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Interrelationships between Creative Thinking, Academic Achievement, Anxiety and Peer Relations among Lebanese Armenian Secondary School Students

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DEDICATION

I gratefully dedicate my thesis to my husband, Nercess Baghdoyan, and daughters, Arine and Meghri.

Dearest Nercess, thank you for being the best partner in life any person would wish to have. Since the day we met, you've always been my happiness, my rock of support and encouragement, and the one ,who makes me want to be a better person every day.

Dearest Arine and Meghri, thank you for being "the moms" instead of the kids many times during the years of my study. Thank you for your messages wishing me good luck on my exams, and for your help in daily house chores. I thank you most of all for the proud smiles you had on your faces each time I achieved and succeeded. I am so proud of who you are.

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Abstract

Creative thinking is a form of problem solving involving the production of multiple novel solutions to a given problem. The aim of this study was to investigate the relationships between the independent variables (facilitating anxiety, debilitating anxiety, and peer relations) and the dependent variable (creativity) in a convenient sample of 141 students in grades 10, 11, and 12 drawn from four Lebanese Armenian Secondary schools. Participants filled a battery of questionnaires which included demographics questionnaire (gender, age, grade level, nationality, academic achievement); Wallach and Kogan Creativity Test, the Alpert Haber Achievement Anxiety Test and the Index of Peers Relations. The main findings of this study were that academic achievement was found to be a significant positive correlate and predictor of the three measures of creative thinking (fluency, flexibility and originality). Moreover, facilitating anxiety was found to be a significant positive correlate with the three measures of creative thinking (fluency, flexibility and originality). In addition, peer relations was found to be a significant positive correlate and predictor of the two measures of creativity thinking (fluency and flexibility), and a significant positive predictor of the third measure of creativity (originality). Finally, female participants tended to have higher levels of creativity compared to males as measured by the flexibility scale only.

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CHAPTER I

INTRODUCTION

The literature on creativity is vast and rich; it dates back to Plato's era, and references to creativity have been found in Greek, Judaic, Christian and Muslim traditions (Craft, 2001; Cropley, 2004; Shaheen, 2010). Galton (1869) was the first to systematically study creativity. In his work, he focused mostly on the concept of 'genius', and his research sprung a considerable amount of debate and research on creativity and creative 'genius' (as cited in Craft, 2001, p. 5). The study of creativity became more systematic at the turn of the 20th century (Craft, 2001). It has been studied in many forms, including creativity in specific domains versus creativity as a general process, high creativity versus ordinary creativity (Craft, 2001), across several disciplines including, sociology, education, and psychology, and from several different perspectives within psychology, such as the cognitive, behavioral, humanistic, and psychoanalytic (Craft, 2001; Roue, 2011).

Due to the multiplicity of the disciplines and perspectives that have examined the construct of creativity, there are several different conceptualizations of creativity; for example, some conceptualize creativity as discovering new things and creating novel products (Martin, 2006) while others conceptualize it as problem solving that involves assembling new meaning (Runco, 2003) and applying knowledge and skills in novel ways (Seltzer & Bentley, 1999). Furthermore, creativity has been studied in relation to an array of constructs and factors including personality traits such as agreeableness and openness to experiences and extraversion

(Batey, Chamorro-Premuzic, & Furnham, 2010; Sung & Choi, 2010), as well as cultural factors such as collectivism and individualism (Bechtoldt, Choi, & Nijstad, 2012).

Much of the research on creativity has also focused on the development, influence or stimulation of creativity, especially in the educational setting (Craft, 2001). Interest in creativity in education and education policy came about with the Soviet Union's successful launch of the satellite "Sputnik 1" in 1957, whereby the failure of engineers of the Western world was attributed to the lack of creativity (Shaheen, 2010). This sprung debate and research in the United States, the United Kingdom and other countries, on the role formal education was playing in fostering creativity. Formal education was criticized for "killing creativity" and fostering conformists rather than free and original thinkers (Shaheen, 2010, Kalia, 2005). Research on the stimulation of creativity showed that creativity could indeed be taught and developed in students through learning (Karkockiene, 2005). Thus research focused on curricula that would emphasize creativity and found that such educational and curricular reforms could enhance growth of creativity in a society or culture (Chung Cheung & Lau, 2013). Research also focused on the characteristics and role of the teacher, with elements such as teacher education level, teachers' attitudes towards creativity, and student teacher relationships as influential factors (Craft, 2001; Tornkvist, 1998).

Research has highlighted the importance of fostering creativity in schools and has shown that creativity has benefits at the personal level, in terms of fostering motivation and helping students to find structure and meaning in their lives (Annarella, 1999, as cited in Craft, 2001, p. 11), social level, in terms of fostering cooperation and team work (Craft, 2001), cultural level, in terms of instilling ideas of cultural change and shift (Craft, 2001), and economical level, in terms of developing an 'entrepreneurial culture' that adapts to change and attaining higher

economic achievements (Weaver, 1999). As such, education policy has been highlighting the importance of creativity in formal education and thus making it a core component of formal education. This has been more prominent in developed countries, compared to developing countries such as Lebanon where creativity remains relatively neglected (Shaheen, 2010).

Given that research has highlighted the importance of fostering creativity in schools and has shown that creativity has benefits at the personal level, social level, cultural level, and economical level, it is important to assess creativity in school settings and take first steps towards understating creativity to pave the way for future research. Thus, the current paper examined creativity and its correlates in Lebanon, focusing on high school students in Lebanese Armenian schools. Specifically, the author studied three correlates of creativity namely academic achievement, anxiety, and peer relations among Armenian high school students. Given the scant literature on creativity among school students in the Arab world generally and in Lebanon specifically (Alawad, 2012; Aljughaiman & Ayoub, 2012; Alothman, 2012; Dababneh, Ihmeideh, & Al-Omari, 2010; Khaleefa, Erdos, &Ashria, 1997), the author hoped to contribute to thisliterature by examining this relationship and using a sample of Lebanese Armenian school students, who receive little attention in the published literature as a starting point.

In the coming sections, the author gave the definition of creativity adopted for the current study and then briefly examined the literature on creativity and its correlates.

Background of the Study

Given that there are many definitions and conceptualizations of creativity in the literature, the author adopted the conceptualization put forth by Guilford (1950;Guilford, 1959, 1967, as cited in Lemons, 2011, p. 744). In his definition of creative abilities, Guilford focused on divergent thinking, which he defined as a form of problem solving involving the production

of multiple novel solutions to a given problem. He identified five factors involved in creative problem solving: *fluency* referring to the ability to generate many responses, *flexibility* referring to the ability to switch ones approach to generate many ideas, *sensitivity to the problem* which is the ability to recognize the different features of the problem, *originality* referring to the ability to generate unique ideas and *elaboration* referring to the ability to adorn and flourish ideas (Lemons, 2011). Guildford's theory of creativity was so popular that it became the basis of many creativity tests such as the Torrance Tests of Creative Thinking (TTCT) and the Wallach–Kogan Creativity Test (WKCT) (Lemons, 2011).

Creativity and Academic Achievement

While creativity has received considerable research attention in contemporary psychology, the systematic study of creativity began around the 1950s (Runco, 2006), with most of the early studies focusing on the relationship between creativity and intelligence. One of the first studies to systematically examine this relationship(Getzels & Jackson, 1962, Roke & Kalis, 2015, p. 8) is also the first study that found a positive relationship between creativity and academic achievement, influencing education psychologists and leading to a plethora of research on the relationship of creativity and academic achievement and making academic achievement one of the major correlates of creativity studied (Ai, 1999).Yet the results of these many studies have not always converged (Ai, 1999). On the one hand, many researchers such as Torrance (1962, Roke & Kalis, 2015), Yamamoto (1964), and Asha (1980, as cited in Roke & Kalis, 2015, p. 8) have replicated Getzels and Jackson's (1962, as cited in Roke & Kalis, 2015, p. 8)report of a positive relationship between these two constructs. On the other hand, some research, found that academic achievement and creativity were not related (Edward & Tyler, 1966, as cited in Roke & Kalis, 2015, p. 8; Kim & Michael, 1995). One potential explanation of

these mixed results was attributed to methodological factors whereby different studies have used a variety of different methods to measure and operationalize creativity; furthermore, in their measure of academic achievement they have used different measurements and focused on different subject areas (Ai, 1999). Another possible explanation is that this relationship is mediated by other factors (Ai, 1999).

More recently, however, research seems to be supporting the potential positive relationship between the two constructs. Ai (1999), examined the relation between creativity and academic achievement in 2,264 secondary students from 68 schools in Spain. Students were asked to report their grades on subjects of Spanish, Basque, English, social sciences, natural sciences, math as a measurement of academic achievement. Moreover, the creativity level of each student was rated by his/her teachers. Ai (1999) found a positive relationship between creativity and academic achievement; indicating that students who had higher levels of creativity tended to have higher levels of academic achievement. In congruence with Ai's (1999) study, Ridermann and Neubauer (2004) found a moderate positive relationship between creativity and academic achievement among students in 9^{th} and 11^{th} grades in German schools. Furthermore, Roke and Kalis (2015) examined the relationship between creativity and school grades in9th grade students (N=180). They measured creativity using the Test for Creative Thinking – Drawing Production which asks subjects to finish uncompleted drawings. For the academic achievement measure, they relied on average school grades. Roke and Kalis (2015) found a positive relationship between average school grades and the measure of creativity used; indicating that students who had higher levels of academic achievement tended to have higher levels of creativity.

While these studies were conducted with secondary school students and were cross-sectional in nature Wallace and Russ (2015) looked at younger children and adopted a mixed cross sectional and longitudinal methodology. Wallace and Russ (2015) examined the relationship between divergent thinking, its components of originality and fluency, and math achievement. They used the Wallach and Kogan (1965) adaptation of Guilford's Alternate Uses Task to measure creativity. First they examined these abilities in 61 female students in kindergarten till grade 4, four years later they examined these abilities in 31 of the female students when they had reached grades 4 till 8. In their concurrent examination, they found that divergent thinking was related to current mathematical abilities, with fluency being related to mathematical comprehension. In their longitudinal examination Wallace and Russ (2015) found that baseline divergent thinking predicted mathematical abilities four years later. Furthermore, looking at the divergent thinking components, they found fluency and originality predicted mathematical comprehension. Wallace and Russ (2015)'s findings lend support to the literature on the positive relationship between creativity and academic achievement across school children of different ages.

Academic achievement has been studied in relation to creativity since the beginning of the systematic study of creativity in psychology, highlighting its relevance and importance as a correlate of creativity. The literature examining its relationship to creativity, especially the more recent examinations indicate the presence of a positive association between the two constructs. This positive relationship seems to hold across concurrent and longitudinal designs and despite the variety in the measurement of the two constructs and the differential age focus. As such, it is also possible that such positive relationships are found in this study. Looking at the components of creativity (fluency, flexibility and originality), research seems to be more limited and does not

seem to indicate the presence of consistent and systematic relationships with academic achievement. As such, in this study, the relationship between the components of creativity and academic achievement was explored.

Creativity and Anxiety

While creative and thus novel ventures are usually associated with excitement as well as anxiety (Carlsson, 2002), it has been proposed that anxiety is not only associated with creative ventures but also creative people (Martindale & Armstrong, 1974; Martindale, Anderson, Moore, & West, 1996). As such, anxiety as a correlate of creativity has received considerable research attention (Byron &Khazanchi, 2011). Most studies examining the relationship between creativity and anxiety found mixed results concerning the nature of the relationship (Byron &Khazanchi, 2011). Some studies have found that there is a very weak relationship between creativity and anxiety (Silvia & Kimbrel, 2010). Other studies, have found that anxiety is higher in people who have higher levels of creative ability (Carlsson, 2002; Carlsson, Wendt, &Risberg, 2000)**.** While still others studies, have found a negative relationship between the constructs indicating that anxiety is detrimental to creativity (de Acedo-Baquedano & de Acedo-Lizarraga, 2012; Byron & Khazanchi, 2011).

Given the mixed reports on the relationship between the two constructs, Byron & Khazanchi (2011) conducted a meta-analysis of the literature on the relationship between anxiety and performance on figural and verbal creativity tests. The researchers concluded that anxiety was significantly negatively related to creative performance. Byron & Khazanchi (2011) also noted that a variety of factors affect this relationship such as the type of the creativity task and anxiety type. For instance, when a greater portion of the creativity tests was verbal the

relationship was strongly negative, while concerning the type of anxiety measure, the relationship with trait anxiety was more negative as compared to state anxiety.

Further, Byron & Khazanchi (2011) recommended that future research examine creativity in relation to the two component model of anxiety. The two component model of anxiety, which has been suggested by many scholars (Byron &Khazanchi, 2011; Raffety, Smith, &Ptacek, 1997), conceptualizes anxiety to have a debilitating component which interferes with and disrupts performance and a facilitating component which increases stimulation and motivation to perform.

Based on these recommendations, Little &Wuensch (2015) examined the relationship between creativity and anxiety using this two component model. They studied this relationship in a sample of 102 undergraduate university students. To measure creativity, participants were given pictures and asked to provide creative captions and two judges rated the creativity captions. To measure the two component model of anxiety the researchers used a modified version of the Alpert and Haber (1960) debilitating and facilitating anxiety scale. Little &Wuensch (2015) found that facilitating anxiety was positively related to creative ability, while there was no relation between creative ability and debilitating anxiety (Little &Wuensch, 2015). They also found a negative relationship between the two types of anxiety, thus highlighting that they are distinct factors. The researcher suggested that more research is needed for further exploration of this relationship (Little &Wuensch, 2015). It is important to note that Little &Wuensch (2015) did not examine the components of creativity and their relation to the anxiety components.

The current study heeded Byron and Khazanchi's (2011) recommendation and considered the debilitating and facilitating component of anxiety. The author suspected to find a positive

relationship between facilitating anxiety and creativity as previously demonstrated in the literature. Since debilitating anxiety was found to be negatively related to facilitating anxiety, a negative relationship between debilitating anxiety and creativity was suspected. Further, since the relation of the components of creativity and the two anxiety components were not measured, this study explored this relationship.

Creativity and Peer Relations

In the examination of the literature on the correlates of creativity the author has focused on anxiety, which examines students' internal state, as well as academic achievement, which examines students' performance. She was also interested in examining creativity in relation to the students' social life and social experience. Searching the literature through different reliable databases, few articles have examined the relation between creativity and students' social life (such as: Kurtzman, 1967; Lau & Li, 1996; Pachucki, Lena, & Tepper, 2010).Some of these studies have focused on the relationship between creativity and popularity and acceptance by peers. For example, Lau and Li (1996) examined the relationship between popularity and peer-perceived creativity in a sample of 633 Grade 5 Chinese students. Based on peer nominations, students were divided into 5 status groups: average, popular, neglected, rejected, and controversial. In a more recent example, Lau and Li (1996) found that popular children were judged as the most creative, followed be the children in the controversial group, referring to children accepted by some peers and rejected by others. There groups were judged to be significantly higher in creativity than the average group who were judged to be significantly higher in creativity than the unpopular children (neglected and rejected groups). These findings suggest that creativity is potentially related to peer acceptance and popularity (peer status). Moreover, specifically, the findings concerning the controversial group suggest that creativity is

not always perceived positively. In a more recent study, Lau, Li, and Chu, (2004) examined the relationship between creativity and peer acceptance in a sample of 31 Chinese students in grades 4 through 7 who were part of a gifted education program. Lau et al. (2004) found that creativity was associated positively with being disliked and not related to being liked, and it was positively related to peer-evaluated characteristics of aggressiveness and disruptiveness, sensitivity and isolation as well as sociability and leadership. Lau et al. (2004) concluded that creative children may generate mixed feelings among their peers. While a few of these studies have focused on the relationship between creativity and individual sociability. For example, Pachucki et al. (2010) investigated college students' perceptions of their creative contributions to campus life in a qualitative study. The authors asked a sample of 128 university students to keep descriptions of where and how they felt most creative during their college life and upon analyzed these descriptions found that students felt most creative when interacting with others indicating that creativity was associated with social interactions. More recently, Ghayas and Malik (2013) examined the relation of sociability to creativity in the sample of 300 undergraduate students. They found a significant positive and moderate correlation between sociability and creativity and found that sociability was a significant predictor of creativity.

While these studies do not tap into students' self-reported peer relations, and do not target the same population as the author of the current study, they provide an idea about the relationship between students' level of creativity and their social life by showing their self-reported sociability and how they are perceived by their peers. The scarcity of articles on this relationship highlights the potential importance of examining creativity in relation to peer relations. Based on the results of these studies, the author expected to find a positive relationship between creativity and problematic peer relations. Meaning the author expects to find that the

more creative students the more they will report problems in their peer relations. Further, since the relation of the components of creativity and peer relations have not measured, the study explored this relationship.

Statement of the Problem

The aim of the current study was to explore creativity and its correlates, in a sample of students in secondary grade levels in Armenian schools in Lebanon. Based on the literature and in an attempt to examine the creativity in high school students from a more holistic perspective, the correlates to be explored were academic achievement, anxiety and peer relations.

Concerning the relationship of creativity and academic achievement, in recent literature, there is a positive relationship between the two constructs; as such the author hypothesized that:

Hypothesis 1: There would be a positive association between creative thinking and academic achievement.

The literature, on the relation between the components of creativity and academic achievement, however, has been limited and has not indicated the presence of consistent and systematic relationships; as such this relationship was explored through the following research question:

Research Question 1: What is the relation between the components of creative thinking and academic achievement?

Concerning the relationship of creativity and anxiety, the recent research has recommended focusing on debilitating and facilitating components of anxiety and has found a positive relationship between facilitating anxiety and creativity, a negative relationship between facilitating and debilitating anxiety, but no relationship between debilitating anxiety and creativity. As such the author hypothesized that:

Hypothesis 2: There would be a positive association between creative thinking and facilitating anxiety.

Hypothesis 3: There would be a negative association between creative thinking and debilitating anxiety.

Further, given that the specific relationship between the two components of anxiety and the facets of creativity has not been studied, this was explored through the following research questions:

Research Question 2: What is the relation between the components of creative thinking (fluency, flexibility, and originality) and facilitating anxiety?

Research Question 3: What is the relation between the components of creative thinking (fluency, flexibility, and originality) and debilitating anxiety?

And finally, while the author of the current study was interested in the relationship between creativity and students' social life, the literature has focused mainly on the relationship between creativity and popularity and peer acceptance as reported by peers, and sociability and has found positive relationships. The studies in the literature give insight into the potential relationship between creativity and self-reported peer relations. As such the author hypothesized that:

Hypothesis 4: There would be a positive association between creative thinking and peer relations.

Further, the relationship between peer relations and the facets of creativity was explored through the following research question:

Research Question 4: What is the relation between the components of creative thinking and peer relations?

Implications/Significance of Research

The aim of this study was to examine creativity and its relationship to academic achievement, anxiety and peer relations in secondary grade levels in Armenian schools in Lebanon. This study contributes to the scant research on creativity in the Arab world generally and in Lebanon specifically (Alawad, 2012; Aljughaiman & Ayoub, 2012; Alothman, 2012; Dababneh, et al. 2010; Khaleefa et al., 1997). The current study also provides insight into creativity in current school curricula in Lebanon, specifically curricula in Lebanese Armenian schools which are more loaded than their Lebanese counterparts because of their inclusion of subjects related to Armenian culture.

Further, the current study's examination of the relationship between creativity and academic achievement provides insight into the importance of fostering creativity in schools, and hence the possibility of generating more research related to the improvement of students' academic achievement through creative thinking. The importance of this lies in the idea that during the late adolescent years, creativity becomes as valuable as intelligence (Ruiz, Bermejo, Ferrando, Prieto, & Sainz, 2014), which has traditionally been the major point of focus in relation to academic achievement schools.

Moreover, the study aimed also to contribute to the literature on creativity and anxiety through its specific focus on the two component model of anxiety which conceptualizes anxiety as having a debilitating and facilitating component and which has only been examined in one other study (Little &Wuensch, 2015).

Finally, the current study is novel in the attempt to study the relationship between creativity and self-reported peer relations, which has not been attempted in the literature before.

Overview of Methodology

The study used a quantitative correlation design to examine the aims and hypotheses. Participants were recruited from Lebanese Armenian Schools in different areas in Beirut and its suburbs. Data was to be collected from a convenient sample of Lebanese Armenian secondary students in grades 10, 11 and 12. Parental consent forms (Appendix A) and a student assent forms (Appendix B) were to be distributed to the students. Data was to be collected using a questionnaire booklet which included 1) a demographics questionnaire which asked about gender, age, nationality, and grade level (see Appendix C), 2) a question asking participants whether they agreed that the investigator use their final grades in the research and if yes to provide a self-report of their final year grades from the previous year (see Appendix C), 3) a version of the Wallach and Kogan Creativity Test (WKCT, Wallach & Kogan, 1965) modified by Roue (2011) to measure creative thinking and its three facets fluency, flexibility and originality (see Appendix D), 3) the Alpert Haber Achievement Anxiety Test (AAT; Alpert & Haber, 1960) to measure debilitating and facilitating anxiety (see Appendix D), 4) and finally, the Index of Peers Relations (IPR; Hudson, 1997) to measure peer relations.

Procedures

First, the school principals were contacted by the investigator and invited to allow their students to participate in this proposed study. A parental consent form was to be distributed to the students and they would be asked to return them signed by one of their parents (Appendix A). Students who have parental consent would be given an assent form, and only students who provided assent would participate in the study (Appendix B). Only participants who obtained their parental consent and who signed the assent form would be asked to fill out the questionnaire battery. The questionnaire battery included the demographics questionnaire

(Appendix C) and the 3 instruments to measure the variables under study; creative thinking, anxiety and peer relations (Appendix D).

Limitations

The study included a number of limitations. First, data were collected from a convenient sample of 150 students in grades 10 through 12 from three Armenian schools in Lebanon and therefore, the results the author obtained in the study could not be generalized..

Definitions

For the purpose of the current study, the main variables under study were defined as follows.

Creative thinking: It is a form of problem solving involving the production of multiple novel solutions to a given problem (Guilford, 1950; Guilford, 1959, 1967, as cited in Lemons, 2011, p. 744).

Debilitating anxiety: It is a component of anxiety which interferes with and disrupts performance (Raffety et al, 1997).

Facilitating anxiety: It is a component of anxiety which increases stimulation and motivation to perform (Raffety et al, 1997).

Peer relations: It is defined as both positive and negative interactions with mates of the same age (Naylro, 2011).

CHAPTER 2

Review of Literature

The purpose of the current study was to examine and explore creativity and its correlates in a sample of Armenian secondary school students in Lebanon. The relationship of creativity with the two correlates academic achievement and anxiety was examined, while the relationship between creativity and the correlate peer relations was explored. The current study aimed to contribute to the scant literature on creativity and its correlates in the Arab World in general, and Lebanon in specific, and to provide insight into creativity in current school curricula in Lebanon.

Theories of Creativity

Creativity is an extremely complex and multifaceted process (Runco, 2006). As such, there are many approaches to the study of creativity spanning across different disciplines, and consequently many different definitions of creativity (Kozbelt, Beghetto, &Runco, 2010; Runco, 2006). Creativity has been studied from biological, developmental, evolutionary, educational, clinical, behavioral, and cognitive perspectives, among others, and there have been variations not only between but also within the different perspectives (Kozbelt et al., 2010;Runco, 2006). Each perspective makes a different assertion concerning the nature and components of creativity (Kozbelt et al., 2010).Kozbelt et al. (2010) suggest that to understand creativity in its entirety and complexity, a mass of theoretical perspectives each with different assertions and methods must come together.

Looking at some of the theories of creativity, developmental theories of creativity focus on creative people, their creative potential, their environment and the products of their creativity. (Kozbelt et al., 2010). Developmental theories assert that creativity develops over time from

creative potential to creative achievement, and that this development is influenced by personal and environmental factors including engaging in play and types of play, parental style, family background and structure. These theories focus on the root of the creativity but also on designing environments to foster creative the potential of children (Kozbelt et al., 2010). Evolutionary or Darwinian theories in addition to focusing on the creative person and product of creativity also focus on the process of creativity. According to these theories creativity is a mental process involving 2 stages. A stage of blind generation where typically ideas are combined in some blind fashion, and a stage of selective retention whereby the most interest blind combination of ideas are developed and elaborated into a finished creative product (Kozbelt et al., 2010). Systems theories of creativity on the other hand take a very broad view and ascertain that creativity results from a complex system of interactions and interrelated factors (Kozbelt et al., 2010).

Theories of creativity under the cognitive perspective have been the most numerous either because of the intuitive appeal of the relation between cognition and creativity or the highly scientific nature of cognitive research (Runco, 2006). The primary assertion of cognitive theories is that the foundation and basis of creative achievements and creative people are the individual thought processes that lead to the formation of ideas (Kozbelt et al.,2010). The theory and definition of creativity proposed by Guilford (1950, 1959, 1967, as cited inLemons, 2011, p. 744) which was adopted in this study and which was referred to in the previous introduction section falls under the cognitive perspective. Guilford (1950) defined creativity as the ability to be creative and generate creative results. According to Guilford (1950) a key factor of creativity is divergent thinking, which he defined as a process of generating novel ideas and solutions in the face of problems or questions that do not have just one answer (Guilford, 1950; Lemons, 2011; Runco, Dow, & Smith, 2006). Divergent thinking occurs in response to problems when

ideas and associations move in diverse directions and as a result new ideas may be formed. It is contrasted with convergent thinking which occurs in response to problems or questions with just one correct answer and where ideas are eliminated to arrive at the correct answer such as in response to multiple choice questions (Kozbelt et al., 2010; Neck, Greene, & Brush, 2014; Roue, 2011).Guilford (as cited in Lemons, 2011, p. 744) identified a number of dimensions involved in this creative problem solving process including *fluency* (ability to generate many responses), *flexibility* (ability to switch ones approach to generate many ideas), *sensitivity to the problem* (ability to recognize the different features of the problem), *originality* (generate unique ideas), and *elaboration* (ability to adorn and flourish ideas). Divergent thinking is now a widely accepted factor of creativity that can signify one's potential for creative performance (Charles &Runco 2001).

Correlates of Creativity

Creativity has been studied in relation to many different factors (Roue, 2011). These factors have mainly been related to individual cognitive abilities, personality traits, and background characteristics such as family background (Ghayas & Malik, 2013). The study of creativity in psychological science began with Guilford's (1950) address to the American Psychological Association in which he called for systematic research of creativity within psychology. When researchers heeded Guilford's call and began systematic studies on creativity, the field of creativity needed to separate itself from other scientific topics of interest (Runco, 2006).

Creativity and Academic Achievement

Specifically, the field of creativity needed to show that creativity was independent of intelligence. As such, the key debate at the time concerned the relationship between creativity and intelligence(Runco, 2006).

Getzel and Jackson's (1962) influential study. Among the first researchers to study this relationship were Getzel and Jackson (1962; as cited in Palaniappan, 2007, p. 146) who compared the academic achievement of a group of students who has scored in the top 20% on intelligence (IQ) tests in the school with a group of students who had scored in the top 20% on creativity tests, designed by Guilford in the school. They found that that the students whose creativity scores were in the top 20% of the school and whose IQ scores were in the lower 80% performed as well as the students whose IQ scores were in the top 20% of the school and whose creativity scores were in the lower 80%. The highly creative students, albeit scoring on average 5 IQ points lower than the school population as a whole achieved better in academics (Getzel& Jackson, 1962, as cited in Palaniappan, 200,. p. 146). While Getzel and Jackson's study did not help distinguish creativity from intelligence (more on this in Runco, 2006), it did indicate a positive relationship between creativity and academic achievement and it had a large influence on psychologists in the field of education and sprung research on creativity and academic achievement (Ai, 1999).

Getzel and Jackson's study were criticized for its design and methodology and the scales they used (Palaniappan, 2007; Runco, 2006), their results, however, were replicated on different samples (Cicirelli, 1965; Torrance, 1962, as cited in Palaniappan, 2007, p. 146; Yamamoto, 1964). Yet not all research attempting to replicate the Getzel and Jackson study supported the relationship between creativity and academic achievement (Edwards and Tyler, 1965;

Marjoribanks, 1976; Torrance, 1962, as cited in Palaniappan, 2007, p. 146). This contradiction continued in the literature and is characteristic of the recent literature as well, either due to variations in the methods and measurements used or the existence of unmeasured factors moderating the relationship.

The current literature. However, as was mentioned earlier in the introduction, a considerable amount of the more recent literature is moreconsistently pointing to a positive relation between the two constructs across different samples, and using different measures (Ai, 1999).In a sample of 2264 Spanish secondary school students, Ai (1999) found that teachers' ratings of student's creativity were related to students' self-reported grades in Spanish, Basque, English, social sciences, natural sciences, and Math. More specifically, boys rated high in flexibility and elaboration tended to have higher scores in all the 6 subjects, while girls rated high in elaboration and fluency tended to have higher scores in all the 6 subjects. Interestingly, Ai (1999) also measured creativity using the Torrance Test of Creative Thinking (TTCT), the Abedi-Shumachr Creativity Test (CT) and the Villa Auzmendi Creativity Test (VAT) and found that while they were significantly related to students' grades on the six subjects, the relations were very weak. In a smaller sample of 277 German students in grades 9, 10, and 11, Ridermann and Neubauer (2004) used structural equation modeling to examine the relationship between processing speed, intelligence, creativity measured using the Verbal Kreativitats Test (VKT) and the Verwndungs Test (VWT) and academic achievement using final year grades and found that scores on the VKT and VWT correlated with and predicted final year grades, but the relationships were moderate in size. Structural equation modeling was also used by Roke and Kalis (2015) to examine the relation between average school grades and creativity measured using the Creative Thinking – Drawing Production test (CT-DP) in a sample of 180 Latvian

9th graders and found statistically significant moderate correlation between the two measures, with correlations being highest for arts subjects, followed by languages, sciences than humanities.Wallace and Russ (2015) took a both cross-sectional and longitudinal approach when examining the relationship between divergent thinking, its components of originality and fluency, and math achievement in American female students in kindergarten till grade 4 (N=61), and then four years later (N=31). In the cross-sectional analysis they found that divergent thinking was related to mathematical abilities, with fluency being related to mathematical comprehension. In the longitudinal analysis, they found baseline divergent thinking predicted mathematical abilities four years later, and that fluency and originality predicted mathematical comprehension four years later.

Some researchers have also looked at specific aspects of creativity. For example, Ruiz, Bermejo, Ferrando, Prieto,and Sainz (2014) examined intelligence and scientific creative thinking and their relation to academic performance in a sample of 89 Spanish adolescents in secondary school under the premise that creativity is 1) a main component of scientific thinking, 2)essential for the generating of hypotheses and 3) important for adolescents who prefer this type over intelligence. Ruize et al (2014) used the Scientific Creativity Measure (SCT), a factorial intelligence test, and grades of students grouped into three domains: scientific-mathematical, social-linguistic and artistic domains. They found moderate correlations between scientific creative thinking and academic performance, with overall measures of scientific creativity having stronger correlations than the individual facets (fluency, flexibility and originality). Furthermore, scientific creativity predicted academic performance but to a small extent.

Creativity and academic achievement across cultures. Most of these above discussed studies have been conducted on samples of students from American and European countries, i.e.

Western cultures. What about the relationship between creativity and academic achievement in different, non-western cultures? This is the question Palaniappan (2007) aimed to answer in replicating Getzel and Jackson's (1962) study with a sample of 467 grade 10 Malaysian students. Palaniappan (2007) measured intelligence using the Cattel Culture Fair Intelligence Test Scale 2, measured creativity using the figural and verbal versions of the TTCT and used the aggregate of students' grade point average (GPA) as a measure of academic achievement. Based on these measured he divided the students into four groups: high IQ – low creativity (upper 20% on IQ scores but not in the upper 20% on creativity scores), high IQ – high creativity (upper 20% on both creativity and IQ scores), low IQ - high creativity (upper 20% on creativity scores but not in the upper 20% on IQ scores), and the low IQ – low creativity (not in the upper 20% on creativity and IQ scores). Palaniappan (2007) found no significant difference in academic achievement between the high IQ – low creativity and low IQ - high creativity group supporting the contribution of creativity towards academic achievement.

Moreover, this relationship between creativity and achievement did not hold well in a sample of 153 Iranian undergraduate students in Malasyian universities conducted by Naderi, Abdullah, Aizan, Sharir, Kumar (2009). Naderi et al. (2009) found that while age, gender and creativity measured using the Khatena-Torrance Creative Perception Inventory (KTCPI) were significant predictor of students' Cumulative GPA (CGPA) they all in all explained only 14.3% of the variance in CGPA with creativity being the second strongest predictor. However, a stronger relationship was found by Ayverdi, Asker, Öz Aydin, and Saritaş (2014) in a study of the relationship between general creativity, scientific creativity and academic achievement in science and technology courses in a sample of145, 6th to 8th grade Turkish elementary school students. Ayverdi et al (2012) measured creativity using the Divergent Thinking Exercise and the

Williams Scale and measured scientific creativity using the Scientific Creativity Test and found a positive relationship between both creativities and science and technology course scores; in addition, they found that participants with low creativity levels scored significantly lower in science and technology courses than participants with moderate and high creativity levels. Finally, Ghayas and Malik (2013) examined the ability of academic ability to predict creativity in a sample of 300 Pakistani undergraduate students in departments of pure sciences, arts, and social sciences. They found significant correlations between participants' CGPA and the scores on the Abedi Creativity Test; the authors also concluded that academic achievement was a significant predictor of creativity, and explained 12 percent of the variance in creativity scores.

Different perspectives of creativity. The studies presented here on the relationship between creativity and academic achievement have adopted cognitive theories of creativity that considered creativity a cognitive process with some focusing on divergent thinking and others using measures based on the divergent thinking concept. Kaboodi and Jiar (2012) reviewed and compared the relationship between cognitive creativity, i.e., creativity as a mental ability which a person uses to solve a problem and trait creativity, i.e., creativity as a personality characteristic and motivation, and academic achievement. Both authors concluded that while both cognitive and trait creativity correlated with academic achievement, the mean correlation between cognitive creativity and academic achievement was higher than the mean correlation of trait creativity with academic achievement.

The literature on the relationship between creativity and academic achievement indicates the presence of a positive association between the two constructs, with some studies reporting a strong relationship and others a weak one. This positive relationship seems to hold in studies using samples differing in age and culture, different methods of measuring the two constructs,

and different conceptualizations of creativity. The research on the components of creativity (fluency, flexibility and originality) and academic achievement is more limited and less consistently examined. Therefore, in the current study the author expected to find a positive relationship between overall creativity and academic achievement, and aimed to explore the relationship between the components of creativity (fluency, flexibility and originality) and academic achievement.

Creativity and Anxiety

An essential part of being creative is having the ability to deal with uncertainty because novel and creative ventures and endeavors are usually not only associated with excitement but also with anxiety (Carlsson, 2002; Maslow, 1959). It has been proposed that anxiety is not only a part of the creative activity, but also the creative person, in that creative people have higher levels of basal arousal and anxiety than others (Martindale & Armstrong, 1974; Martindale, Anderson, Moore, & West, 1996).

Anxiety−state and trait. Anxiety refers to one's feelings of tension, worry and apprehension, in the face of a perceived psychologically or physically threatening situation (Spielberger, 1972). Typically, researchers differentiate between state, referring to a transitory emotional experience characterized by acute feelings of fear, tension, agitation and apprehension, in response to perceived threats in one's environment, and trait anxiety, referring to one's predisposition to experience state anxiety (Spielberger, 1972). Research indicates that anxiety can have debilitating effects such as inhibiting learning and performance on tasks (Eysenck, Derakshan, Santos, & Calvo, 2007), it can also have facilitating effects such as increasing efforts to accomplish an objective (Elliot & McGregor, 1999).

Anxiety as a correlate of creativity has received considerable research attention, however, most studies have found mixed results concerning the nature of the relationship (Byron & Khazanchi, 2011).

A weak relationship. Some researchers have been skeptical about the relationship between anxiety and creativity and empirically reported no or weak relationships between the two constructs (Schlesinger, 2009). For example, Silvia and Kimbrel (2010), attempted to break down the question of whether mental illness is related to creativity, the so called "mad genius" concept. They examined the relationship between symptoms of anxiety, social anxiety, depression, and several forms of creativity including divergent thinking, creative self-concepts, everyday creative behaviors, and creative accomplishments in a sample of 202 American university students. They measured divergent thinking using three tasks that asked participants to generate unusual, creative and uncommon uses for a brick a box and a knife. The tasks yielded scores on flounce and creativity. They measured creative self-concepts using the Creativity Scale for Different Domains (CSDD), everyday creativity using an abbreviated version of the Creative Behavior Inventory (CBI), creative achievement using the Creative Achievement Questionnaire (CAQ). They also used that Depression and Anxiety subscales of the Depression Anxiety Stress Scales (DASS) to measure depression and anxiety and the Social Interaction Anxiety Scale to measure social anxiety spectrum. Using structural equation methodology, Silvia and Kimbrel (2010) found that anxiety (and depression) explained small amounts of variance, explaining only around 3% of variance in creativity, whether measures as divergent thinking, creative self-concepts, everyday creative behaviors, and creative accomplishments. Furthermore, in most instances, the relationship was positive, while in some instances the relationship seemed to be

negative, as in the case of the relationship between social anxiety and dance (Silvia and Kimbrel, 2010).

A positive relationship. Other researchers have found evidence of a positive relationship between anxiety and creativity. For example, Carlsson et al. (2000), in a physiological examination of the relationship between creativity and hemispheric asymmetry (as measured by cerebral blood flow) also included a measure of anxiety to control for it. A group of 24 male undergraduate students took the Creativity Functioning Test (CFT) and based on their scores were divided into high and low creativity groups; they also took the Spielberg State and Trait Anxiety Inventory (STAI). They found that the high creativity group had higher mean in both state and trait anxiety than the low creativity group. This mean group difference was significant in the case of trait anxiety but not in the case of state anxiety. Furthermore, the cerebral blood flow at resting phase of the high creativity group was significantly higher than the low creativity group, thus providing support to the idea that creative people might have habitual feelings of anxiety and have higher levels of baseline arousal. Similarly, Carlsson (2002) examined differences in anxiety and defense mechanisms in the same sample of undergraduate students grouped into high and low creativity groups. They confirmed the previous findings by Carlsson et al. (2000) that highly creative participants have significantly higher levels of trait, but not state, anxiety than participants with low creativity. Some have argued in the literature that experiences of negative emotions like anxiety may stimulate the need for problem solving and thus motive performance-oriented behaviors, including for example divergent thinking (Byron &Khazanchi, 2011; Martin, Ward, Achee, & Wyer, 1993).

A negative relationship. On the other hand, some other researchers have found a negative relationship between anxiety and creativity. For example, de Acedo-Baquedano and de

Acedo-Lizarrage (2012) examined the relationship between state and trait anxiety and verbal and graphic creativity and examined if the two types of anxiety would predict creativity in a sample of 89 Spanish students (Mage=12.91) in secondary education. They measured anxiety using the STAI and creativity using the Test of Creative Imagination which measures 1) verbal creativity and 3 components of narrative fluidity, flexibility and originality, 2) graphic creativity and four components of originality, elaboration, title and special details, and 3) imagination or creative fantasy. Both authors found that both anxieties were significantly negatively correlated with overall verbal and graphic creativity and imagination, as well as, all the components except for the special details component which did not reach significance. Thus anxiety and creativity were inversely related, anxious participants were less creative and more creative participants were less anxious. Correlations between state anxiety and creativity were moderate while, they were strong in the case of trait anxiety. Finally, both anxieties were weak predictors of creativity, but trait anxiety was a better predictor accounting than state anxiety. The former explained 28% variance in verbal creativity, 17% variance in graphic creativity and 34% in imagination while the latter explained 8% variance in verbal creativity, 11% variance in graphic creativity and 15% in imagination (de Acedo-Baquedano and de Acedo-Lizarrage, 2012).

Baas, De Dreu, and Nijstad (2008) also found similar results in a meta-analysis of 102 effect sizes on the strength and direction of the effect of mood on creative performance. Baas et al. (2008) found that negative activating modes with avoidant motivations; including fear and anxiety, associated with lower creativity, especially when creativity was assessed as flexibility. Byron and Khazanchi (2011) came to a similar conclusion in a meta-analysis of 59 independent samples of the relationship between anxiety and performance on figural and verbal creativity tests. Byron and Khazanchi (2011) found that anxiety was significantly negatively related to

creative performance and that this relationship was moderated by several factors. The relationship was more negative when looking at trait versus state anxiety, when the task was more complex and verbal rather than figural. Byron & Khazanchi (2011) therefore suggested that anxiety had a detrimental effect on creative performance which can potentially be explained by cognitive interference and dual processing models whereby trait anxiety places extra demands on cognitive resources and thus redirects and disrupts cognitive processes required for creative thoughts.

A two component model of anxiety. Furthermore, Byron & Khazanchi (2011) recommended that future research examine creativity in relation to the two component model of anxiety which conceptualizes that anxiety has a debilitating component which interferes with and disrupts performance and a facilitating component which increases stimulation and motivation to perform (Raffety, Smith, & Ptacek, 1997). Little and Wuensch (2015) heeded this recommendation and studied this relationship in a sample of102 university students. They measured the two component model of anxiety using a modified version of the Alpert and Haber (1960) debilitating and facilitating anxiety scale, and they measured creative performance through a caption writing task where participants were asked to provide creative captions to pictures, and the creativity of the captions were judged by two independent rates. Little and Wuensch (2015) hypothesized that debilitating component of anxiety would negatively relate to creative performance on a caption writing task, while facilitating component of anxiety would positively relate to creative performance on a caption writing task. Their first hypothesis was supported, the facilitating component of anxiety correlated significantly with creative performance, and had a positive moderate relationship (r=0.28). Their second hypothesis on the negative relationship between debilitating component of anxiety and creative performance was

not supported. They also found a negative relationship between the two types of anxiety, indicating that they are distinct factors of anxiety (Little & Wuensch, 2015).

Little & Wuensch (2015) suggested that more research needs to be done on the relationship between creativity and anxiety using the two component models of anxiety. As such, the current study took on this call for more research based on Byron & Khazanchi's (2011) recommendation by considering the debilitating and facilitating component of anxiety. In the current study, the author expected to find a positive relationship between facilitating anxiety and creativity as previously demonstrated in the literature. And since debilitating anxiety was found to be negatively related to facilitating anxiety, the author suspected to find a negative relationship between debilitating anxiety and creativity. Further, since the relation of the components of creativity and the two anxiety components were not measured, the current study explored this relationship.

Creativity and Peer Relations

The correlates of creativity reviewed thus far focused on the students' internal state and their school performance, but the author of the current paper was also interested in examining creativity in relation to the students' social life and social experience. On the one hand, creativity is a valued personal and social characteristic (Lau, Li, & Chu, 2004). It has been associated with personality traits such as extraversion and openness (Batey & Furnham, 2006; Silvia & Kimbrel, 2010) that facilitate social and peer interactions. Furthermore, children like peers who can generate novel and useful ideas to solve problems and peers who can generate funny ideas in social interactions (Lau et al., 2004). On the other hand, creative ideas might be judged negatively because people are comfortable with concepts and ideas that they know and are used (Sternberg& Lubart, 1995; as cited in Li, Poon, Tong, & Lau, 2013, p. 617). Creativity in its

nature involves non-conformity and not adhering to rules and norms. Children's non-conforming behavior may be seen as disruptive and non-desirable by peers (Lau et al., 2004). Research on the social experiences and psychological adjustment of creative children has focused on children's' popularity and acceptance by peers, sociability and self-concepts and have measured creativity using psychometric measures, peer nominations of creative peers or teacher nominations and ratings (Li et al., 2013). Though these studies have not tapped into the peer relations concept as conceptualized by the author of this study, they will provide insight into the potential relation between creativity and peer relations, conceptualized as a self-reported assessment of the positive and negative interactions one has with mates of the same age (Naylro, 2011).

The recent literature on the relation between creativity and sociability or peer acceptance and popularity has not focused much on high school students, as such; first an older study that have focused on high school students will be reviewed. Rivlin (1959) examined the differences between creative and non-creative high schools students in terms of their self-attitudes and their sociability. Teachers of 10^{th} and 11^{th} grade students in several students in New York were asked to nominate a handful of students they rated to be creative and handful they rated to non-creative, a total of 126 students were selected. Participants completed a measure of concepts of self and concept of ideal self, a social adjustment measure and were also asked to select students from their grade whom they would like to invite to a party, like to invite to their school club, like to work with on a class committee, and consider most creative (Rivlin, 1959). Creative students compared to non-creative students evaluated themselves more positively on creativity, energy, popularity and shyness. They were also more popular in peer ratings and were perceived to be

more creative then the non-creative group (Rivlin, 1959). Thus indicating that creativity is potentially related to peer acceptance and popularity.

A more recent set of studies has examined peers and teacher evaluations of creative children in younger grade levels as well as creative children's self-evaluations. Since peer evaluations are of greater relevance to the current study than teacher evaluations, the author focused on peer evaluations in reviewing these studies. Lau et al. (2004) examined social and self-perception of high ability children in terms of perceived creativity, peer acceptance and self-concepts. Participants were 31 Chinese students in grades 4 through 7 who were selected to be part of a gifted education program. Participants were asked to name three fellow students they liked the most and the least and to provide peer evaluations on three factors; sociability-leadership, aggressive-disruptive and sensitive-isolated, and to name fellow students who were imaginative and had many creative ideas. Creativity was associated positively with being disliked and not related to being liked. Creativity was also positively related to characteristics of aggressive-disruptive and sensitive-isolated as well as sociability-leadership, which also was a significant predictor of creativity (Lau et al., 2004). Furthermore, creativity was negatively related to participants' self-concept, indicating that creative children might still have low perceptions of themselves even though creativity is a valued trait. Lau et al. (2004) concluded that creative children may generate mixed feelings among their peers and themselves. Li et al. (2013) extended the previous research by examining the relationship between psychological adjustment and creativity and measuring psychological adjustment through individual self-concept, peer rated popularity as well as sociability and measuring creativity using the Wallach–Kogan creativity test in addition to peer ratings. Li et al. (2013) collected data from a group of 53 students who were in a gifted enrichment program (Mage=9.7 years) and based on the creativity

measures grouped them into high and low creativity groups. Li et al. (2013) found that children who were in the high creative group, regardless of the source of creativity information, where better adjusted in terms of sociability and self-concept, but they were perceived by peers to be less popular than their non-creative counterparts. This seems to support Lau et al.'s (2004) conclusion that creative children may generate mixed feelings among their peers.

The importance of sociability and social interactions in creativity was highlighted in a study by Pachucki et al. (2010) investigating college students' perceptions of their creative contributions to campus life. Pachucki et al. (2010) asked 128 participants to keep creative narratives, short descriptions of where and how they felt most creative during their college life and used content analysis to determine themes in participant's narratives. Pachucki et al. (2010) identified six types of creativity: networking, nurturing, gregarious, idealistic, renaissance and social media. The first three, networking which included event planning networking, group activities, nurturing, which involved volunteering, interacting with children, crafts and social time with friends and finally, gregarious which involved conversations and humor and general behavior and disposition, had social under-currents to them (Pachucki et al., 2010). These results indicated the potential association of creativity with social interactions. The relation of sociability to creativity was examined by Ghayas and Malik (2013), in congruence with their examination of the relation between academic achievement and creativity discussed previously. In the sample of 300 undergraduate students, Ghayas and Malik (2013) found a significant positive and moderate correlation between sociability and creativity and found that sociability was a significant predictor of creativity.

The literature on the relationship between creativity and students' social life seems to suggest that students are not necessarily regarded very positively by their peers. The studies in

the literature have not tapped into the peer relations concept as conceptualized by the author of this study; rather they have focused on peer evaluation and acceptance, popularity or sociability. Additionally, most have not examined this relationship in secondary school students; rather they have focused on middle school students and undergraduate samples. Despite these differences, they have provided insight into the potential relation between creativity and peer relations. As such, based on these studies the author of the current study expected to find a positive relationship between creativity and problematic peer relations. Further, the current study explored the relationship between the facets of creativity and peer relations.

Conclusion

The aim of the current study was to examine creativity and its correlates in a sample of Lebanese Armenian secondary school students. In an attempt to take a holistic approach to creativity of students and creativity correlates in students, and based on the literature, three correlates were identified. These were academic achievement, which examines students' performance, anxiety, which examines students' internal state, and peer relations, which examines students' social life. The review of the literature provided insight into the direction and the nature of the relationships to be expected between creativity and these three correlates. In the literature, academic achievement was generally positively related to creativity. Concerning anxiety, the literature suggested examining facilitating and debilitating anxiety which has not received much research attention in relation to creativity. And finally, the scant literature examining the relation of creativity and popularity, acceptance by peers and sociability suggested the presence of a positive relationship. As such, the current study aimed to expand the study of creativity to Lebanon, beginning with Lebanese Armenian secondary school students, and to

contribute to the literature on the relationship of creativity with facilitating and debilitating anxiety and peer relations.

Hypotheses and Research Questions

Based on this review of the literature, the study investigated the following research questions and hypotheses:

Hypothesis 1: There would be a positive association between creative thinking and academic achievement.

Research Question 1: What is the relation between the components of creative thinking and academic achievement?

Hypothesis 2: There would be a positive association between creative thinking and facilitating anxiety.

Hypothesis 3: There would be a negative association between creative thinking and debilitating anxiety.

Research Question 2: What is the relation between the components of creative thinking (fluency, flexibility, and originality) and facilitating anxiety?

Research Question 3: What is the relation between the components of creative thinking (fluency, flexibility, and originality) and debilitating anxiety?

Hypothesis 4: There would be a positive association between creative thinking and problematic peer relations.

Research Question 4: What is the relation between the components of creative thinking and problematic peer relations?

CHAPTER 3

Method

General Perspective

The current study is an empirical quantitative correlational study that examined the relationship between creativity (first dependent variable) and its facets; fluency, flexibility, and originality, and academic achievement (first independent variable), the two components of anxiety; facilitating anxiety (second independent variable) and debilitating anxiety (third independent variable) and peer relations (fourth independent variable).

Research Context

Creativity has been shown to have benefits to school students on many levels. These benefits have included person benefits such as motivating students and helping them structure and find meaning in their lives (Annarella, 1999, as cited in Craft, 2001, p. 11). These benefits also include the social level such as fostering team work, cultural level such as promoting cultural change and economical level such as promoting a culture adapts to change (Craft, 2001). As such, much of the creativity research has focused on schools and school students, and education policy, especially in developed countries, has shifted towards making creativity a core component of formal education (Shaheen, 2010). This has been least prominent in developing countries such as Lebanon, where creativity in formal education remains relatively neglected and creativity research in school students is scarce (Shaheen, 2010). As such, the current study examined creativity in Lebanese Armenian schools as a starting point, specifically secondary school students, because the available literature on this topic has also focused on high school and undergraduate college students per se. ,

Participants

The participants for this study were a convenient sample of Lebanese Armenian school students in grades 10, 11, and 12 who agreed to participate. A total of 141school students, between the ages of 14and 19 of both genders from four private Lebanese Armenian schools participated in the current study. These four schools incorporate grade levels from Kindergarten (KG1) to grade 12 (Lebanese Baccalaureate), and include a student body ranging from around 125 to 600 with students from diverse socioeconomic statuses. While the curriculum is similar across the four schools, the primary language of education is French in one and English in the rest. However, all participants were able to understand the English questionnaires without any difficulty. Furthermore, three of the schools are religious while the fourth is not.

Materials

Data were collected using a questionnaire booklet which included a demographics questionnaire and three instruments measuring creativity, anxiety and peer relations, while academic achievement was measured through students' self-report of their final year grades from last year.

Demographics Questionnaire and Academic Achievement measure. The demographics questionnaire asked about the participants' gender, age, nationality, and grade level. It also included a question related to whether participants agreed that the investigator uses their final grades in the research (see Appendix C). If participants agreed, they were asked to report their final average grades from last year.

Creative thinking Measure. To measure creative thinking the author of this study relied on the instrument used by Roue (2011), who based their instrument on the Wallach and Kogan Creativity Test (WKCT, Wallach & Kogan, 1965[see Appendix D]).The WKCT has both verbal

and figural components, but Roue (2011) used only the verbal component of the WKCT, and thus the measure has three verbal test sections of instances, similarities and uses. Each section has three questions. In the instances section participants are asked to generate as many instances as they can of an everyday object or concept. In the similarities section participants are asked to list similarities of two everyday objections. Finally, in the uses section, participants are asked to come up with possible uses of an object (Roue, 2011). Responses to each of the questions in the section are measured for: originality, flexibility and fluency (Roue, 2011; Wallach & Kogan, 1965). Roue (2011) used three judges from different backgrounds to judge the originality and flexibility of the participant's answers. In the current study two judges scored the questionnaire simultaneously; and the scores of originality, flexibility and fluency were obtained by averaging the scores of the two judges. While Roue (2011) had given participants a time limit they stated that this might be a limitation and thus there was no time limit in the current study. The test has good psychometric properties (Roue, 2011), with good construct validity (Wallbrown, Wallbrown, & Wherry, 1975), and inter-rater reliabilities of .80 and above (Roue, 2011).

Debilitating and facilitating anxiety Measure. The Alpert Haber Achievement Anxiety Test (AAT; Alpert & Haber, 1960[see Appendix D]) was used to measure debilitating and facilitating anxiety. The AAT is a 19 item questionnaire with two sub-scales. The facilitating anxiety sub-scale is a 9 item scale measuring how test anxiety improves student performance. The debilitating anxiety sub-scale is a 10 item scale measuring how much anxiety interferes with student performance (Alpert & Haber, 1960; Moyer, 2008). Each item is followed by several alternatives that describe participants' potential experiences and attitudes and asks participants to choose the alternative that reflects them most closely (Alpert & Haber, 1960; Moyer, 2008) .The

scale has been found to be reliable with a test retest reliability of .75 for the facilitating scale and .76 for the debilitating scale over an 8 month period (Alpert & Haber, 1960).

Peer relations Measure. The Index of Peers Relations (IPR; Hudson, 1997) was used to measure peer relations(see Appendix D). The IPR is a 25 item scale designed to measure problems participants have with peers, that can be used either as a global measure of peer relationship problems or a measure of relationship problems with specific peer groups (Corcoran & Fischer, 2013). Items are rated on 5 point Likert type scale with higher scores indicating more problems. The scale is highly reliable with an internal consistency of α=.94 (Corcoran & Fischer, 2013).

Research Design

The current study is a quantitative correlation study based on self-report measures. The SPSS Version 21 software was used to analyze the collected data. Pearson's correlation was used to examine the hypothesis.

Procedures

First, the school principals were contacted through telephone by the investigator and were invited to allow their students to participate in the study. The investigator explained the aim, rationale and design of the study to the principles. Two of the school principals required a meeting prior to the data collection to get a better understanding of the study, while the others allowed the author to collect data from students based on the telephone call. The author offered distributing a parental consent and a student assent form, but one person rejected the idea and the others did not require these forms as such they were not distributed. Upon coordinating with the schools, the author went to the classrooms briefly explained the aim of the study and distributed the questionnaire to the students willing to participate. The investigator assured that the study

was anonymous, no names and no identifiers were required for the questionnaires. The data were also confidential, only the investigator and a judge had access to the data. The same procedure and explanation was given across classrooms, grades and schools. Students took approximately 45 to 60 minutes to fill the questionnaire.

Data Analysis

The collected data were entered into the SPSS software for statistical analysis. In terms of the scoring of the instruments, creativity was scored by the investigator and another judge (a male graduate in clinical psychology). The following scoring method was followed: for every question the two judges together recorded all the answers of all the students on a sheet of paper then, they created a table of categories out of the answers of the students. Then they assigned for each answer a category, and also calculated the number of times each answer was given by students. To calculate the fluency score for each question, they added the number of answers the student has. To calculate the flexibility score for each question, they calculated the number of categories of the answers of the student for each question. To calculate the originality score for each question, plus 1 was given to each answer that was original (mentioned seven times or less by all 143 participants). Finally, after scoring every question, the judges together calculated the total flexibility, originality and fluency by adding the sum of each answer.

To score the two components of anxiety, facilitating and debilitating, the sum of the items of the each component was calculated. The 9 items (2, 6, 8, 9, 10, 12, 15, 16, 18) were added to create the facilitating anxiety component with items 2, 6, 9, 15, 16, 18 were reverse coded, and the 10 items (1, 3, 4, 5, 7, 11, 13, 14, 17, 19) were added to create the debilitating anxiety component with items 1, 5, 7, 11, 14 were reverse coded.

Concerning the Peer scale, items 2, 3, 5, 6, 9, 10, 13, 14, 19, 20, 23, 24, 25 were reverse coded. The total score of the peer scale was computed using the following formula: S = (summation of X – N)/ (N*4), where X is the score on an item and N is the total number of items correctly completed by the participant; omitted items and items scored outside the range from 1 to 5 are ignored. This scale has a cutoff score of 35 above which the individual has clinically significant peer relation problems.

The reliability of the scales, the Index of Peers Relations (Hudson, 1997) and debilitating and facilitating anxiety the components of the Alpert Haber Achievement Anxiety Test (Alpert & Haber, 1960) was examined using Chronbach's alpha (α). All the hypotheses were tested using the Pearson correlation coefficient (r).

CHAPTER 4

Results

A. Reliability Testing

To determine the internal consistency of the each scale, Cronbach alpha was calculated for the Alpert Haber Achievement Anxiety Test (Facilitating Anxiety Subscale and Debilitating Anxiety Subscale) and the Index of Peers Relations (IPR). The cronbach alpha for all scales was considered acceptable, being above 0.5, in comparison to previous studies. Consequently, these three scales were considered for use in further analysis. The table below presents a comparison between alpha coefficients from previous studies and alpha coefficients from the current study (Table 1).

Table 1
Cronbach Alpha of the Alpert Haber Achievement Anxiety Test- Facilitating Anxiety Subscale and Debilitating Anxiety Subscale and the Index of Peers Relations (IPR) scale.

Scale	Previous Cronbach's Alpha	Current Cronbach's Alpha
The Alpert Haber Achievement Anxiety Test - Facilitating Anxiety Subscale	0.75	0.51
The Alpert Haber Achievement Anxiety Test - Debilitating Anxiety Subscale	0.76	0.74
The Index of Peers Relations (IPR)	0.94	0.94

B. Preliminary Analysis

Preliminary analyses were conducted prior to examining the main analyses. The preliminary analyses involved missing values analysis and analysis of univariate and multivariate outliers

1. Missing Value Analysis.

Missing value analysis was conducted on the final sample of 141 participants. The missing value analysis revealed that all the variables had less than 5% missing values except for the academic achievement (30.5%), Gender (5.0%), nationality (15.6%), Index for Peer Relations item 6 (6.4%), and the question on whether students allow the principal investigator to review the grades of them (7.8%). The little's MCAR test was conducted to test whether the data were missing completely at random. The statistically significant result of the little's MCAR test revealed that MCAR (Missing Completely at Random) cannot be inferred; X^2 (1444); p = .002. The data were not missing at random and could cause potential distortions in the final analysis. Therefore, fifteen t-tests were run for the outcome variable creative thinking with the three scales (fluency, flexibility and originality). The variables (academic achievement, gender, nationality, Index of Peer Relations item 6, and the item on whether students allow the principal investigator to review the grades of them) that had missing values above 5% were recoded. The ranges of acceptable values were coded into 1 and the missing values were coded into 2. These two groups were compared on the outcome variable creative thinking with the three scales (fluency, flexibility and originality) using fifteen independent samples t-test. The results revealed that there were no significant differences on the three scales (fluency, flexibility and originality) between participants who had left missing data and those who had not left missing data. Therefore, participants who left questions unanswered where not significantly different from those who answered the questionnaire in its entirety.

2. Univariate and Multivariate Outliers.

Univariate outliers were inspected using Z-scores and 4 common univariate outliers were found with Z-scores above ±3.29 standard deviations. One univariate outlier was found on the variable facilitating anxiety with case number 22. Three univariate outliers were found on the outcome variable (fluency) with case numbers 56, 58, 80, one univariate outlier was found on the outcome variable (flexibility) with case number 80 and three univariate outliers were found on the outcome variable (originality) with case numbers 56, 58, and 80. It is notable, overall, 4 cases of univariate outliers were inspected with case numbers 22, 56, 58, 80. Multivariate outliers were inspected through Mahalanobis distance using SPSS syntax. One case was found to be a multivariate outlier, $\chi 2\ (4) = 21.83$, $p < .01$, with case number 101. It was notable all cases of univariate and multivariate outliers were retained in the final analysis because no cases were found to be both univariate and multivariate outliers at the same time.

3. Sample Characteristics and Demographics.

The final sample ($N = 141$) included 63 (47.0%) males and 71 (53.0%) females. The age of students ranged between 14 and 19 with Mean $M = 16.03$ years ($SD = 1.09$; Table 2). The majority of students were Lebanese (75.6%), followed by Lebanese Armenian nationality (10.8%), Syrian nationality (6.7%) and Armenian nationality (3.4%). The rest of participants were distributed among four nationalities; Syrian Armenian, American, Greek and Canadian (0.8% each). Concerning the grade level of participants, the majority of participants were in Grade 10 (42.3%) followed by Grade 11 (31.4%) and Grade 12 (25.5%). Finally, the majority of participants (70.8%) asserted that they allow the principal investigator of this study to review

their total grades, whereas 29.2% of participants didn't approve allowing the principal investigator to review their total grades (Table 3).

Table 2

Descriptive of the Age of Participants

Demographics	N	Minimum	Maximum	Mean	Standard Deviation
Age	136	14.00	19.00	16.03	1.09
Valid N (listwise)	136				

Table 3

Descriptives of the Gender, Nationality, and Grade level of the participants

		N	%
Gender	Male	63	47.0%
	Female	71	53.0%
Nationality	Lebanese	90	75.6%
	Syrian	8	6.7%
	Lebanese Armenian	12	10.9%
	Armenian	4	3.4%
	American	1	.8%
	Canadian	1	.8%
	Greece	1	.8%
	Syrian Armenian	1	.8%
Grade Level	Grade 10	58	42.3%
	Grade 11	43	31.4%
	Grade 12	36	26.3%
Allow principal investigator to review your total grades	Yes	92	70.8%
	No	38	29.2%

4. Scale Descriptives

The means and standard deviations of the scales were calculated. Concerning the outcome variable creative thinking (fluency, flexibility and originality), it seems that on average participants reported lower levels of fluency (*M* = 19.32, *SD* = 10.56), flexibility (*M* = 13.39, *SD* = 4.80) and originality (*M* = 7.42, *SD* = 6.91). Concerning academic achievement, it seems that on average participants had higher levels of academic achievement (*M* = 72.51, *SD* = 8.70). Concerning the anxiety scales, on average participants had lower levels of facilitating anxiety (*M* = 26.66, *SD* = 5.28) and debilitating anxiety (*M* = 28.43, *SD* = 6.50). Finally, concerning the peer relations scale, participants reported low levels of problematic peer relations (*M* = 25.76, *SD* = 18.54; Table 4)

Table 4

Scale Descriptives of the scores of age, total grade, facilitating anxiety, debilitating anxiety, peer scale, fluency, flexibility and originality of the participants

	N	Minimum	Maximum	Mean	Std. Deviation
Age	137	12.00	19.00	16.00	1.14
Total Grade	98	52.90	92.50	72.51	8.70
Facilitating Anxiety	141	11.00	45.00	26.66	5.28
Debilitating Anxiety	141	10.00	45.00	28.43	6.50
Peer Scale	141	.00	85.00	25.76	18.54
Fluency	141	.00	65.00	19.32	10.56
Flexibility	141	.00	30.00	13.39	4.80
Originality	141	.00	49.00	7.42	6.91
Valid N (listwise)	98				

C. Hypothesis Testing

1. Correlation between Predictor Variables and Creative thinking

The Spearman rho's[1] correlation test was conducted to investigate the relations between the predictor variables (Academic Achievement, Facilitating Anxiety, Debilitating Anxiety and Peer Relations) and the three measures of creative thinking (fluency, flexibility and originality).

The Spearman's rho correlation test revealed that there were significant positive and small to medium correlations between academic achievement and the three measures of creativity (fluency, flexibility and originality); $r_s = .25$, $p = .007$ (*one-tailed*), $r_s = .23$, $p = .012$ (*one-tailed*), $r_s = .22$, $p = .014$ (*one-tailed*) respectively. Therefore, students who had higher levels of academic achievement tended to have higher levels of creative thinking as measured by the three measures fluency, flexibility and originality.

The Spearman's rho correlation test also revealed that there were significant positive and small to medium correlations between facilitating anxiety and the three measures of creativity (fluency, flexibility and originality); $r_s = .18$, $p = .018$ (*one-tailed*), $r_s = .17$, $p = .025$ (*one-tailed*), $r_s = .18$, $p = .018$ (*one-tailed*) respectively. Therefore, students who had higher levels of facilitating anxiety tended to have higher levels of creative thinking as measured by the three measures fluency, flexibility and originality.

The Spearman's rho correlation test revealed that there were no significant correlations between debilitating anxiety and the three measures of creativity (fluency, flexibility and

[1] The spearman rho's test was conducted because the normality of the variables fluency, flexibility and originality was not met.

originality); r_s = -.01, p = .449, *ns* (*one-tailed*), r_s = -.08, p = .177, *ns* (*one-tailed*), r_s = -.04, p = .340, *ns* (*one-tailed*) respectively.

Finally, the Spearman's rho correlation test also revealed that there were significant positive and small to medium correlations between peer relations and two measures of creativity (fluency, and flexibility); r_s = .17, p = .019 (*one-tailed*), r_s = .14, p = .045 (*one-tailed*). The Spearman's rho correlation test, however, revealed that there was no significant correlation between peer relations and the measure of creativity (originality); r_s = .13, p = .058, *ns* (*one-tailed)*. Therefore, students who had higher levels of problematic peer relations tended to have higher levels of creative thinking as measured by the two measures fluency and flexibility (Table 5).

Table 5

Value of Correlations between measures of creative thinking (fluency, flexibility and originality) and academic achievement, facilitating anxiety, debilitating anxiety and peer relations

	Fluency	Flexibility	Originality
Academic Achievement	.25**	.23*	.22*
Facilitating Anxiety	.18*	.17*	.18*
Debilitating Anxiety	-.01	-.08	-.04
Peer Relations	.17*	.14*	.13

*. Correlation is significant at the 0.05 level (one-tailed).

**. Correlation is significant at the 0.01 level (one-tailed).

2. Regression Analysis: Predictors of Creative Thinking as Measured by Fluency Scale

A multiple regression analysis was conducted using the forced entry method. The outcome variable was creative thinking as measured by fluency scale and the predictor variables were academic achievement, facilitating anxiety, debilitating anxiety, peer relations.

The F-test revealed that the regression model which contained the predictors (academic achievement, facilitating anxiety, debilitating anxiety and peer relations), and which was forced into the regression equation, was significantly better than the mean in explaining the variance in the outcome variable (fluency), F (4, 93) = 5.27, p = .001.

The regression model which contained the predictors (academic achievement, facilitating anxiety, debilitating anxiety and peer relations) explained 18.5% (R^2= .185) of the variance of the outcome variable (fluency). The adjusted R square for this regression model was R^2adj= .15, indicating that this regression model explained 15.0% of the variance of the outcome variable (fluency) at the level of the population. In addition, when moving from the sample to the population, the shrinkage was ΔR^2 = 3.5%; indicating that this regression model would generalize well to the population (Table 6).

Table 6

R, R Square, Adjusted R Square of the fluency regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.43	.185	.150	9.88	.185	5.27	4	93	.001	1.81

By inspecting the table of coefficients; the t-tests revealed that among the four predictors, only the predictors (academic achievement and peer relations) were found to be significant predictors of the outcome variable (fluency). Among the two significant predictors, peer relations was the highest predictor of fluency followed by academic achievement.

The t-test revealed that peer relations was a significant positive and small to medium predictor of the fluency scale; b = .16, β = .29, t (93) = 3.00, p = .003. This indicates that students who had higher levels of problematic peer relations tended to have higher levels of creative thinking as measured by fluency scale.

The t-test also revealed that academic achievement was a significant positive and small to medium predictor of the fluency scale; b = .28, β = .23, t (93) = 2.22, p = .029. This indicates that students who had higher levels of academic achievement tended to have higher levels of creative thinking as measured by fluency scale (Table 7).

Table 7
Value of regression parameters of the predictors of fluency;academic achievement, facilitating anxiety, debilitating anxiety and peer relations

Model		***B***	***SE B***	***β***
1	(Constant)	-18.50	13.90	
	Academic Achievement	.28	.13	.23*
	Facilitating Anxiety	.39	.20	.20
	Debilitating Anxiety	.11	.20	.06
	Peer Relations	.16	.05	.29**

Note: For model 1; R^2 = .185, ΔR^2 = .35, * p < .05, ** p < .01

3. Regression Analysis: Predictors of Creative Thinking as Measured by Flexibility Scale

A multiple regression analysis was conducted using the forced entry method. The outcome variable was creative thinking as measured by flexibility scale and the predictor variables were academic achievement, facilitating anxiety, debilitating anxiety, peer relations.

The F-test revealed that the regression model which contained the predictors (academic achievement, facilitating anxiety, debilitating anxiety and peer relations), and which was forced into the regression equation, was significantly better than the mean in explaining the variance in the outcome variable (flexibility), F (4, 93) = 4.19, p = .004.

The regression model which contained the predictors (academic achievement, facilitating anxiety, debilitating anxiety and peer relations) explained 15.3% (R^2= .153) of the variance of the outcome variable (flexibility). The adjusted R square for this regression model was R^2adj= .116, indicating that this regression model explained 11.6% of the variance of the outcome variable (flexibility) at the level of the population. In addition, when moving from the sample to the population, the shrinkage ΔR^2 = 3.7%; indicating that this regression model would generalize well to the population (Table 8).

Table 8

R, R Square, Adjusted R Square of the flexibility regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.39	.153	.116	4.43	.153	4.19	4	93	.004	1.78

By inspecting the table of coefficients; the t-tests revealed that among the four predictors, only the predictors (academic achievement and peer relations) were significant predictors of the outcome variable (flexibility). Both significant predictors (academic achievement and peer relations) had equal predictive value of the outcome variable (fluency).

The t-test revealed that Academic achievement was a significant positive and small to medium predictor of the fluency scale; b = .13, β = .23, t (93) = 2.21, p = .030. This indicates that students who had higher levels of academic achievement tended to have higher levels of creative thinking as measured by flexibility scale.

The t-test also revealed that peer relations was a significant positive and small to medium predictor of the fluency scale; b = .06, β = .23, t (93) = 2.39, p = .019. This indicates that students who had higher levels of problematic peer relations tended to have higher levels of creative thinking as measured by flexibility scale (Table 9).

Table 9
Value of regression parameters of the predictors of flexibility ;academic achievement, facilitating anxiety, debilitating anxiety and peer relations

Model		***B***	***SE B***	***β***
1	(Constant)	-2.00	6.24	
	Academic Achievement	.13	.06	.23*
	Facilitating Anxiety	.16	.09	.18
	Debilitating Anxiety	.03	.09	.04
	Peer Relations	.06	.02	.23*

Note: For model 1; R^2 = .153, ΔR^2 = .37, * p < .05

4. Regression Analysis: Predictors of Creative Thinking as Measured by Originality Scale

A multiple regression analysis was conducted using the forced entry method. The outcome variable was creative thinking as measured by originality scale and the predictor variables were academic achievement, facilitating anxiety, debilitating anxiety, peer relations.

The F-test revealed that the regression model which contained the predictors (academic achievement, facilitating anxiety, debilitating anxiety and peer relations), and which was forced into the regression equation, was significantly better than the mean in explaining the variance in the outcome variable (originality), F (4, 93) = 4.79, p = .001.

The regression model which contained the predictors (academic achievement, facilitating anxiety, debilitating anxiety and peer relations) explained 17.1% (R^2= .171) of the variance of the outcome variable (originality). The adjusted R square for this regression model was R^2adj= .135, indicating that this regression model explained 13.5% of the variance of the outcome variable (originality) at the level of the population. In addition, when moving from the sample to the population, the shrinkage ΔR^2 = 3.6%; indicating that this regression model would generalize well to the population (Table 10).

Table 10

R, R Square, Adjusted R Square of the originality regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.41	.171	.135	6.82	.171	4.79	4	93	.001	1.95

By inspecting the table of coefficients; the t-tests revealed that among the four predictors, only the predictors (academic achievement and peer relations) were significant predictors of the outcome variable (originality). Among the two significant predictors, peer relations was the highest predictor of originality, followed academic achievement.

The t-test revealed that peer relations was a significant positive and small to medium predictor of the fluency scale; b = .11, β = .29, t (93) = 3.02, p = .003. This indicates that students

who had higher levels of problematic peer relations tended to have higher levels of creative thinking as measured by originality scale.

The t-test also revealed that Academic achievement was a significant positive and small to medium predictor of the originality scale; $b = .18$, $\beta = .21$, $t\ (93) = 2.02$, $p = .047$. This indicates that students who had higher levels of academic achievement tended to have higher levels of creative thinking as measured by originality scale (Table 11)

Table 11
Value of regression parameters of the predictors of originality; academic achievement, facilitating anxiety, debilitating anxiety and peer relations

Model		***B***	***SE B***	***β***
1	(Constant)	-10.97	9.60	
	Academic Achievement	.18	.09	.21*
	Facilitating Anxiety	.18	.14	.13
	Debilitating Anxiety	-.06	.13	-.05
	Peer Relations	.11	.04	.29**

Note: For model 1; $R^2 = .171$, $\Delta R^2 = .36$, * $p < .05$, ** $p < .01$

D. Conclusion

Hypothesis 1: There would be a positive association between academic achievement and creative thinking.

The results of the Spearman's rho correlation test revealed that that academic achievement was a significant positive correlate with three measures of creative thinking (fluency, flexibility, originality [Table 5]). Moreover, the results of the three regression analysis revealed that academic achievement was a significant positive predictor of the three measures of

creative thinking (fluency, flexibility and originality [Tables 7, 9 and 11]). Therefore, hypothesis 1 was supported.

Hypothesis 2: There would be a positive association between facilitating anxiety and creative thinking.

The results of the Spearman's rho correlation test revealed that facilitating anxiety was a significant positive correlate with three measures of creative thinking (fluency, flexibility, originality [Table 5]). The results of the three regression analysis, however, revealed that facilitating anxiety was not a significant predictor of the three measures of creative thinking (fluency, flexibility and originality [Tables 7, 9 and 11]). Therefore, hypothesis 2 was supported, based on the results of the Spearman's rho correlation test.

Hypothesis 3: There would a negative association between debilitating anxiety and creative thinking.

The results of the Spearman's rho correlation test revealed that debilitating anxiety was not found to be a significant correlate with three measures of creative thinking (fluency, flexibility, originality [Table 5]). The results of the three regression analysis, similarly, revealed that debilitating anxiety was not a significant predictor of the three measures of creative thinking (fluency, flexibility and originality [Tables 7, 9 and 11]). Therefore, hypothesis 3 was not supported.

Hypothesis 4: There would be a positive association between problematic peer relations and creative thinking.

The results of the Spearman's rho correlation test revealed that peer relations was found to be a significant correlate with the two measures of creative thinking (fluency and flexibility

[Table 5]). Moreover, the results of the three regression analysis revealed that peer relations was found to be a significant predictor of the three measures of creative thinking (fluency, flexibility and originality [Tables 7, 9 and 11]). Therefore, hypothesis 4 was supported.

E. Additional Analysis: Gender and Creative Thinking

Three independent t-tests were conducted to investigate the gender differences among the three creativity measures (fluency, flexibility and originality).

On average, female participants (M = 20.65, SD = 9.33) had higher levels of creativity as measured by fluency compared to males (M = 18.35, SD = 12.11). This difference, however, was not found significant by the independent t-test; t (132) = -1.24, p = .218, *ns*.

On average, female participants (M = 14.32, SD = 4.28) had higher levels of creativity as measured by flexibility compared to males (M = 12.67, SD = 5.32). This difference was found significant by the independent t-test; t (132) = -2.00, p = .048. This difference had small to medium effect size; r = .17

Finally, on average, male participants (M = 7.73, SD = 8.24) had higher levels of creativity as measured by originality compared to females (M = 7.31, SD = 5.84). This difference, however, was not found significant by the independent t-test; t (132) = .34, p = .732, *ns* (Table 12).

Table 12

Gender Differences in fluency, flexibility, and originality

	t-test for Equality of Means						
	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Fluency	-1.24	132	.218	-2.30	1.86	-5.97	1.37
Flexibility	-2.00*	132	.048	-1.66	.83	-3.30	-.014
Originality	.34	132	.732	.42	1.22	-2.00	2.84

*$p < .05$

CHAPTER 5

Discussion

The aim of this study was to investigate the relationships between the independent variables (academic achievement, facilitating anxiety, debilitating anxiety, and peer relations) and the dependent variable (creativity) in a convenient sample of 141 students in grades 10, 11, and 12 drawn from four Armenian Secondary schools. This aim was viewed as important given the scant literature on creativity among school students in the Arab world generally and in Lebanon specifically. Moreover, research has highlighted the importance of fostering creativity in schools and has shown that creativity has benefits at the personal level, social level, cultural level, and economical level. This study endeavored a holistic approach in the understanding of creative thinking in students; by examining the relationship between the students' performance (academic achievement), the students' internal state (facilitating and debilitating anxiety), the students' social life (peer relations) and creativity.

A. Interpretations of the Findings

The main findings of this study were that academic achievement was found to be a significant positive correlate and predictor of the three measures of creative thinking (fluency, flexibility and originality). Moreover, facilitating anxiety was found to be a significant positive correlate with the three measures of creative thinking (fluency, flexibility and originality). In addition, problematic peer relations was found to be a significant positive correlate and predictor of the two measures of creativity thinking (fluency and flexibility), and a significant positive predictor of the third measure of creativity (originality). It is notable that in the regression analyses of the predictors of fluency and originality, and among the two significant predictors

(academic achievement and problematic peer relations), problematic peer relations was found to be the highest predictor of both fluency and originality, followed by academic achievement. In the regression analysis of the predictors of flexibility, both significant predictors (academic achievement and peer relations) had equal predictive value of flexibility. Finally, on average female participants had higher levels of creativity as measured by the flexibility scale compared to males. No gender differences, however, were found among the two other measures of creative thinking (fluency and originality).

The first hypothesis that there is a positive association between academic achievement and creative thinking was supported. As such, academic achievement was found to be a significant positive correlate and predictor of the three measures of creative thinking (fluency, flexibility and originality). This indicated that students who had higher levels of academic achievement tended to have higher levels of creative thinking. One might argue that participants who had higher levels of academic achievement tended to have higher levels of scientific thinking which is a main component of creativity as indicated by Ruiz et al. (2014). This finding support previous literature on the positive association between creative thinking and academic achievement (Ai, 1999; Ayverdi et al, 2012; Ghayas & Malik, (2013), Naderi et al., 2009; Palaniappan, 2007; Ridermann & Neubauer, 2004; Roke & Kalis, 2015). Furthermore, these findings contribute to the literature on the relationship between creativity and academic achievement in two ways. First, the findings contribute to answering the question put forth by Palaniappan (2007) concerning the relation between creativity and academic achievement in different, non-western cultures, by finding a positive relationship in a Lebanese Armenian sample of students. Thus, this study contributes to studies by Ayverdi et al (2012), Ghayas and Malik, (2013), Naderi et al. (2009), and Palaniappan, (2007) in extending the examination of the

relationship between the two constructs in Lebanon and in Lebanese Armenian students specifically. Second, the findings add to the recent collection of studies that has more steadily been finding positive relations between the two constructs (Ai, 1999; Ayverdi et al, 2012; Ghayas & Malik, (2013), Naderi et al., 2009; Palaniappan, 2007; Ridermann & Neubauer, 2004; Roke & Kalis, 2015). Thus contributing to potentially undermining studies that had found and advocated for a weak or no relationship between creativity and academic achievement (Edward & Tyler, 1966, as cited in Roke & Kalis, 2015; Kim & Michael, 1995), and contributing to the potential settlement of this long debate (Ai, 1999) of the nature of the relationship between the two constructs in favor for the existence of a positive relationship.

The facets of creativity; fluency, flexibility and originality, have not been widely studied in the literature, as has creativity in general. Wllace and Russ (2015) for example in their study found that fluency was related to mathematical comprehension in a sample of female students in Kindergardens till grade 4. Four years later, they found that fluency and originality predicted mathematical abilities. Hansenne and Legrand (2012) found figural fluency, figural flexibility, figural originality and verbal flexibility predicted school grades in 9 to 12 year old children. The findings of Hansene and Legrand (2012) study are most similar to findings of Niaz, de Nunez, and de Pineda (2000) who found flexibility, fluency and originality moderately predicted high school students' school grades. This variability of findings can be due to the different instruments used to measures of both creativity and academic achievement (Ai, 1999), and only though the replication of results using the same instruments can we systematically and consistently determine the nature of the creativity facets with academic achievement. The second hypothesis that there is a positive association between facilitating anxiety and creative thinking was supported. As such, facilitating anxiety was found to be a significant positive correlate with

the three measures of creative thinking (fluency, flexibility, and originality). This indicated that students who had higher levels of facilitating anxiety tended to have higher levels of creative thinking. To our knowledge this is only the second examination of this relationship in the literature and the findings of this study supported the previous study conducted by Little and Wuensch (2015) and their finding of a positive association between facilitating anxiety and creative thinking. Furthermore, the current study replicated and extended Little and Wuensch's (2015) findings in a sample of high school students (versus undergraduate students), and using a different measure of creativity thinking, potentially implying that the relationship between facilitating component of anxiety and creativity may hold across different samples and using different measures. Moreover, this is the first study to look at the relationship between facilitating component of anxiety and creativity in terms of the three facets of creativity and to find a positive relationship. Given that there is no other literature on this; the results have to be replicated before any conclusions can be made. It is conceivable that anxiety facilitates creativity through a process by which anxiety stimulates the need for problem solving and motivates performance-oriented behavior and as such leads to higher levels of creative thinking (Martin et al., 1993; Rafetty et al., 1997).

The third hypothesis that there is a negative association between creative thinking and academic achievement was not confirmed. As such, debilitating anxiety was not found to be significantly related to the three measures of creative thinking (fluency, flexibility and originality).The author of the current study had expected to find a negative relationship between these two constructs because Little and Wuensch (2015) had found a negative relationship between facilitating and debilitating anxiety and because a considerable amount of studies in the literature on the relationship between state-trait anxiety and creativity have found a negative

relationship between state anxiety and creativity, pointing to the potential debilitating effect of anxiety on creativity (Byron & Khazanchi, 2011). The findings that debilitating anxiety is not significantly related to creativity though surprising is not unprecedented. It actually supports Little and Wuensch's (2015) null finding on the association between debilitating anxiety and creative thinking. One might argue that the absence of relation between debilitating anxiety and creative thinking was attributed to social desirability; on average participants had low levels of debilitating anxiety. It is conceivable that students' answers on the debilitating anxiety scale didn't reflect their actual levels of stress and distraction (debilitating anxiety) that are highly present in academic settings. The findings of the current study and that of Little and Wuensch's (2015) of a positive relationship between facilitating anxiety and creativity and no relationship between debilitating anxiety and creativity taken together could, however, potentially imply that the debilitating component of anxiety is not as prominent as its facilitating component and while anxiety may interfere with and disrupt performance, its effects as a motivator and stimulator of performance may be stronger.

The fourth hypothesis that there is a positive association between problematic peer relations and creative thinking was supported. As such, peer relations was found to be a significant positive correlate and predictor of the two measures of creativity thinking (fluency and flexibility), and a significant positive predictor of the third measure of creativity (originality). This indicated that students who had higher levels of peer relations problems tended to have higher levels of creative thinking and that creative fluency, flexibility and originality significantly and positively predict problematic peer relations. This is the first study to examine the relation between creativity and its facets and self-reported peer relations. The findings of this examination are more in line with the findings on creativity and peer acceptance by Lau and Li

(1996), Lau, et al., 2004, and Li et al., (2013) who have found that creative children generate mixed feelings and are not necessarily liked and accepted by their peers. Creativity in its nature involves non-conformity and not adhering to rules and norms. It is conceivable that students who had higher levels of creative thinking display more non-conforming and disruptive behaviors which are seen as non-desirable by peers and lead to problematic peer relations (Lau et al., 2004). Furthermore, since people are comfortable with concepts and ideas that they know and are used, creative ideas might be judged negatively by peers and consequently a creative students may be judged negatively for his/her ideas ans have problematic peer relationships (Sternber & Lubart, 1995; as cited in Li, Poon, Tong, & Lau, 2013).

The results of the independent sample t-tests revealed that on average, female participants tended to have higher levels of creative thinking compared to males as measured by the flexibility scale only. Gender differences, however, did not exist among the two other measures of creative thinking (fluency and originality). The research on gender differences in creativity has been substantial but not without considerable controversy and confusion because of the heterogeneity in the results (Abraham, 2015). Some studies have reported that males and females do not differ on measures of creativity (Cheung, Lau, Chan, & Wu, 2004; Roue, 2011; Rudowicz, 2004; Urban and Jellen, 1996). For example, Roue (2011) examined gender differences in divergent thinking of 166 students in grades 8 and 11 in a school in the United States and found no gender differences in divergent thinking or the three facets. Some other studies, on the other hand, have found differences between boys and girls either in creativity in general or specific facets of creativity or tasks measuring creativity, however, without any consistency of findings (Kousoulas & Mega, 2009; Lin, Chen, Hsu, & Wag, 2012; Stoltzfus, Nibbelink, Vredenburg, & Thyrum, 2011). For example, Stoltzfus et al. (2011) examined the

relation between gender, and creativity in 136 undergraduate students and found that males fared better than females in originality of tasks involving listing unusual uses for a cardboard box and they also fared better across all creativity facets in a picture construction task. While in another study of gender differences in divergent thinking in 300 adults, Lin et al., (2012) found that women performed better than men on divergent thinking tasks. Finally, in a study of the gender difference in creativity scores on an electronic version of the Wallach–Kogan Creativity Tests in a sample of 2476 4th- to 9th-graders, Cheung and Lau (2010) found that girls performed better than boys in tests of verbal flexibility, and figural flexibility, fluency, and uniqueness and unusualness. The findings of our study add to this contradictory literature on gender differences in creativity. Here we can turn to Abraham (2015), who undertook an overview of the psychological and neuro-scientific literature on gender differences in creativity and (2015) concluded that it is naïve and unfounded to contend that one gender is more creative than the other, or even to say that there is utterly no difference between the sexes. Abraham (2015) contended that while there are no gender differences in terms of global or specific creative abilities, there are differences in cognitive strategies and styles that each gender is predisposed to implement.

C. Implications

Given the modest findings of this study, peer relations was the strongest predictor of creative thinking followed by academic achievement. Therefore, it is recommended that in schools school teachers and parents pay special attention to peer relations in creative students. Moreover, in the clinical field, it would be beneficial for clinicians to recognize problematic peer relations in creative students. It is also recommended that schools consider implementation of a

curriculum that fosters creativity in learning; such curriculum can increase the academic achievement of students. Finally, it might be beneficial to carry interventions with teachers, school principals and families of students to raise awareness regarding the benefits of fostering creative thinking in students and to understand students who have higher levels of creativity. Students who have higher levels of creativity might be viewed by their surroundings as troublemakers, aggressive or non-conforming, thus such interventions can alleviate this image and provide understanding for creativity in school and at home.

D. Limitations

This main limitation of this study was the sample size and sample characteristics in comparison to other articles. This study was based on a convenient sample of secondary classes' students and had a small sample size. Therefore, the results of this study could not be generalized to the student population in Lebanese Armenian schools in Lebanon. In addition, the study was implemented in 4 private schools only and data were not collected from public schools. As such, the results of the study could not be generalized to all schools in Lebanon. Therefore, the results of this study could only be generalized to Armenian private secondary schools.

E. Future Research

The findings of this study revealed that predictor variables; academic achievement, peer relations and facilitating anxiety were correlates of creative thinking. It could be also interesting to investigate the effect of other aspects of students' mental health such as depression, low self-esteem on creative thinking. It could also be interesting to explore the effect of other dynamics of students' social life such as bullying, popularity among peers, teacher-student relations on creative thinking.

It is recommended that future research would recruit wider population including students from elementary classes and students from public schools to explore creative thinking on a larger scale. Additionally, based on the high levels of missing values on academic achievement, it is recommended that in future research academic achievement scores would be directly obtained from school principals (after securing the consent of students) rather than self-reporting.

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Appendix A

Haigazian University

Social and Behavioral Sciences Department

Parental Permission Form

Permission for Child to Participate in Thesis Study

Thesis Title: The Relation between Creative Thinking, Academic Achievement, Anxiety and Peer Relations among Armenian secondary school students

Graduate Student: Mrs.LenaBaghdoyan

This is a permission form for your child for whom you are legal guardian to participate in a thesis study. It contains important information about this study and what to expect if you decide to permit your child, being his/her legal guardian, to participate.

Your child's participation is voluntary.

Kindly read the information below before you decide to allow your child to participate. If you decide to permit participation, you will be asked to sign this form and will receive a copy of the form. Your participation is highly appreciated.

Thesis study topic:

The aim of this research study is to explore creativity and its correlates, in a sample of students in secondary grade levels in Armenian schools in Lebanon. The correlates to be explored are academic achievement, anxiety and peer relations.

Procedures:

After your consent, your child will be provided with an assent form. If your child assent to participate in this study, he/she will be asked to fill in a survey consisting of a demographics form and three instruments; Alpert Haber Achievement Anxiety Test (AAT), Index of Peer Relations**,** Wallace and Kogan Creativity Test. The survey consists of 69 multiple choice and open-ended items in all. Survey administration will take 30-40 minutes from students during school day.

Risks and Benefits:

Participation of students in this thesis study is voluntary and will not involve any physical or emotional risk that surpasses risk possible in daily life. Participants have the right to withdraw their consent or discontinue participation at any time for any reason. Parents and children will receive no direct benefits from participating in this research. However, your consent is valuable as it will assist the researcher of the thesis study examine creativity and its relationship to academic achievement, anxiety and peer relations in secondary grade levels in Armenian schools in Lebanon.

Confidentiality:

Your child's name will remain anonymous as their names will not be requested. Information collected and related to the study will remain confidential.

Contact Information:

If you have any questions or concerns about the research, you may contact the graduate student Mrs. Lena Baghdoyan at 78-890726 or by email: lenabaghdoyan@gmail.com

Signing the Consent Form

I have read this form and I am aware that I am being asked to give permission for my minor child to participate in the thesis study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to give permission for my child/child under my guardianship to participate in this study.

Printed Name of the Child: _____

Printed Name of Person authorized to give permission for minor:

_____

Signature of person authorized to give permission for minor:

_____

Relationship to the Child: _____

Date: _____

Appendix B

Haigazian University

Social and Behavioral Sciences Department

Participant Assent Form

Thesis Title: The Relation between Creative Thinking, Academic Achievement, Anxiety and Peer Relations among Armenian secondary school students

Graduate Student: Mrs.LenaBaghdoyan

This is an assent form for you to participate in a thesis study. It contains important information about this study and what to expect if you decide to participate.

Your participation is voluntary.

Kindly read the information below before you decide to participate. If you decide to participate, you will be asked to sign this form and will receive a copy of the form. Your participation is highly appreciated.

Thesis study topic:

The aim of this research study is to explore creativity and its correlates, in a sample of students in secondary grade levels in Armenian schools in Lebanon. The correlates to be explored are academic achievement, anxiety and peer relations.

Procedures:

After your assent, you will be asked to fill in a survey consisting of a demographics form and three instruments; Alpert Haber Achievement Anxiety Test (AAT), Index of Peer Relations**,** Wallace and Kogan Creativity Test. The survey consists of 69 multiple choice and open-ended items in all. Survey administration will take 30-40 minutes from students during school day. You will also be asked to allow the principal investigator of this study to look at the final grades you received last year.

Risks and Benefits:

Your participation in this thesis study is voluntary and will not involve any physical or emotional risk that surpasses risk possible in daily life. You have the right to withdraw your assent or discontinue participation at any time for any reason. You will not receive any direct benefits from participating in this research. However, your assent is valuable as it will assist the researcher of the thesis study to examine creativity and its relationship to academic achievement, anxiety and peer relations in secondary grade levels in Armenian schools in Lebanon.

Confidentiality:

Your name will remain anonymous and will not be requested. Information collected and related to the study will remain confidential.

Contact Information:

If you have any questions or concerns about the research, you may contact the graduate student Mrs. Lena Baghdoyan at 78-890726 or by email: lenabaghdoyan@gmail.com

Signing the Assent Form

I have read this form and I am aware that I am being asked to participate in the thesis study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study.

Printed Name of the Participant: _____

Signature of the Participant:

_____

Date: _____

Appendix C

Demographics Questionnaire

1. Gender □ Male □ Female
2. Age: _____
3. Nationality: _____
4. Grade

□ Grade 10 □ Grade 11 □ Grade 12

Do you allow for the principal investigator of this study to look at the final grades you received last year?

□ Yes □ No

Appendix D

Instruments

Alpert Haber Achievement Anxiety Test (AAT)

Instructions

This questionnaire deals with your personal feelings, attitudes, and experiences about course examination. Some of the questions refer to your past experiences with examinations; when you answer these, think back to your school examinations of the last couple of years. Obviously there are no "right" or "wrong" answers to any of these kinds of questions. They merely offer an opportunity to express feelings and attitudes with regard to a large range of situations. The value of the results of this questionnaire will depend on how frank you are in stating your feelings and attitudes. Read each statement and set of alternatives carefully. For each of the 19 questions below, answer by circling the most appropriate statement. You can always go back to a question and change your response.

1. Nervousness while taking an exam or test hinders me from doing well.

A. Always
B. Often
C. Sometimes
D. Rarely
E. Never

2. I work most effectively under pressure, as when the task is very important.

A. Always
B. Usually
C. Sometimes
D. Hardly ever
E. Never

3. In a course where I have been doing poorly, my fear of a bad grade cuts down my efficiency.

A. Never
B. Hardly ever
C. Sometimes
D. Usually
E. Always

4. When I am poorly prepared for an exam or test, I get upset, and do less well than even my restricted knowledge should allow.

A. This never happens to me
B. This hardly ever happens to me
C. This sometimes happens to me
D. This often happens to me
E. This practically always happens to me

5. The more important the examination, the less well I seem to do.

A. Always
B. Usually
C. Sometimes
D. Hardly ever
E. Never

6. While I may (or may not) be nervous before taking an exam, once I start, I seem to forget to be nervous.

A. I always forget.
B. Usually
C. Sometimes
D. I often feel some nervousness
E. I am always nervous during an exam

7. During exams or tests, I block on questions to which I know the answers, even though I might remember them as soon as the exam is over.

A. This always happens to me.
B. This often happens to me.
C. This sometimes happens to me.
D. This hardly ever happens to me.
E. I never block on questions to which I know the answers.

8. Nervousness while taking a test helps me do better.

A. It never helps.
B. It usually doesn't help.
C. Now and then it helps.

D. It generally helps me a little.
E. It often helps.

9. When I start a test, nothing is able to distract me.

A. This is always true of me.
B. This is often true of me.
C. This is sometimes true of me.
D. This is hardly ever true of me.
E. This is never true of me.

10. In courses in which the total grade is based mainly on "one" exam, I seem to do better than other people.

A. Never.
B. Hardly ever.
C. Sometimes.
D. Quite often.
E. Almost always.

11. I find that my mind goes blank at the beginning of an exam, and it takes me a few minutes before I can function.

A. I almost always blank out at first.
B. I usually blank out at first.
C. I sometimes blank out at first.
D. I hardly ever blank out first.
E. I never blank out first.

12. I look forward to exams.

A. Never.
B. Hardly ever.
C. Sometimes.
D. Usually.
E. Always.

13. I am so tired from worrying about an exam, that I find I almost don't care how well I do by the time I start the test.

A. I never feel this way.
B. I hardly ever feel this way.
C. I sometimes feel this way.
D. I often feel this way.
E. I almost always feel this way.

14. Time pressure on an exam causes me to do worse than the rest of the group under similar conditions.

A. Time pressure always seems to make me do worse on an exam than others
B. Time pressure often seems to make me do worse on an exam than others.
C. Time pressure sometimes seems to make me do worse on an exam than others
D. Time pressure hardly ever seems to make me do worse on an exam than others.
E. Time pressure never seems to make me do worse on an exam than others.

15. Although "cramming" under pre examination tension is not effective for most people, I find that if the need arises,

A. I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use on the exam.
B. I am always able to use the "crammed" material successfully.
C. I am usually able to use the "crammed" material successfully.
D. I sometimes can use the "crammed" material successfully.
E. I hardly ever use the "crammed" material successfully
F. I am never able to use the "crammed" material successfully.

16. I enjoy taking a difficult exam more than an easy one.

A. Always
B. Often
C. Sometimes
D. Rarely
E. Never

17. I find myself reading exam questions without understanding them, and I must go back over them so that they will make sense.

A. Never
B. Rarely
C. Sometimes
D. Often
E. Almost always

18. The more important the exam or test, the better I seem to do.

A. This is true of me.
B. This is true of me much of the time.
C. This is sometimes true of me.
D. This is rarely true of me.
E. This is not true of me.

19. When I don't do well on difficult items at the beginning of an exam, it tends to upset me so that I block on even easy questions later on.

A. This never happens to me
B. This very rarely happens to me.
C. This sometimes happens to me.
D. This frequently happens to me.
E. This almost always happens to me.

Index of Peer Relations

This questionnaire is designed to measure the way you feel about the people you work, play, or associate with most of the time; your peer group. It is not a test, so there are no right or wrong answers. Place the name of your peer group at the top of the page in the space provided. Then answer each item as carefully and as accurately as you can by placing a number beside each one as follows:

1. Rarely or none of the time
2. A little of the time
3. Some of the time
4. A good part of the time
5. Most or all of the time

---

1. ___I get along very well with my peers.
2. ___My peers act like they don't care about me.
3. ___My Peers treat me badly
4. ___My peers really seem to respect me
5. ___I don’t feel like I am part of the group
6. ___My peers are a bunch of snobs
7. ___My peers understand me
8. ___My peers seem to like me very much
9. ___I really feel left out of my peer group
10. ___I hate my present peer group
11. ___My peers seem to like having me around
12. ___I really like my present peer group
13. ___I really feel like I am disliked by my peers.
14. ___I wish I had a different peer group
15. ___My peers are very nice to me
16. ___My peers seem to look up to me
17. ___My peers think I am important to them
18. ___My peers are a real source of pleasure to me
19. ___My peers don’t seem to even notice me
20. ___I wish I were not part of this peer group

21. ___My peers regard my ideas and opinions very quickly
22. ___I feel like I am an important member of my peer group
23. ___I can't stand to be around my peer group
24. ___My peers seem to look down on me
25. ___My peers really do not interest me

Wallace and Kogan Creativity Test as used by Roue (2011)

General Instructions

Think of this as a fun game. There are three sections to it, USES, SIMILARITIES, and INSTANCES. For each section there will be three challenges which you must address. There are no wrong answers, and you are not competing with each other.

Try to be as creative as you can when you answer. For each question, try to provide as many responses as you can.

Section A-USES

Instructions: In this section there are **three** items. For each one, think of as many **uses** as you can to which the given item can be put, no matter how far out your answer might be.

For each question, provide as many answers as you can on the sheet provided.

1. Indicate all of the ways in which you can use **a brick**

2. Indicate all of the ways in which you can use an **orange**

3. Indicate all of the ways in which a **lake** can be used

Section B—SIMILARITIES

Instructions: In this section, there are **three**items, each of which has two items that may be similar. For each item, list all of the ways you can think of in which the two items indicated are similar.

1. An apple and bar of chocolate

2. An elevator and a train

3. A pizza and the sun

Section C- INSTANCES

Instructions: In this section, there are **three**items. For each thing listed, you must indicate as many examples of it that you can think of.

1. Things that are fast

2. Things that provide energy

3. Things that rotate