers, 1987; Bowers, Farvolden, & Mermigis, 1995; Bowers, Regher, Balthazard, & Parker, 1990). In these studies people were presented with incomplete information on a series of tasks and they were asked to generate solutions. For example, recognition of an object in a picture lacking key elements, or cues, that would assist in guiding the formation of associations. In this series of studies, it was found that 1) people could detect coherences before having fully sufficient information and 2) people often formed viable hypotheses before they had acquired enough information to permit generation of the correct solution. Not only do these findings point to the relevance of unconscious pattern recognition in intuition, these studies also indicate that people display individual differences in their willingness to work with intuitions.

The existence of these individual differences in intuition point to the feasibility of developing measures of intuition. Westcott developed a measure intended to capture individual differences in intuitive ability (Westcott, 1961, 1966; Westcott & Ranzori, 1963). On this measure people were presented with 20 analogy problems where they could request additional information bearing on the problem. People differed in not only the number of correct answers, but more significantly, the number of clues requested and their confidence in their solutions. Intuitive people were held to be those who produced correct conclusions with few clues. Scores on this measure were found to evidence adequate test-retest reliability (Westcott, 1966) and construct validity with regard to performance on cognitive measures (Westcott & Ranzom, 1963). However, scores on this measure were not correlated with dispositional measures of

intuition such as those derived from the Myers-Briggs Type Indicator (Langan-Fox & Shirley, 2003).

Although Westcott's (1961, 1966) measure provides a plausible basis for measuring individual differences in intuition, this measure has been criticized (Bastick, 1982). This measure is subject to criticism because the type of problems being examined, analogy problems, have limited relevance to real-world experience – the kind of experiences held to give rise to implicit expertise and pattern recognition. Moreover, evidence is not available indicating that performance on this measure is related to creative problem-solving. Assuming that the domain relevance issue (Baer, 2003) can be addressed, one would expect that scores on the resulting measure of intuition would be related to creative problem-solving. Hence, our first hypothesis:

Hypothesis one: Scores on a domain relevant measure of intuition will be positively related to creative problem-solving performance within this domain.

Of course, creative problem-solving is a complex phenomenon in its own right. Besemer and O'Quin (1999), in their examination of the attributes of creative problem solutions, found that these solutions could be characterized in terms of three attributes – quality, originality, and elegance. Although intuition, the emergence of unconscious patterns, can be expected to be related to the production of creative solutions, intuition may be differentially related to these three elements. More specifically, if intuition represents the unconscious emergence of themes or patterns (Gardner & Nemirovsky, 1991), the tendency of people to pursue and elaborate these patterns should give rise to solutions of relatively high elegance. As a result, a second hypothesis seems indicated:

Hypothesis two: Individual differences in intuition within a domain will be positively related to the quality, originality, and elegance of solutions obtained on

domain relevant creative problem-solving tasks but intuition will be more strongly related to elegance than solution quality and originality.

Positive Affect

If intuition involves the unconscious recognition of patterns that promote creative problem-solving, individual differences in intuitive ability within a domain may not be the only variable influencing performance. In fact, one variable that might be of some importance in this regard is positive affect. Positive affect is induced through a variety of manipulations – watching films, listening to music, and the experience of success (Nummenmaa & Niemi, 2004). Isen and her colleagues (Estrada, Isen, & Young, 1994; Isen, 1993, 2001; Nygren, Isen, Taylor, & Dulin, 1996) have conducted an extensive series of investigations examining how positive affect influences creative thought and decision making. The findings obtained in these studies indicated that positive affect contributes to performance on measures of creativity such as Mednick's (1968) remote associations test. These effects, moreover, did not appear attributable to general motivational sets but instead how people go about problem-solving.

For example, Estrada, Isen, and Young (1994) induced positive affect in physicians working on a diagnosis problem by providing chocolates. Subsequent comparison of doctors who had, or had not, experienced this affect induction manipulation indicated that under conditions of positive affect physicians were less subject to decision making errors, such as anchoring, integrated different sources of information bearing on the disease more effectively, and were likely to generate correct hypotheses about the nature of the disease earlier in their problem-solving efforts.

Of course, the findings of Estrada, Isen, and Young (1994) are of interest, in part, because they suggest that positive affect may give rise to one form of intuitive behavior – early disease

recognition. In fact, Isen and Daubman (1984) and Kahn and Isen (1993) have found that under conditions of positive affect people appear to 1) formulate patterns more readily, 2) incorporate a wider range of material, and 3) recognize the similarities and differences among elements of this pattern. More rapid and effective construction of patterns attributable to positive affect should, in turn, give rise to intuitive behavior if the emergence of unconscious patterns, or themes, provides a basis for intuition.

In the context of the present study, if positive affect leads to the emergence of viable patterns, it can be expected to induce intuitive behavior and creative problem-solving. With the induction of intuitive behavior, however, underlying differences across individuals in intuitive ability will become a less important influence on performance. In contrast, intuitive ability should exert a particularly strong influence on creative problem-solving when people are working under conditions of neutral affect. These expected effects, in turn, led to our third hypothesis:

Hypothesis Three: Individual differences in intuitive ability will be more strongly related to creative problem-solving when people are working under conditions of neutral as opposed to positive affect.

Training

Positive affect, of course, is not the only situational variable that might influence the relationship between intuition and creative problem-solving. If people are more skilled in recognizing and applying intuitions, or emergent patterns, one would expect that these skill differences would moderate the relationships between intuitive grasp of a problem and subsequent creative performance. In fact, Markley (1988), Rockenstein (1988), and Wonder and

Blake (1992) have argued that training in strategies, such as relaxation and guided imagery, might contribute to the effective application of intuition in creative thought.

Of course, training likely to encourage the effective application of intuition in creative problem-solving should ultimately be guided by our understanding of the cognitive mechanisms underlying intuition (Scott, Leritz, & Mumford, 2004). At least three models have been proposed that might account for how intuition operates to influence creative problem-solving: 1) associational models, 2) mental models, 3) fit appraisals.

Simonton (1980) has argued that the basis for intuition may arise from unconscious associational mechanisms. Within this view, stimuli activate broader associational networks tied to salient, affective, events (Estes, 1991). Activation of these networks may in turn give rise to the emergence of unconscious patterns that provide a basis for intuition. Accordingly, one would expect that strategies promoting exploration and elaboration of these networks would contribute to the application of intuition in creative problem-solving. In contrast, Johnson-Laird (1983) has argued that mental models, broader schematic structures, might influence intuition and creative problem-solving. With the activation of a mental model, and perhaps analyses of this model in relation to situational constraints, patterns should be activated. Subsequent application of these patterns in creative problem-solving would give rise to intuition (Bonnerfon, 2004; Jansson, 1999; Perales, Catena, & Maldonado, 2004; Von Hecker, 2004). Finally, the degree of fit between mental models and the situation at hand might give rise to identification of congruent elements with these high fit, or congruent elements, providing a basis for the emergence of patterns and intuition (Gresov, 1989; Mockler, 2001).

Although direct empirical evidence is lacking with regard to the application of all these models in understanding the role of intuition in creative thought, all of these models appear to

provide a plausible basis that might account for the emergence of patterns and intuitive thought. More centrally, each of these models suggests strategies that might be used to enhance intuition. For example, in an associational model, a broad search should contribute to innovation, while in a fit model appraisal of element congruity to the situation at hand should prove useful. Accordingly, it seems reasonable to expect that training in effective application of these strategies will facilitate the application of intuitive ability in creative problem-solving (Scott, Leritz, & Mumford, 2004). Hence, our fourth hypothesis:

Hypothesis Four: Training application of the strategies underlying the application of emergent patterns will contribute to creative problem-solving.

The hypotheses sketched out above, in fact, point to the unique contributions of the present study. Although extant theory, and prior historical research, suggest that intuition contributes to creative problem-solving, evidence directly bearing on this proposition is not available. Moreover, it seems likely that intuition will contribute to creative problem-solving in unique ways. Specifically, intuition may be more likely to give rise to elegant as opposed to original solutions. Not only will the present study examine the effects of intuition on creative problem-solving, the basis of intuition on the emergence of patterns will be assessed through both an examination of the effects of positive affect and these alternative strategies, associational models, mental models, and fit appraisals, that might be used to account for the emergence and application of those patterns.

Method

Sample

To test these hypotheses, 320 undergraduates were recruited from introductory

psychology courses at a large southwestern university. The 126 men and 181 women (13 gender unreported) recruited to participate in this study were drawn from courses providing extra-credit for participation in experiments. Students in these classes reviewed available experiments listed on a website and selected the experiment they would participate in to receive extra-credit. The average age of sample members was 19 and most were in their sophomore year. Their academic ability, as indicated by scores on the Scholastic Aptitude Test, lay a quarter of a standard deviation above national norms for freshman entering four year institutions.

General Procedure

Participants were recruited to take part in an experiment that was purported to be a study of problem-solving. During the first hour of this three hour study, participants were asked to complete a background information form and a battery of reference measures. These individual differences measures were intended to provide a set of covariate controls to take into account other potential influences on creative problem-solving. After participants had completed the background information form, affect, either positive or neutral, was induced through music they listened to before starting work on the reference measures and other experimental tasks. After they had completed the reference measures, participants were asked to work through a series of self-report instructional exercises illustrating strategies for applying intuition in creative problem-solving based on associational models, mental models, and fit appraisals. Following training, and induction of positive affect, participants were asked to work on a task where intuition was to be assessed with respect to the decisions to be made in managing an undergraduate psychology club. These decisions, and the time taken in making these

decisions, provided the basis for identifying more and less intuitive individuals. These individuals were then asked to provide a solution to a creative problem - an idea for establishing a new club at a university. The quality, originality, and elegance of solutions to this problem provided the primary dependent variables used to assess the effects of training, intuition, and positive affect on creative problem-solving.

Reference Measures

Based on the findings of Vincent, Decker, and Mumford (2002), participants were asked to complete measures examining three cognitive capacities, divergent thinking, expertise, and intelligence, known to influence creative problem-solving. Intelligence was measured using an analogical reasoning test drawn from Ruch and Ruch (1980). This 30-item test presents a series of facts where people are asked to indicate whether conclusions drawn from these facts are true, false, or unclear. This test yields test-retest reliability coefficients in the .80s. Evidence for the validity of this test as a measure of intelligence has been provided by Ivancevich (1976) and Ruch and Ruch (1980).

Divergent thinking was measured using Guilford's (Guilford & Hoepfner, 1971) Consequences A Test. This measure of divergent thinking presents 5 questions where people are asked to list the outcomes of unlikely events (e.g. What would happen if gravity was cut in half?). When scored for fluency, or the number of responses generated, this measure yields internal consistency coefficients in the high .70s. Evidence for the construct validity of the consequences test as a measure of divergent thinking may be obtained by consulting Merrifield, Guilford, Christensen, and Frick (1962) and Vincent, Decker, and Mumford (2002).

Expertise was measured using a variation on the procedures developed by Scott, Lonergan, and Mumford (2005). More specifically, participants were presented with 10 background data questions (Mumford, Stokes, & Owens, 1990) examining participants exposure to and involvement with student clubs (e.g. How many clubs had they belonged to? How often had they resolved conflicts in student groups? How many clubs had they belonged to where they had held leadership positions?). After scaling, these questions produced an internal consistency coefficient above .80. This experiential measure was used to provide an assessment of prior exposure to the problem-solving task.

In addition to these cognitive measures, participants were also asked to complete a measure of trait-based positive affect. This measure, drawn from Watson, Clark, and Tellegen (1988), presents 20 affective descriptors (e.g. interested, excited, hostile, afraid). Participants were asked to rate, on a 5-point scale, the extent to which these words describing feelings and emotions characterized them over the past week. When scored for positive and negative affect this measure yields internal consistency coefficients in the .80s. Evidence bearing on the construct validity of this measure as an index of trait-based affect has been provided by Watson, Clark, and Tellegen (1988).

The final measure participants were asked to complete was intended to provide an overall assessment of personality. This measure, Goldberg's (1992) Unipolar Measure, provides scales for assessing neuroticism, extroversion, openness, agreeableness, and conscientiousness. This measure presents 100 self-descriptive words (e.g. active, agreeable, or energetic). People are asked to rate on a 9-point scale how accurate these words are in describing them relative to peers. The resulting scales for measuring neuroticism, extraversion, openness, agreeableness, and conscientiousness produce

internal consistency coefficients above .80. Evidence for the validity of these scales has been provided by Reysen (2005), Saucier (2002), Conway and Peneno (1999), and Becker, Billings, and Eveleth (1997).

Positive Affect

As noted earlier, intuition might also be influenced by induction of positive affect. A number of manipulations have been used to induce positive affect relative to a neutral affective state (Nummenmaa & Niemi, 2004). Although a number of manipulations for induction of positive affect are available, prior studies by Kerr, Walsh, and Marshall (2001) and Isen (1993) indicate that music can be used to induce positive affect.

Accordingly, based on the findings Silvia and Abele (2002), participants were asked to listen to one of two instrumental pieces of music, each approximately 3 minutes in length. In the positive affect condition participants were asked to listen for 3 minutes to Guaraldi's (1968) composition "Linus and Lucy". In the neutral affect condition, participants were asked to listen for 3 minutes to Moby's (1995) "Hymn". These songs were played from a laptop computer placed at the front of the room after participants had completed the background information form, but before they began work on reference measures, training, and intuition measures. It is of note that evidence for the validity of this manipulation for induction of positive and neutral affect has been provided by Silvia and Abele (2002). This manipulation occurred early in the experiment to induce a general set effect (Hodges, 2000).

Training

The training participants were asked to complete was based on strategies that have been found to contribute to application of associational models, mental models, and fit

appraisals in problem-solving and intuitive thinking (Scott, Leritz, & Mumford, 2004). Initially, a review of the literature bearing on associational models (e.g. Estes, 1991; Grim, Denis, and Kokalis, 2004; Sima, 2003; Simonton, 1980), mental models (e.g. Burns, 2005; Jonassen, 2004; Perales, Catena, & Maldonado, 2004), and fit appraisals (e.g. Agor, 1989; Bergeron, Raymond, & Rivard, 2004; Gresov, 1989; Mockler, 2001) was conducted to identify candidate strategies that would contribute to the application of each form of knowledge in intuitive thought. Based on this review, five strategies were identified by three psychologists that might contribute to the application of each form of knowledge in intuitive problem-solving. The strategies identified for applying associational models, mental models, and fit appraisals in intuitive thought are presented in Figure 1.

Insert Figure 1 About Here

After the strategies to be trained had been identified, material for training application of associational models, mental model, and fit appraisals in intuitive problem-solving was developed. The instructional material provided in all conditions was based on a self-paced format. Initially, participants were provided with a description of each strategy and how application of this strategy might contribute to problem-solving using day-to-day examples. Next, participants were presented with a series of three multiple choice questions asking when and how each of these five strategies should be applied in problem-solving. After they had answered these questions, participants were asked to

review the correct answers concerning strategy application, and the associated justifications for these answers, before moving to the third, and final, section of training.

In this final section of training, participants were asked to apply these strategies in working through a series of 15 problems involving the management of clubs in a university setting. Across these 15 problems, 3 problems were presents for each of the 5 strategies under consideration. Each problem began by presenting a one paragraph description of the problem that considered the context, setting, and nature of the problem. Subsequently, participants were presented with a potential solution to this problem that illustrated application of a particular strategy. These sample solutions described application of the strategy in the context of the problem. After reading through a summary statement describing the strategy, and a one paragraph illustration of how this strategy was to be applied in the context of the problem, participants were asked to underline the three most critical points in this solution statement. This underlining intervention was used to help insure active processing (Chi, Bassok, Lewis, Reimann, & Glaser, 1989) of the solution material provided. Figure 2 illustrates the nature of this training material for application of past experiences in each of the training conditions.

Insert Figure 2 About Here

Based on this material, a training manipulation was induced. Three groups received training – 1) one group was trained in associational model strategies, 2) one group was trained in mental model strategies, and 3) one group was trained in fit appraisal strategies. The fourth group was a no-training control group.

Intuition

Individual differences in intuitive ability were measured using a domain specific variation on Westcott's (1961) measure. On this measure, following training, all participants were asked to assume the role of an individual starting a psychology club at a university. After participants had been presented with this goal, and background information concerning the university and the psychology department, they were presented with a series of 20 decisions to be made about this club.

Each decision was to be based on a one paragraph description of the issue to be addressed. These scenarios described the context surrounding the issue, the nature of the issue, and the decision to be made. After reading through this material, participants were asked to write out a three or four line answer to the question being asked. At the time they began work, they were asked to record start times. After they had completed their answer, they were asked to record end times. Figure 3 provides an illustration of one of these decision scenarios.

Insert Figure 3 About Here

To help participants arrive at their decisions, additional resources were provided on a page following the general scenario. These additional resources provided information bearing on the decision. Participants were told that use of this additional support material was "up to them". However, if they decided to use this information, they were asked to 1) list start and finish times and 2) indicate what information helped them

make their decision. Figure 4 provides an illustration of this additional material made available to participants, in reaching their decisions.

Insert Figure 4 About Here

A panel of three psychologists reviewed each scenario. They then formulated one good, two average, and one poor response to the problem raised in the decision scenario. A judge, familiar with the scoring rules for each scenario, then appraised participants' solutions. Intuition was scored based on performance across all 20 decisions where an individual was classified as intuitive if a) they had above average standard scores for the correctness of their decisions, b) below average standard scores for the time from when they started until they finished making their decisions, and c) below average standard scores for the use of additional materials. These intuition scores had a split-half reliability of .74. Individuals were assigned to the intuitive and non-intuitive categories based on their scores on this measure through a weighted average of correct, rapid, and use of additional materials as reflected in their responses across the 20 decisions.

Creative Problem-Solving

To assess creative problem-solving, participants were asked to write a one to two page plan for establishing a new club at the university. In preparing the plans for a new club, participants were asked to describe what kind of club they would establish. They were also asked to indicate, in preparing this plan, how they would recruit members, conduct fundraising activities, and direct meetings.

These one or two page plans for a new club were presented to a panel of three psychologists – all doctoral candidates in industrial and organizational psychology. These judges were asked to rate the solutions provided to this problem for quality, originality, and elegance (Besemer & O’Quin, 1999) using a variation on consensual rating technique developed by Redmond, Mumford, and Teach (1993). Quality solutions were defined as a logical coherent plan for a club that might prove of interest to undergraduates. Original solutions were defined as unexpected surprising plans that might prove workable. Elegant solutions were defined as coherent well organized plans that would have maximal impact on the student body with minimal investment. Quality, originality, and elegance ratings were to be made on a 5-point scale. Figure 5 provides examples of solutions receiving high, medium, and low ratings of quality, originality, and elegance.

Insert Figure 5 About Here

Prior to making their evaluations of the quality, originality, and elegance of the plans provided for establishing these clubs, the 3 judges were asked to participate in a 40-hour training program. In this training, judges were familiarized with the nature of the problem-solving task and the definitions of quality, originality, and elegance to be applied in evaluating solutions. Subsequently, judges evaluated a set of sample plans selected to represent varying levels of quality, originality, and elegance. In the first set of sample products feedback was provided concerning ratings by one of the investigators. Judges then proceeded to rate a second set of sample products. They then met and discussed their ratings to clarify decision rules and resolve any discrepancies. Following

training, the interrater agreement coefficients obtained for evaluations of plan quality, originality, and elegance were .82, .81, and .75, respectively.

Analyses

To examine the effects of intuition, training, and positive affect on the quality, originality, and elegance of the plans provided for new clubs, a series of analysis of covariance tests was conducted. In these analyses, scores on the reference measures and background information form were treated as covariate controls. The independent variables examined included training condition, positive versus neutral affect, and intuitive versus non-intuitive individuals to examine the effects of these variables on the quality, originality, and elegance of solutions. It is of note that a covariate control measure was retained only if it provided a relationship significant beyond the .05 level.

Results

Quality

Table 1 presents the results obtained in the analysis of covariance examining the quality of the solutions obtained on this creative problem-solving task. As might be expected based on the findings of Vincent, Decker, and Mumford (2002), intelligence proved to be a significant ($F(1, 301) = 5.82, p \leq .05$) covariate in accounting for solution quality with more intelligent people producing higher quality plans for a new club. Openness also produced a significant ($F(1, 301) = 6.86, p \leq .01$) relationship with solution quality. In keeping with the observations of McCrae (1996), people evidencing greater openness produced higher quality solutions on the creative problem-solving task. Finally, class year produced a significant ($F(1, 301) = 4.76, p \leq .05$) relationship with older students producing somewhat higher quality solutions than younger students.

Insert Table 1 About Here

In accordance with our initial hypothesis that intuition, when assessed within domain of expertise, would be related to the production of more creative solutions, a significant ($F(1, 301) = 4.01, p \leq .05$) main effect was obtained for intuition. Intuitive people produced higher quality solutions ($M = 2.98, SE = .10$) than less intuitive people ($M = 2.74, SE = .06$). Apparently, intuition is related to the quality of the solutions obtained on creative problem-solving tasks.

A significant ($F(1, 301) = 5.31, p \leq .05$) interaction was also obtained between intuition and affect. Inspection of the relevant cell means indicated that particularly high quality solutions were obtained from intuitive individuals in the neutral affect condition ($M = 3.11, SE = .14$). However, induction of positive affect, in keeping with our earlier hypothesis, resulted in the production of solutions of higher quality for both intuitive ($M = 2.85, SE = .14$) and non-intuitive ($M = 2.89, SE = .09$) individuals than those that are low intuitives in the neutral affect condition ($M = 2.61, SE = .09$). Therefore, it would appear that induction of positive affect can offset the poor performance observed for non-intuitive individuals under conditions of neutral affect. However, induction of positive affect, perhaps by undermining critical analysis of emerging intuitions, may inhibit the production of high quality solutions by more intuitive people.

A marginally significant ($F(3, 301) = 2.31, p \leq .10$) interaction was also obtained between training condition and affect. When no training was provided and neutral affect was induced, solutions of particularly low quality ($M = 2.60, SE = .14$) were obtained.

Solutions of particularly high quality ($M = 3.09$, $SE = .16$) were obtained when no training was provided but positive affect was induced. Training in associational model strategies ($M = 2.80$, $SE = .18$), mental model strategies ($M = 2.85$, $SE = .16$), and fit appraisal strategies ($M = 2.90$, $SE = .17$) all produced better performance with respect to the quality of obtained solutions vis-à-vis the no training and neutral affect condition. These relationships held regardless of affect suggesting training may offset the debilitating effects of no training and neutral affect. Training, however, did not result in better performance than simply inducing positive affect – perhaps because training, unlike positive affect, disrupted application of familiar, preferred, problem-solving strategies.

Originality

Table 2 presents the results obtained in the analysis of covariance conducted for solution originality. Again, intelligence proved to be a significant ($F(1, 304) = 6.03$, $p \leq .05$) covariate. As might be expected, more intelligent people provided more original solutions on this creative problem-solving task. No other covariate produced significant relationships with solution originality.

 Insert Table 2 About Here

Two marginally significant interactions were obtained, however, in accounting for solution originality. One of these marginally significant ($F(1, 304) = 3.08$, $p \leq .10$) interactions occurred between intuition and affect. In keeping with the findings obtained for solution quality, solutions of particularly low originality ($M = 2.52$, $SE = .10$) were

obtained from non-intuitive individuals working under conditions of neutral affect. Solutions of particularly high originality ($M = 2.95$, $SE = .16$) were obtained from intuitive individuals working under conditions of neutral affect. More original solutions were obtained from individuals working under conditions of positive affect regardless of whether they were ($M = 2.80$, $SE = .16$) or were not ($M = 2.83$, $SE = .10$) intuitive relative to people who were not intuitive working under conditions of neutral affect. Again, however, it was found that intuitive individuals working under conditions of neutral affect produced more original solutions.

A marginally significant interaction ($F(3, 304) = 2.42$, $p \leq .10$) was also obtained between affect and training in accounting for the originality of problem solutions. Inspection of the relevant cell means indicated that solutions of low originality ($M = 2.54$, $SE = .16$) were obtained when no training was provided and people worked under conditions of neutral affect while solutions of high originality ($M = 3.10$, $SE = .18$) were obtained when no training was provided but people worked under conditions of positive affect. Again, regardless of affective condition, training in the application of associational model strategies ($M = 2.80$, $SE = .20$), mental model strategies ($M = 2.65$, $SE = .18$) and fit appraisal strategies ($M = 2.83$, $SE = .19$) resulted in solutions of originality lying between the two extremes defined by positive and neutral affect with no training. Notably, however, somewhat less original solutions were obtained for application of mental models suggesting that application of extant models may have limited the generation of more original solutions.

Elegance

Table 3 presents the results obtained with analysis of covariance conducted for solution elegance. Intelligence was the only significant ($F(1, 303) = 6.53, p \leq .01$) covariate with more intelligent people producing more elegant solutions on the creative problem-solving task. In accordance with our second hypothesis, a strong, significant ($F(1, 303) = 7.60, p \leq .01$) main effect was obtained for intuition. More intuitive individuals ($M = 2.71, SE = .10$) produced more elegant solutions than less intuitive individuals ($M = 2.40, SE = .06$).

 Insert Table 3 About Here

A marginally significant interaction ($F(3, 303) = 2.54, p \leq .10$) was also obtained between affect and training. In keeping with the findings obtained for solution quality and originality, solutions of particularly low elegance ($M = 2.31, SE = .14$) were obtained from individuals working under conditions of neutral affect with no training while solutions of much higher elegance were obtained from individuals working under conditions of positive affect with no training ($M = 2.90, SE = .16$). Again, training in strategies, regardless of affective condition, resulted in solutions of elegance lying between these extremes regardless of whether the training focused on associational model strategies ($M = 2.53, SE = .18$), mental model strategies ($M = 2.55, SE = .16$), or fit appraisal strategies ($M = 2.54, SE = .16$). Thus training could, apparently, contribute to the production of more elegant solutions although it did not necessarily result in solutions of comparable elegance to those obtained through the induction of positive affect.

Discussion

Before turning to the broader conclusions flowing from the present study, certain limitations should be noted. To begin, the present study was based on a “classic” experimental paradigm where intuition was studied in a cognitive framework. As a result, the findings obtained in this effort do not speak to personality, or dispositionally, based views of intuition (Langan-Fox & Shirley, 2003). Although this cognitive paradigm has certain advantages, particularly with regard to demonstrating the impact of intuitive ability on creative problem-solving, caution is nonetheless called for in generalizing our findings to creative thought in “real-world” settings. Indeed, differences in expertise (Weisberg, 1999) and peoples’ involvement in the creative effort (Collins & Amabile, 1999) may lead to some shifts in observed relationships. Along related lines, it should also be recognized that the findings obtained in this study emerged as a function of a certain pattern of manipulations. Thus, it is possible that somewhat different effects might have been obtained if music was played throughout the study rather than just at the outset of the study. Moreover, while assessment of intuition just prior to starting work on the creative problem-solving task was consistent with the design of the present study, it is also true that the effects obtained might to some extent be contingent on prior exposure to training.

Finally, it should be recognized that we have in the present study examined only one form of creative problem-solving – although multiple attributes of the creative problem solutions were assessed. This observation, of course, implies that some caution is called for in generalizing our findings to other forms of creative problems. This limitation on generality, of course, applies to any study using a domain specific approach

such the present studies' assessment of intuition and creative problem-solving with the domain of school clubs. Nonetheless, the question remains as to whether our findings can be extended to other domains.

Even bearing these caveats in mind, we believe that the results obtained in the present study have some noteworthy implications. To begin, empirical studies directly demonstrating the impact of intuition on creative problem-solving have not been available (Shirley & Langan-Fox, 1996). The results obtained in the present study indicate that a measure of intuition examining the rapid production of correct solutions to club organizational problems was positively related to creativity when people were asked to create new ideas for clubs. These effects, moreover, could not be attributed solely to expertise however, important expertise may be in shaping the capacity for intuition (Simon, 1984). Instead, intuitive ability appears to arise from the capacity to recognize and exploit emergent patterns or themes – patterns that may not be subject to conscious awareness (Gardner & Nemirovsky, 1991; Policastro, 1995).

The basis of cognitive intuition in the recognition and exploitation of emergent patterns, however, has an important albeit often overlooked implication in studies of creative problem-solving. More specifically, the recognition and exploitation of patterns may have a rather complex set of effects on peoples' creative problem-solving efforts. The emergence and exploitation of patterns may, at least to some extent, contribute to solution originality. However, inarticulate patterns based on past experience may not necessarily give rise to the production of highly original solutions due to the demands for active, elaborative, processing required when people generate original solutions to creative problems (Baughman & Mumford, 1995; Finke, Ward, & Smith, 1992). Instead,

the emergence of these patterns may give rise to higher quality, and more elegant, solutions to creative problems when these emergent patterns provide a framework for organizing solution generation.

The results obtained in the present study, of course, provide some support for this argument. More specifically, individual differences in intuitive ability were found to exert stronger effects on solution elegance and solution quality than solution originality. By the same token, however, this pattern of findings suggests why the intense involvement of creative intuitives, such as Freud (Gardner & Nemirovsky, 1991) may be required. This intense engagement may serve as a compensatory mechanism contributing to the production of more original solutions.

The generation of creative problem solutions as a result of intuition, however, may not be solely a matter of the intuitive ability of individuals. Earlier, we argued that due to its effects on pattern formation and pattern recognition (Estrada, Isen, & Young, 1994; Kahn & Isen, 1994) positive affect might compensate for a lack of individual intuitive ability. In fact, the interactions obtained between intuition and affect tend to support this proposition. Individual intuitive ability was found to be strongly related to creative problem-solving only when people were working under affectively neutral conditions. Induction of positive affect appeared to remove this advantage with both intuitive and non-intuitive people performing well. Thus it appears that positive affect may substitute for intuitive ability in guiding creative problem-solving at least on the kind of creative problem-solving task under consideration in the present study.

These observations are noteworthy for two reasons. First, they bring to the fore the issue as to what other variables, aside from positive affect, might exist that would

compensate for a lack of intuitive ability. For example, it is possible that forecasting and planning might operate in a similar fashion (Mumford, Schultz, & Van Dorn, 2001).

Second, these findings suggest a need for research examining the role of positive affect in shaping the emergence of patterns – both the emergence of, and people’s willingness to work with, patterns on complex, creative, problem-solving tasks.

These observations about the mechanisms by which positive affect compensates for individual intuitive ability bring us to the effectiveness of the training interventions. The findings obtained in the present study indicate that training, regardless of affective state, led to improved creative problem-solving performance. However, training did not result in a better performance than inducing positive affect without training. This pattern of findings is consistent with the notion that training, at least initial training, may disrupt the application of well practiced problem-solving strategies. It suggests, moreover, that positive affect may also trigger more effective strategy application as well as pattern recognition.

More centrally, however, the strategy training provided examined three key explanatory systems that have been used to explain the emergence of intuition. More specifically, training was based on strategies derived from associational models, mental models, and fit appraisal theory. The finding that all three types of training appeared to work in a comparable fashion, with the exception of mental models in the generation of original solutions, suggests that all three of these systems represent plausible explanations for intuition.

Of course, it is possible that all three forms of training improved creative problem-solving rather than intuition per se. Although this alternative explanation can not

be completely ruled out by the results obtained in the present study, two considerations argue against this interpretation. First, the training provided did not give people experience in applying in creative problem-solving strategies as is the case in most creativity training interventions (Scott, Leritz, & Mumford, 2004). Second, the nature of the training provided was strategy application in the articulation of emergent patterns.

As a result, it seems plausible to assume that these three training interventions all may have contributed to the acquisition of intuition. If this is in fact the case, and this argument is confirmed by future research, it suggests that intuition may be a highly complex cognitive phenomenon with intuitions potentially arising from multiple underlying systems. Hopefully future research will demonstrate not only the potential operation of these multiple systems but will examine interactions among these systems as they give rise to emergent patterns and the intuitions held to be critical to creative thought.

Nonetheless, the findings obtained in the present study point to a stronger, less ambiguous, conclusion. More specifically, intuition clearly contributes to creative problem-solving. The nature of those contributions, however, suggests that intuition vis-à-vis pattern emergence may contribute more to the production of high quality and elegant solutions than original solutions. Given the role of emergent patterns in intuition, this pattern of findings is not surprising. However, it opens up questions about when and how intuition contributes to creative work, questions that should be investigated, along with underlying mechanisms, in future research.

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Table 1: Results of Analysis of Covariance for Solution Quality

	<i>F</i>	<i>df</i>	<i>p</i>	η^2
<i>Covariates</i>				
Intelligence	5.82	1, 301	.02	.02
Openness	6.86	1, 301	.01	.02
Class	4.76	1, 301	.03	.02
<i>Main Effects</i>				
Intuition	4.01	1, 301	.05	.01
Affect	.01	1, 301	.91	.00
Training	.23	3, 301	.87	.00
<i>Interactions</i>				
Intuition by affect	5.31	1, 301	.02	.02
Intuition by training	.28	3, 301	.84	.00
Affect by training	2.31	3,301	.08	.02
Affect by training by intuition	.76	3, 301	.51	.01

Note: *F* = F ratio; *df* = degrees of freedom; *p* = significance level; η^2 = effect size estimate

Table 2: Results of Analysis of Covariance for Solution Originality

	<i>F</i>	<i>df</i>	<i>p</i>	η^2
<i>Covariates</i>				
Intelligence	6.03	1, 304	.02	.02
<i>Main Effects</i>				
Intuition	2.46	1, 304	.12	.01
Affect	.36	1, 304	.54	.00
Training	.41	3, 304	.74	.00
<i>Interactions</i>				
Intuition by affect	3.08	1, 304	.08	.01
Intuition by training	.71	3, 304	.54	.01
Affect by training	2.42	3, 304	.07	.02
Affect by training by intuition	1.50	3, 304	.21	.02

Note: *F* = F ratio; *df* = degrees of freedom; *p* = significance level; η^2 = effect size estimate

Table 3: Results of Analysis of Covariance for Solution Elegance

	<i>F</i>	<i>df</i>	<i>p</i>	η^2
<i>Covariates</i>				
Intelligence	6.53	1, 303	.01	.02
<i>Main Effects</i>				
Intuition	7.60	1, 303	.01	.02
Affect	.55	1, 303	.46	.00
Training	.08	3, 303	.97	.00
<i>Interactions</i>				
Intuition by affect	2.53	1, 303	.11	.01
Intuition by training	.10	3, 303	.96	.00
Affect by training	2.54	3, 303	.06	.03
Affect by training by intuition	1.46	3, 303	.23	.01

Note: *F* = F ratio; *df* = degrees of freedom; *p* = significance level; η^2 = effect size estimate

Figure 1: Strategies Being Trained

Associational Models		Mental Models		Fit Appraisals	
Strategies	Examples	Strategies	Examples	Strategies	Examples
<p>1. Past Experiences: Think about past experiences with similar situations or people.</p>	<p>“Last week my friend was in a car accident while talking on his cell phone. Therefore, I associate talking on the cell phone with accidents. I won’t talk on my cell phone while driving.”</p>	<p>1. Past Causes: What has led to the desired outcome in the past?</p>	<p>“Previously, when I studied, I learned the course material. Because I learned the course material, I received a good grade.”</p>	<p>1. Strengths/weaknesses of Organization: What does the organization do well? What does the organization struggle with?</p>	<p>“My small liberal arts college does a great job teaching students. The University’s strength is in the quality of the faculty. The weakness is in their inefficiency due to an excess of administrative paperwork.”</p>
<p>2. Strong Reactions: Recall situations where you had a strong emotional reaction</p>	<p>“I was very upset when I heard about my friend getting in a car accident last week while talking on his cell phone. I won’t talk on the cell phone while driving.”</p>	<p>2. Key Causes: What are the events that have a big impact on big outcomes?</p>	<p>“Studying has a big impact on the success in school. Similarly, studying could have a big outcome such as becoming valedictorian.”</p>	<p>2. Culture of Organization: What has been happening at the organization? What kind of people work at the organization? What hours do people work?</p>	<p>“My University’s faculty collaborate on many projects together and gain recognition for the University by presenting at many conferences. Even with their busy schedules, faculty keep their office hours to meet with students. This is a reflection of the importance that faculty place on their students.”</p>
<p>3. Connections of ideas: Think about the connections between ideas. When I see x, I think of y.</p>	<p>“When I think of distractions and driving, I think of accidents.”</p>	<p>3. Causal Connections: What are the causal connections between ideas? How do they interact?</p>	<p>“Studying leads to learning, and learning leads to good grades.”</p>	<p>3. Infrastructure of Organization: What processes are in place to get work done? What systems are available to support these processes (computers, telephones)?</p>	<p>“Faculty have an open door policy and are easy to reach by e-mail or phone. Their administrative assistants do a great job of managing faculty members’ calendars and scheduling appointments for them.”</p>
<p>4. Differences in situations: How does the present problem differ from past problems?</p>	<p>“My friend was in a car accident while talking on his cell phone during rush hour in downtown Chicago. I am driving in rural Nebraska at 2am on a stretch of road with very little traffic.”</p>	<p>4. Major Contingencies: What are the major things that must be present for the desired result to occur?</p>	<p>“For good grades to occur, studying must be present.”</p>	<p>4. Impact of Decision: How will the decision disrupt or fit the normal pattern of interactions? Is the decision too disturbing?</p>	<p>“The decision to employ well-respected, approachable faculty allows students to form a relationship with a respectable member of their future field.”</p>
<p>5. Identify alternative paths: Make adjustments based on the unique aspects of the situation.</p>	<p>“When there is less traffic, driving while talking on a cell phone may not be as dangerous.”</p>	<p>5. Tradeoffs Between Outcomes: How will the action taken, impact the outcome? What is the desired outcome?</p>	<p>“When I have studied in the past, I learned the material, which has made my goal of earning a good grade easier to reach. If I don’t study as much, earning good grades will be more difficult. The desired outcome is to earn good grades.”</p>	<p>5. Expectations of People: Is the solution consistent with people’s needs and expectations?</p>	<p>“When students attend college, they expect to form relationships with the faculty and learn more about their future field from a respected expert.”</p>

Figure 2: Example of Strategy Training Exercise

You are on the fundraising committee of the International Student Club. You have a great group this year. Everyone is enthusiastic and willing to help. This is great, because in previous years, getting people involved was like pulling teeth. Your club typically has one big fundraising event each semester. This year, you plan on selling t-shirts with the logo of your university on the front. You were able to get the t-shirts at a great price, only \$1.00 per shirt. You are planning to sell them for \$5 and you are excited about the profit you will be making. Another good point about selling t-shirts is that the person that you purchased them from will buy back every t-shirt not sold. Two days ago you set up a booth in a high traffic area on campus. You are very disappointed that in two days you have only sold 10 t-shirts. You know that college students wear a lot of t-shirts so you aren't sure why they aren't selling. You are seriously considering returning the t-shirts and trying something else. This fundraising idea doesn't seem to be working. Previous fundraising activities have brought in \$500. Your group is used to earning this kind of money to be able to purchase the films to show at the International Film Night. If you don't raise the money, you will have to cancel the International Film Night. You have to decide what to do soon. The money for the down payment of films needs to be turned in next week. Keeping associational models in mind, what can you do?

Solution:

Associational Models
Think about the characteristics of past successful fundraising events.

Think about past experiences to make a decision. Think about previous successful fundraising events. Last year, each student made food from his/her home country. It was a huge success. Since the t-shirts are not selling and this is not a successful fundraising idea, return the shirts and organize the new fundraising event as soon as possible.

Figure 2: Continued

You have been a member of the debate team for three years. Although you don't hold a leadership position this year, because of past experience, people look to you for guidance. Homecoming is next week and the club has been deciding on the theme for their parade float. The debate team float is always one of the best floats in the parade. Last year, the team received first prize for creativity. The budget was a little tight this year because of a big debate trip a couple of months ago. Because of that, the team had to be thrifty when purchasing the float materials this year. No one really expects the club to pay for these debate trips since all of the debate team members come from fairly affluent families, but it's nice that the club can be a sponsor. For the past three years, the floats have been built at your house and you have volunteered to host the float-building event again this year. Because the debate team is a fairly small club (about 15 people) the debate team members are tight knit. Last night everyone from the team came over and you worked on the float for five hours. It looked great when everyone left. When you woke up this morning, you were disturbed to find that someone had destroyed the float. It was smashed and broken in pieces beyond repair. You have to break the news to the club and then decide what to do. You know that everyone will be very disappointed. Keeping mental models in mind, what can you do?

Solution:

Mental Models
Having no float in the parade would lead to disappointment. Float materials are not that expensive and you know that team members come from affluent families.

Think about the causal connections between ideas when making a decision. We know that if there is no float people will be disappointed. We also know that float materials are not that expensive. Given that the members of the debate team come from affluent families, perhaps an option would be for everyone to chip in some money for the float supplies. A good solution would be to explain the situation to the group and ask everyone to take a vote.

Figure 2: Continued

You are the Treasurer of the running club and borrowed some money from the club account to purchase some new running shoes yesterday. This is something that is accepted in the club since everyone is tight on funds. There is an understanding that members can borrow from the club account as long as they pay it back within the next month. It makes keeping track of the accounting information a little tricky, but everyone agrees that it is worth it. Running shoes are very expensive for college students and your club wants to make sure that you eliminate obstacles that someone may have to achieving their top running performance. Unfortunately, you just received notice that the check you wrote for the shoes has bounced. You thought that there was enough money in the account since you deposited the money this morning from your fundraising event. Generally it takes a couple of days after writing a check for the funds to be withdrawn from the account. Apparently there is a new banking system in place that automatically deducts funds from your account rather than taking a couple of days while the store contacts the bank for the money. You have been a reliable treasurer in the past, but the other officers are really mad about this happening. Keeping fit appraisals in mind, what can you do to earn back the trust of your fellow officers?

Solution:

Fit Appraisal
Find a solution that fits but doesn't threaten the potential of still purchasing shoes for club members - pay fees for check bouncing and implement a new internal accounting system

Think about expectations of people when making a decision. You want to keep the perk of having the club pay for the running shoes of members since this is part of the culture of the group. In order keep this perk you need to rebuild the trust that you have temporarily lost. You decide to do this by paying the fees for the check bouncing out of your personal account. You also decide to implement a new internal accounting system. You are already familiar with the software so you don't have to learn anything new. This solution is consistent with the expectations of group members.

Figure 3: Example of Problem Used to Measure Intuition

Start Time: _____

You need to choose a faculty advisor. Dr. Andrews is your personal first choice, but you are uncertain about him. He makes the students work really hard and many students dislike him. Dr. Andrews has worked in this city for 15 years in executive level positions at Harrisons (a local organization employing thousands of people in your city). He has now been with Higher Education University for 10 years and is a full professor. His contacts in the area could potentially provide some interesting presenters for the group. An alternative choice is Dr. Thompson. Everyone likes Dr. Thompson, but he is somewhat unreliable. He is rarely in his office and at times seems distracted. Dr. Thompson has been at Higher Education University for ten years and is a full professor. He is familiar with the culture and history of the University. Students like Dr. Thompson because he is friendly and approachable. Who will you choose as your faculty advisor?

Please write your decision below.

Finish Time: _____

Figure 4: Example of Additional Materials Provided

Start Time: ____

Additional Materials

These additional resources can be used as you proceed through this decision.

The day-to-day leadership and vitality of each chapter depends largely on chapter officers who can encourage, inspire, and motivate their fellow members.

In other clubs that you have been involved in the leaders had the following characteristics:

- Highly motivated
- Intelligent
- Responsible
- High level of integrity
- Organized
- Past experience in clubs

The role of Vice President is as follows:

- Support the President with all administrative duties
- Manage activities of the organization
- Monitor task force activities
- Fill in when the President is unavailable
- Schedule meeting rooms
- Act as the liaison with faculty
- Work with the President to coordinate with area businesses and schedule presenters

The 50 people that voted seem have shown a strong interest in the success of the club. They have provided great ideas to you via e-mail and telephone. It seems like it is going to be a great club with strong involvement. Of the 50 people that voted, 30 are commuter students that work full time. The other 20 live within walking distance of campus and are full-time students.

Finish Time: ____

In the space below, please write what information you used out of the additional resources and describe how this was helpful in making your decision.

Figure 5: Rating Scales and Benchmark Examples

Quality	Originality	Elegance
<p>5) Excellent rating: <i>First, I will consider the need or demand for the type of club that I would like to start. I would like to start a bowling club. The mission of the group will be to promote interest in bowling and improve bowling skills. I will assess the interest by sending out a mass e-mail and inviting students to an informal informational meeting. Based on this interest, I will work on recruitment. I will recruit members for the bowling club by posting flyers around school and in our student bowling alley. Weekly meetings will be held where we will be able to hold bowling competitions. Fundraising events will be held two times a year where we will sell candy bars. The money earned from the fundraising activities will be used to hold a party at the end of the year and provide snacks at the weekly bowling meetings. Members will need to pay to bowl at the meetings each week, but the cost will be reduced based on the success of the fundraising activities.</i></p> <p>4) Average to excellent rating: 3) Average rating: <i>I will be starting an animal rights club. I will be recruiting by using mass e-mailings, posters, etc. Fundraising will be completed by selling candy bars. Meetings will take place once a week. The mission of the club would bring together people that had a passion for the same thing and that were willing and wanting to go out and do something about it.</i></p> <p>2) Poor to average rating: 1) Poor rating: <i>I would like to start a fly fishing club. This club will have educational meetings every 2 months and take trips to different rivers on weekends as the main activity. This will be a social group to unite fishermen.</i></p>	<p>5) Excellent rating: <i>I would like to start a photography club. The mission of the club will be to document the University of Oklahoma campus. We will partner with the history club to create a historical pictorial of the University. This will take place over several seasons so as to capture the beauty of the campus at various times of year. I will recruit members by posting flyers in the art school. I will also collaborate with University photography instructors to promote the idea. We will need to do lots of fundraising to pay for the film and photo paper used for this project. We will accomplish this by having photo shoots for students around campus and sell them pictures. I will work with the photography faculty to let us use the University processing labs. The mission of this group will be to capture the beauty of our campus on film.</i></p> <p>4) Average to excellent rating: 3) Average rating: <i>I would like to start a volleyball club. I know several people who love to play volleyball and would like to join a club like this. In the winter months we will play indoors at the gym and in the summer we will play sand volleyball by the dorms. I will recruit members by posting flyers at the gym and campus restaurants. We will raise funds by coaching junior high school volleyball players on the weekends. We will use these funds for an end of year party and for Gatorade during practices and games.</i></p> <p>2) Poor to average rating: 1) Poor rating: <i>I would like to start a film club. In this club, we will watch movies and eat popcorn. We might also talk about the movies sometimes.</i></p>	<p>5) Excellent rating: <i>I will start a summer book club. I know that a lot of students stay around in the summer and may be interested in participating in a book club before or after their summer course has finished. We will hold meetings at Barnes and Noble on Tuesday evenings from 7-8pm. I will advertise at Barnes and Noble with flyers and around campus with sidewalk chalk. We will raise funds by holding weekend reading seminars for groups of children. We will charge a small admission to read books to children of various ages and having age appropriate discussions. Funds will be used to purchase coffee at meetings. The mission of the club will be to promote the love of books.</i></p> <p>4) Average to excellent rating: 3) Average rating: <i>I would like to start a support club for people who have a family member at war. In this club we will share stories, and talk about issues we face due to the negative perception of the war around the world. I will recruit by mass e-mailings and sidewalk chalk. I will also hang flyers outside the Veteran's Affairs Office on campus. We will meet weekly.</i></p> <p>2) Poor to average rating: 1) Poor rating: <i>I would like to start a club for new students at the University. This club will help new students become adjusted to life in college. We will hang out and keep each other company.</i></p>

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