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Full Length Research Paper

Career indecisiveness and personality in Greek High school students

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Career indecisiveness is one of the major career decision-making problems. Research so far has demonstrated its relation to a variety of personality factors. The present study aimed to explore, for the first time, indecisiveness in Greek junior High school students and its relation to personality parameters. Emotional and Personality-related Career decision-making Difficulties (EPCD) and Core self-evaluations scale (CSEs) for the assessment of both career indecisiveness and personality variables were administered to the students. The results showed that the students high in EPCD had not made any decisions concerning further education issues, such as type of senior high school, educational orientation, and future university studies. In contrary, the students of the sample who scored high in CSEs had made decisions on the above mentioned parameters. The results have been discussed in relation to implications for counseling.

Key words: Career indecisiveness, educational choice, personality, core self-evaluation, adolescents.

INTRODUCTION

Research in the career domain has paid attention to career decision-making problems in an attempt to help individuals to enhance their skills for career planning (Gati et al., 1996; Larson et al., 1988). One of the major career decision-making problems has been identified as indecisiveness (Salomone, 1982; Santos, 2001). Indecisiveness is conceptualized as a personality trait and a problem existing before the beginning of the career decision-making process, in contrary to career indecision which is defined as the difficulties that a person faces while making career-related decisions and it is considered to be a normal transitory phase during career decision-making process (Gati et al., 1996; Germeijs and De Boeck, 2002; Osipow, 1999). Indecisiveness seems to be stable enough and moreover to generalize across decision situations, since indecisive people have difficulties in making all sorts of life decisions, despite their degree of importance (Crites, 1969).

Clinical case studies (Salomone, 1982; Santos, 2001) have revealed that indecisive people seem unable to make decisions even when they have been involved in a long step by step decision-making process and suffer from personal problems such as anxiety, low self-confidence, dependency on others and an unclear sense of their self (Heppner and Hendricks, 1995). Moreover, indecisive people show a deviant decisional pattern in their career development, which is characterized by chronic anxiety and inadequate problem-solving skills (Savickas, 2004) and they are less committed to their educational and/or career choices (Germeijs et al., 2006). Those people need special attention during career counseling and problems related to indecisiveness should be early enough addressed and effectively treated, prior to any career counseling intervention concerning career decision-making in order for them to be fully involved in the career decision-making process, in a later stage, and

make more efficacious choices (Di Fabio, 2006; Germeijs and De Boeck, 2003; Nota and Soresi, 2004).

An adequate number of studies have examined the relationship between different aspects of personality and career indecisiveness. High level of anxiety, high levels of irrational beliefs, external locus of control, low self-esteem (Bacanli, 2006; Germeijs and Boeck, 2002; Germeijs et al., 2006; Salomone, 1982), and inadequate identity formation (Cellini and Kantrowski, 1984; Fuqua et al., 1987; Johnson, 1990; Salomone, 1982) are among the most prevalent personality factors that have been found to be related to career indecisiveness and general or chronic indecisiveness.

The researchers, taking into consideration the distinction between career indecision and career indecisiveness and the importance of the latter in the context of career counseling and guidance, developed scales that measure indecisiveness. More precisely, Frost and Shows (1993) developed the Frost Indecisiveness scale, which is a 15-item self-report scale. The scoring is based on two subscales labeled fears about decision making and positive decision making. Another researcher, Bacanli (2000) developed the Personal Indecisiveness Scale (PIS) which is also subdivided into two subscales: exploratory indecisiveness which refers to difficulties related to a long decision-making process and impetuous indecisiveness which refers to quick decision making and giving up such decisions easily. Two years later, Germeijs and de Boeck (2002) published another scale measuring indecisiveness and verified the fact that the two terms (career indecision and indecisiveness) are two separate constructs, since self-esteem as a personality aspect was found to be related only to career indecisiveness.

The model of Emotional and Personality-related Career Decision-making Difficulties (EPCD)

Saka et al. (2008), acknowledging the career indecisiveness as a major problem for people that affects several aspects of their lives, provided the career literature with a general conceptual framework for emotional and personality-related career decision-making difficulties, which addresses in a concrete way the factors that previous research has highlighted as being associated with indecisiveness. The framework is organized into three factors: pessimistic views, anxiety, and self-concept and identity. After analysis, factors are subdivided in 11 categories.

Pessimistic views. Saka et al. (2008) taking into consideration the research related to pessimism and emotional and behavioral reactions have defined pessimistic views as negative cognitive biases and perceptions. These perceptions include pessimistic views regarding the world of work, pessimistic views about the process, and the individual's degree of control over the process and outcomes. Pessimistic views regarding the world of work refer to negative perceptions of

occupations. Pessimistic views about the process refer to a person's low career-decision making self-efficacy, since the person considers himself as incapable of carrying out an appropriate career decision-making process. The third category, pessimistic views about one's control, refers to a person's sense of an external locus of control in the process, the choice and/or the outcomes.

Anxiety. Anxiety refers to the effects of anxiety of specific aspects of the decision making process and it consists of four categories: A) Anxiety about the process, which refers to "...feelings of stress and anxiety prior to the decision making process or anxiety evoked by perfectionism about the process" (p.406). B) Anxiety related to the uncertainty involved in choosing, which refers to uncertainty about the future, anxiety about being in an undecided state, and anxiety related to low tolerance for ambiguity. C) Anxiety about the process of choosing included perfectionism about choosing, fear of losing other potentially suitable options, fear of choosing an unsuitable occupation and anxiety about one's responsibility for the act of choosing. D) Anxiety about the outcome "refers to worries about the implications of the actualization of the chosen alternative" (p. 407), which is the fear of failure of not meeting one's expectations and preferences in the certain occupation.

Self-concept and Identity: Self-concept and Identity is the last factor of the model. It refers to one's developmental personality aspects and consists of four categories: A) Self-esteem which is defined as a sense of a person's self-worth in both general and career related aspects of life. B) General anxiety which refers to the general trait of anxiety as a more broader and stable personality trait and less as an emotion. C) Uncrystallized identity which refers to difficulties in forming a stable sense of personal identity resulting to a person's difficulties in expressing "...consolidated beliefs, values, preferences, and life goals" (p.408) and preventing "...the individual from expressing clear vocational preferences, interests, aspirations, and career goals" (p. 408). D) Conflictual attachment and separation, which refers, on one hand, to difficulties in relations with significant others and more specifically to difficulties concerning excessive criticism, lack of satisfaction, lack of support from intimate others, and on the other hand, to a person's need for approval from them. Both sources are considered to affect a person's career decision-making process and/or choice.

Based on the above mentioned model, Saka et al. (2008) developed a scale named Emotional and Personality-related Career decision-making Difficulties (EPCD) which measures indecisiveness. The original version of the scale consists of 53 items, while the short version developed by Gati et al. (2011) consists of 25 items. Both versions have been used in studies based on Israeli and American sample (Gati et al., 2011), while the

original version has been validated for Portuguese (da Silva and Ventura, 2012) and Turkish population (Oztemel, 2012).

Core self-evaluation

Core self-evaluation is a construct within the personality domain which mainly refers to a positive self-concept (Judge et al., 1997). CSE theory has been derived from Packer's writings, a Clinical Psychologist and a Philosopher as well, who suggested that individuals make general evaluations of themselves, that have a sub-consciously impact on their appraisal of the world around them. Packer (1985) noted that core evaluations are "basic conclusions, bottom-line evaluations, that we all hold subconsciously" (p. 3). Judge et al. (1997) extended Parker's idea and developed an integrative theoretical framework in order to explain dispositional impacts on job satisfaction.

CSE is defined as "fundamental premises that individuals hold about themselves and their functioning in the world" (Judge et al., 1997, p. 161). The specific personality construct consists of four specific traits: (a) self-esteem (i.e., the basic appraisal of a person's worth), (b) generalized self-efficacy (i.e., a person's global perception of his or her ability to successfully complete a set of behaviors), (c) locus of control (i.e., the degree to which a person believes that he or she controls events in life, rather than the environment, powerful others or fate), and (d) emotional stability and it sometimes known by its converse, neuroticism (i.e., a person's lack of emotional stability and his or her tendency to dwell on the negative) (Judge and Bono, 2001a). Although these traits are not identical, they do share significant conceptual similarities, and it is this area of similarity that constitutes the basic, fundamental assessment an individual makes of oneself. The developers of the construct argue that this broad personality construct is dispositional in nature, predicts action over time and over situations, and thus offers more information about behavior than single constructs (Judge et al., 2003). More precisely, the authors argued that, ". . . core-self evaluations is a basic, fundamental appraisal of one's worthiness, effectiveness, and capability as a person" (Judge et al., 2003, p. 304). Furthermore, Judge et al. (2004) noted that "individuals with positive core self-evaluations appraise themselves in a consistently positive manner across situations; such individuals see themselves as capable, worthy, and in control of their lives" (p. 328–329). Validation studies conducted by CSE's developers found that the specific construct was distinct from other personality traits and the predicted outcomes were above and beyond other personality traits (Judge et al., 2003). CSE has been found to be related to various aspects of human life and functioning, such as expression of emotions (Judge et al., 1999), life happiness (Piccolo et al., 2005), life satisfaction (Chang

et al., 2012; Judge et al., 1998), gerontology (Baker et al., 2011), nursing (Almost et al., 2010), and physical and psychological health functioning (Tsaousis et al., 2007).

CSE has been widely used in the organizational domain and has shown unique relationships to outcomes above and beyond other individual predictors (Chen, 2012). The construct has been reported to have a positive relation to job satisfaction (Chang et al., 2012; Dormann et al., 2006; Judge and Bono, 2001; Judge et al., 2003), engagement (Rich et al., 2010), popularity (Scott and Judge, 2009), and a negative effect on work burnout (Best et al., 2005). However, it is worth mentioning that a recent research on the bottom line of organizational psychology and career guidance found no relationship between CSE and the calling in career which refers to the one's perception that a certain career is the purpose of his life (Hirschi, 2011). In Greece, CSE has been recently studied in relation to career decision-making difficulties (Koumoundourou et al., 2011) and career decision-making self-efficacy (Koumoundourou et al., 2012). The results of the first mentioned study showed that the CSE fully mediated the relationship between family variables and girls' career decision-making difficulties. The results of the other study showed that CSE as a personality construct had a direct and indirect effect on vocational identity via career decision-making self-efficacy for girls. As Chen (2012) noted, the research related to organizational domain has clearly demonstrated the CSE's usefulness, but more research is needed in order to understand how CSE contributes to the research literature related to other scientific fields.

The present study

The Greek educational system demands from adolescents (14-15 years old) to make decisions concerning their future career planning early enough in their lives. Their first choice concerns whether they are going to leave school early –at the end of junior High school- or they are going to continue their secondary education studies by choosing one of the two types of senior High school (General or Technical High school). Greek research has tried, so far, to identify the factors that influence the students' specific career decision-making. The literature has stated that the individual's micro-social environment factors, such as family (Kounenou, 2011), gender, values and social class affect Greek adolescents' career choice (Kassimati, 1991). In Greek society, parental influence on young people's career choice seems to be rather important and prominent due to parents' active involvement into their children's lives. Greek parents' habit of organizing their children's lives affects directly and indirectly the latter's life choices (Kassimati, 1991; Kokkotas, 1978). For example, Saiti and Mitrosilli (2005) reported that Greek parents strongly advise their children to follow upper secondary education

that leads to higher education, instead of attending other types of post secondary education. Although most of the research in adolescents' career decision-making is based on general high school students, Greek students in technical secondary education seem to have different characteristics from students in general education. For example, research (Christopoulou, 2010; Katsampouri et al., 2009) has shown that more males and more immigrants attend technical high schools than general ones. The majority of those students either view their choice as a realistic one providing them with more career options or they consider the studies in a general high school as more demanding. Technical high school students are more influenced by their fathers' occupational status and show less preference to enrolling in universities than students of general secondary education (Christopoulou, 2010). Despite the fact that Greek research (Koumoundourou et al., 2011; Kounenou, 2011) in the field of adolescents' career decision-making difficulties has been increased, little attention has been paid to career indecision (Argyropoulou et al., 2007) and more-over to career indecisiveness, which remains an un-explored field for the Greek population. It would be rather important to explore whether career indecisiveness in Greek High school students is related to their first career choice in regard to their secondary education studies and whether personality factors are related to the specific decision.

METHODS

Due to the need for the exploration of the indecisiveness in Greek population and responding to the call of the developers of EPCD for studies that could focus on validating EPCD with additional instruments that measure personality characteristics and indecision (Saka et al., 2008), the present study aimed at exploring issues of career indecisiveness in Greek High school students in relation to their personality aspects, based on EPCD model. Greek adolescents, early enough (15-16 years old), have to make educational and career decisions concerning the type of high school that they are going to attend for the next three years: general lyceum, or technical/vocational technical high school. For the majority of the Greek adolescents, the specific choice is related to their future graduate studies in a University or Technical Institution level and therefore determines their future occupation as well. Besides, as other studies have demonstrated (Creed et al., 2006; Saka and Gati, 2007) and as Hirschi et al. (2011) have stated "...early measures of career development status, therefore, provide important signals regarding those students who may be at risk for or experience extended career indecision" (p. 179).

Based on previous studies (Gati et al., 2011; Saka et al., 2008) that have demonstrated that emotional and personality related factors are associated with career indecisiveness, it is hypothesized in this study that: a) the correlation between the total scores of the EPCD and the measure of the Greek students' absence of decision concerning the type of senior High school, the kind of scientific direction and their future university studies will be positive and relatively high, b) the correlations between EPCD clusters and subscales and the measure of the Greek students' absence of decision concerning the type of senior High school, and their future university studies will be positive and relatively high.

Additionally, based on the studies of Chang et al. (2012) and Chen (2012) showing that Core self-evaluations are related to various aspects of one's behavior, especially in the organizational domain, it is hypothesized that the correlations between CSEs and the measure of students' absence of decision concerning the type of school and the kind of scientific direction will be negative and relatively high. Finally, based on the studies of Chang et al. (2012) showing that Core self-evaluations are negatively related to people's negative affectivity, and that EPCD is negatively correlated to positive affection and positive aspect of personality (da Silva and Bentura, 2012), it is hypothesized that EPCD measures and measures of CSEs will be negatively correlated to each other.

Sample

The sample consisted of 200 Greek junior high school students studying in four high schools in the city of Athens. Each school belongs to a different region of the capital. Although authorization was taken from the administrations of several high schools, only the students of the schools that authorization was approved during the data collection participated in the study. Fifty students from each school (each group of students in a regular public school consists of 25 students), all in the final year of junior high school, filled out the questionnaires. In all, 41.5% were boys and 58.5% were girls and their age was 15 years old.

Instruments

Questionnaire for demographic variables. A questionnaire was made for the purposes of the study consisting of 15 items. Participants were asked to declare their parents' educational background and career status, their status of decisions concerning type of senior high school (General, Technological, no decision), kind of educational orientation (scientific, technological, theoretical, no decision) and whether they have made their decisions concerning their future university studies.

Emotional and Personality Career Difficulties Scale (EPCD; Gati et al., 2011), short version. The EPCD was used in order to assess participants' indecisiveness and the personality factors related to it. The short version consists of 25 items. The first page of the questionnaire includes general background information (gender, age, and years of education). The following pages contain 25 statements, each representing one of the eleven difficulty categories. The participants were asked to rate the degree to which each statement described them on a 9-point scale (1- *does not describe me* to 9- *describes me well*). Cronbach-alpha's internal consistency reliabilities in the sample of the present study were: .92, .79, .92, .76 for the total scale, and the three major clusters (pessimistic views, anxiety, and self concept and identity) respectively. The reliabilities for the 10 scales ranged from .57 (for the pessimistic views about the world work) to .86 (for anxiety about the choice). The relatively low reliability for the pessimistic views is in line with previous research concerning low reliability for the total of Pessimistic views cluster (Gati et al., 2011; Gati et al., 2011; Saka and Gati, 2007; Saka et al., 2008). The relatively low reliability for the self-concept and identity could be attributed to the sample's age, since young adolescents have not achieved a concrete identity and especially the Greek ones' career decisions are susceptible to the parental impact. Unlike the aforementioned studies having used the specific scale, the reliability for the identity attachment subscale was found to be .20 and therefore the specific subscale was excluded from the further analysis of the results. EPCD was translated into Greek language following the translation-back translation procedure. More precisely, the English short version of

the EPCD scale was translated into Greek by a native English person who was born in Greece and by a Professor of career counseling who speaks English fluently due to her studies in Great Britain. The two separate translations were compared to each other and the Greek form was generated. Finally, the Greek form was translated back to English by an instructor in English language.

Core Self-evaluations Scale (CSE; Judge et al., 2003). The CSE is a 12-item questionnaire assessing the construct of CSE. More specifically, CSE consists of statements assessing (a) self-esteem, (b) generalized self-efficacy, (c) locus of control, and (d) neuroticism, but it provides one general score rather than treat each of the assessed variables as independent subscales. CSE has been reported by its developers (Judge et al., 2003) to have adequate internal consistency (average reliability was .84 across four different samples) and test-retest reliability (.81 over a month period). The CSE uses a 5-point response scale for the degree to which each statement is representative (or not) to the person responding (1- *not representative at all* to 5- *very representative*). Scores ranged between 12 and 60. Example items include, "I complete tasks successfully," "Overall, I am satisfied with myself," and "Sometimes I feel depressed." The alpha coefficient for CSE total score for the present study was .88. CSE was translated into Greek by Tsaousis et al. (2007) following the translation-back translation procedure (Brislin, 1970). CSE has been previously used in Greek career-related studies (Koumoundourou et al., 2011, 2012).

Procedure

The study was survey based. Participants were asked to participate in the research aiming to examine the procedure, by which career decisions are made. Trained investigators visited students at their classrooms and after informing them about confidentiality issues and that they had the right to withdraw from the administration at any time and any stage, they administered a booklet containing the above instruments in different order to control for order effect. No name or identification number was required, thereby maintaining anonymity. The questionnaire booklet took approximately 25 min to complete.

Statistical analysis

The analysis of the data was performed with statistical methods of descriptive and inferential statistics. For the statistical analysis, the statistical package SPSS (version 13) was used. T-test was used to compare the mean scores of the continuous variables among two groups (categorical variables), whereas one-way analysis of variance (ANOVA) was used when the groups were more than two. Pearson correlation was used in order to explore the relationships among continuous variables.

RESULTS

Preliminary analyses based on sample's demographic characteristics

The majority of the students (80.9%) live with both parents, while 19.1% of them come from separated or divorced families. Regarding the parents' working status, the results showed that 80.5% of the fathers and 48.5% of the mothers are employed, 8.5% of the fathers and 11% of the mothers are unemployed, 6.5% of the fathers

and 1.5% of the mothers have been retired and 38.5% of the mothers are housewives. Regarding the students' decisions on the senior high school, 46.7% have decided to attend general lyceum, 24.1% have decided to attend the technical one, 19.6% have not made any decision and 9.5% of them have decided to drop-out. Regarding the students' decision on the educational orientation, 31.2% of them have chosen the scientific orientation, 23.4% of them have chosen the theoretical orientation, 16.2% have chosen the technological one and 29.2% have not made any specific decisions.

There were no statistical significant differences on the demographic variables, such as gender, siblings, school, profession of mother and father. The main differences were found among father's ($\chi^2 = 27.258$, $df=6$, $p>0,001$) and mother's educational background ($\chi^2 = 17.740$, $df=5$, $p>0,005$), father's ($\chi^2 = 11.465$, $df=2$, $p>0,005$) and mother's ($\chi^2 = 23.812$, $df=3$, $p>0,001$) working status (employed, unemployed, and retired). Specifically, the students whose father and mother were secondary education graduates and higher education graduates tended to be more decisive on their future plans. Regarding the parental working status, it seems that the students who had made their decisions were those whose parents were employed, whereas those whose parents had been retired had not made any decisions.

EPCD and the students' decisions on school, educational orientation, and future studies

Anova was used to test the relationship between EPCD total score and the students' decision concerning the type of senior high school. A significant difference [$F= 4.376$ (3,179) $p=0.005$] was found referring to the EPCD scores between students who have made their decisions concerning general lyceum and those who have not made any specific decisions (Table 1).

The relationship between the subscales of EPCD and the students' decision on the type of school was tested by Anova. Significant differences were found in pessimistic views [$F= 7.976$ (3,179) $p=0.000$], pessimistic views about the process [$F= 8.845$ (3,179) $p=0.000$], pessimistic views about the world of work [$F= 8.845$ (3,179) $p=0.000$], pessimistic views about the individual's control [$F= 8.847$ (3,179) $p=0.000$], anxiety about the process [$F= 4.205$ (3,179) $p<0.01$], anxiety due to the uncertainty involved in choosing [$F= 3.062$ (3,179) $p<0.05$], self-concept and identity [$F= 6.248$ (3,179) $p=0.000$] and identity uncrystallized [$F= 12.601$ (3,179) $p=0.000$], between the students who have chosen to continue their high school studies in a general lyceum and those who do not know what they are going to do next year.

Anova was also used to test the relationship between EPCD total score and the sample's decision on the educational orientation. Referring to the EPCD scale, there was found a significant difference [$F= 6.847$ (3,141)

Table 1. Mean, standard deviation, and significance between EPCD and decision on the type of senior High school.

Type of High school	EPCD		F	df	Sig
	M	SD			
General	119.28	40.87	4.376	3.179	.005
Technological	128.93	33.16			
Drop-out	129.50	40.73			
No decision	145.46	24.85			

** Correlation is significant at the 0.05 level.

Table 2. Mean, standard deviation and significance between EPCD total and students' decision on future educational orientation.

Educational orientation	EPCD		F	df	Sig
	M	SD			
Science	114.40	42.86	6.847	3.141	.000
Theoretical	114.00	40.02			
Technological	132.67	33.61			
No decision/Don't know	145.65	26.31			

** Correlation is significant at the 0.01 level.

$p < 0.001$] between students who have made their decisions concerning either theoretical or scientific orientation and those who have not made any decision (Table 2).

The assessment of the relationship between EPCD scales and subscales and the sample's decision on the scientific orientation revealed significant differences in *pessimistic views* [$F=10.155$ (3,141) $p=.000$], *pessimistic views about the world of work* [$F=9.146$ (3, 141) $p=.000$], *pessimistic views about the process* [$F=9.146$ (3,141) $p=.000$], *pessimistic views about individual's control* [$F=8.957$ (3,141) $p=.000$], *anxiety* [$F=4.691$ (3,141) $p < 0.005$], *anxiety about the choice* [$F=5.579$ (3,141) $p=0.001$], *anxiety about the process* [$F=6.996$ (3,141) $p=.000$], *anxiety due to uncertainty involved in choosing* [$F=6.623$ (3, 141) $p=.000$], *self-concept and identity* [$F=5.638$ (3,141) $p=.001$], and *identity uncrystallised* [$F=18.228$ (3,141) $p=.000$].

The assessment of the relationship between EPCD total and its subscales and the students' decision status on their future university studies revealed significant differences between the students who have made their decisions and those who have not (they do not know what they would like to study) on the following scales: EPCD total [$t(181) = 4.269$ $p=.000$], *pessimistic views* [$t(186) = 4.174$ $p=.000$] *pessimistic views about the process* [$t(191) = 4.004$ $p=.000$], *pessimistic views about the world of work* [$t(191) = 4.004$ $p=.000$], *pessimistic views about individual's control* [$t(188) = 4.904$ $p=.000$], *anxiety* [$t(185) = 3.109$ $p=.000$], *anxiety about the process*

[$t(190) = 4.225$ $p=.000$], *anxiety due to uncertainty involved in choosing* [$t(188) = 3.602$ $p=.000$], *anxiety about the choice* [$t(187) = 4.342$ $p=.000$], *self-concept and identity* [$t(187) = 4.462$ $p=.000$] and *uncrystallised identity* [$t(189) = 9.356$ $p=.000$].

CSEs and students' decision on school, educational orientation, and future studies

The analysis of the data concerning the relationship between CSEs and the sample's decision on type of school revealed a significant difference between the students that they will drop-out and those who have decided on continuing their studies in a General Lyceum [$F=6.512$ (2,193), $p=.000$]. A significant correlation [$F=3.298$ (3,149), $p < .005$] was also found between the students who have chosen scientific orientation and those who have not made their decisions. Additionally, students who have made already their decisions on their future studies scored higher on CSEs [$F=.8851$ (3,104) $p=.005$].

EPCD and CSEs correlation

Table 3 shows the means, standard deviations, and the correlations of the total EPCD and its three major clusters with CSEs. As can be seen, all Pearson's correlations are negative and high. More precisely, CSEs is negatively

Table 3. Means, standard deviations, and correlations between students' scores on EPCD and CSEs.

Scales	M	SD	N	CSES
Total	127.50	37.36	184	-.479**
Pessimistic views	30.93	10.98	190	-.436*
Anxiety	40.54	17.27	188	-.342**
Self-concept and Identity	39.02	11.99	191	-.487**
M	-	-	-	40.15
SD	-	-	-	7.50

**Correlation is significant at the 0.01 level.

related to EPCD total (-.479, $p < .01$), pessimistic views (-.436, $p < .01$), anxiety (-.342, $p < .01$), and self-concept and identity (-.487, $p < .01$).

DISCUSSION

The present study aimed at exploring career indecisiveness in Greek senior High school students regarding their first career choice and its relation to personality factors.

The results showed that the students who had not made decisions concerning the type of senior high school, the educational orientation, and their future university studies appeared to have higher total EPCD scores than those who had made their decisions. According to these results, EPCD seems to be highly correlated to the students' difficulty to decide on the specific parameters. In EPCD clusters and subscales, the results showed that the students of the sample who had not made their decisions about the type of school appeared to have higher scores on all the subscales of the pessimistic views cluster, anxiety about the process, anxiety due to uncertainty, self-concept and identity, and identity uncrystallized. Similar results were revealed in the students who had not made their decisions on their educational orientation and their future university studies. These results seem to be in line with the findings observed in other research studies showing that indecisive persons present to have high anxiety, low self-efficacy (Multon et al., 1995), while career indecisive persons are characterized by high level of anxiety or neuroticism, low career related self-efficacy (Saka and Gati, 2007; Gati et al., 2011), external locus of control (Saka and Gati, 2007; Santos and Ferreira, 2011; Gati et al., 2011) low self-esteem, and inadequate identity formation (Bacanli, 2006; Cellini and Kantrowski, 1984; Chantand et al., 1993; Gati et al., 2011; Johnson, 1990).

On the contrary, the students of the present study who had chosen to continue their studies in a General Lyceum, had chosen the scientific field as an option of their future educational orientation and who had made their decisions on their university studies appeared to have higher scores on CSEs. Literature has previously shown that

high-CSE individuals seem to adopt approach goals (Judge et al., 2005), are more motivated and committed to pursuing opportunities (Judge and Hurst, 2008) while low-CSE ones seem to avoid any threats and risks (Srivastava et al., 2010). A meta-analysis conducted by Chang et al. (2012) showed that high-CSE individuals tend to set more challenging goals, be more committed and persistent, while persons who express more comfort in their career decision-making ability exhibit positive affections and are adequately confident (Multon et al., 1995).

In accordance to the present research's hypothesis, the negative correlations between CSEs and the total EPCD and the three cluster scores were relatively high. The results showed that the students of the sample with a positive self-concept present to have lower scores in EPCD and vice versa. This finding shows that emotional and personality-related aspects of career decision-making difficulties are lower when self-esteem, generalized self-efficacy, and internal locus of control are higher, while neuroticism is lower. These negative correlations provide evidence for the validation of the EPCD short version scale for the Greek young adolescents, since CSE as a personality instrument measures the same basic parameters as EPCD does. Da Silva and Ventura (2012) tested the EPCD's validity in relation to other instruments assessing positive affectivity and positive personality factors (e.g. self-esteem). The results of their study showed strong negative relationships between EPCD clusters and total score and the positive aspects of affections and personality. Other researchers (Chang et al., 2012; Elliot and Thrash, 2002) have also demonstrated that CSE has strong negative relations with negative affectivity and markers of avoidance temperament, such as avoidance motivation and performance avoidance goal orientation.

Summarizing the aforementioned results concerning the relationship of the two instruments with the sample's career decision, it could be stated that, there are certain personality characteristics (locus of control, self-esteem, self-efficacy, anxiety, and degree of identity formation) that are related to the Greek young people's career decision-making ability concerning their studies in upper

secondary education. Taking into account previous Greek research results showing that the most prevalent factors influencing Greek young adolescents' career decision-making behavior are the parental and family ones, the present study has shown that both positive and negative aspects of the personality could be considered as factors that should be taken into consideration by researchers and counselors, as far as career decision-making ability and/or career indecisiveness is concerned.

Limitations

It is nevertheless necessary to note some research limitations. First, the data were collected from the capital of Greece, excluding more rural and suburban areas. Therefore, the results need to be cautiously applied elsewhere. Additionally, as evident to most other studies in this area, the findings are based only on self-report data and therefore the validity of the correlations found is limited. Finally, given that the assessment of constructs was concurrent, the issue of causation remains unresolved and needs to be addressed by longitudinal designs.

Implications for counseling

The knowledge concerning personality variables that are related to students' career decision-making ability allow counselors to individualize the intervention programs according to the young people's needs (Salomone, 1982; Savickas and Jarjoura, 1991). As far as indecisive persons are concerned, the counselors need to address and help the individuals to resolve more central personality issues, such as pessimism, anxiety, and identity formation before they start dealing with career decision-making difficulties. EPCD seems to be a useful instrument for the assessment of the Greek young students' indecisiveness and the personality variables that influence it, while CSE seems to provide counselors with enough evidence concerning the positive aspects of personality that should be enhanced. Therefore, the early identification of the personality factors that are related to Greek young adolescents' career decision-making ability can enhance career counseling process's beneficial outcome and help the persons to cope with the obstacles caused or maintained by their personality that leads to problems concerning career and life planning.

Conclusion

The present study tried to explore EPCD parameters and Core self-evaluations of Greek junior high school students in relation to their decisions on type of senior High school, educational orientation, and future university studies. Students who have not made any decisions

regarding the above mentioned parameters scored higher in EPCD scales, while the students who had made their decisions had more positive self-concept as it was measured by CSE.

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Full Length Research Paper

Mathematics anxiety among engineering students and its relationship with achievement in calculus

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This paper analyzed the relationship between Mathematics Anxiety and Calculus Achievement among engineering students. The sample consists of 148 (116 males and 32 females) year one students of Waziri Umaru Federal Polytechnic, Birnin, Kebbi. Pearson correlation, paired samples t-test and Independent sample t-test were used to analyze data using SPSS version 20.0. The results obtained showed that Mathematics anxiety has insignificant negative correlation with Calculus achievement. It was also gathered that gender difference in Mathematics anxiety is significant while gender difference in Calculus achievement is not significant. Females exhibit high anxiety than males.

Key words: Mathematics anxiety, calculus, Mathematics performance, achievement.

INTRODUCTION

Richardson and Suinn (1972) defined Mathematics anxiety in terms of its (debilitating) effects on Mathematics performance. They observed that the feeling of tension and anxiety interferes with manipulation and solving of Mathematical problems in a wide variety of ordinary life and academic situations. Mathematics anxiety affects students' confidence in Mathematics. Many students who suffer from Mathematics anxiety have little confidence in their ability to do Mathematics and tend to take the minimum number of required Mathematics courses, greatly limiting their career choice options (Garry, 2005). Mathematics anxiety involves a feeling of tension and apprehension about performing Mathematics and is associated with delayed acquisition of core Mathematics and number concepts and poor Mathematics competence. It can be viewed as a situation of discomfort observed during working on Mathematical problems (Hadfield and Trujillo, 1999). Tobias and Weisbrod (1980) described Mathematics anxiety as the "the panic, helplessness, paralysis and mental disorganization that arises among some people when they are required to solve a Mathematical problem. Smith (1997) listed a varied characteristics of Mathematics anxiety that include uneasiness when asked to perform mathematically,

avoidance of Mathematics classes, feeling of physical illness, faintness, dread or panic, inability to perform on a test and utilization of tutoring sessions that provide very little success. Anxiety situation is associated with fear and apprehension to specific Mathematics related situations such as applied Calculus (D'Ailley and Bergering, 1992).

Baloglu and Kocak (2006) outlined three major factors that cause Mathematics anxiety, namely, Dispositional, situational and environmental factors. The dispositional factors are concerned with psychological and emotional features such as; attitudes towards Mathematics, self-concept and learning styles. The self concept refers to students' perception of their own ability to perform well in Mathematics and to learn new topics. The situational factors are direct features that result from their particular Mathematics courses, the nature of the course, and how it is designed and carried out, pace of instruction, etc. The environmental factors are characteristics that affect the students prior to their Mathematics course; for instance, age, gender, academic major, and previous Mathematics experience.

Socio economic background may interfere with the level of Mathematics anxiety of the students at various

levels.

Parents' educational level, income, age, and the school type are good predictors of Mathematics anxiety (Mahigir et al., 2012).

Mathematics anxiety may be as a result of past experience by the learner. Freedman (2003) defined Mathematics anxiety as "an emotional reaction to Mathematics based on a past unpleasant experience which harms future learning". Mathematics anxiety is an outcome of low self esteem and fear of failure. It causes problems for processing the next oncoming information as well as in using previously learned information for problem solving. Such students tend to avoid Mathematics whenever or wherever possible (Daane et al., 1986). Mathematics anxiety is found to affect teaching and learning (Wigfield and Meece, 1988). Students that are bored and apprehensive towards Mathematics may tend to avoid Calculus. This is due to adverse emotional reaction of the students towards the subject (Henbree, 1990). Mathematics anxiety is often viewed from a deficit perspective through which it explains a lack of demonstrable mathematical ability. For instance, it is defined as a restrictive influence on successful working with numbers and problem solving (Furner and Berman, 2003).

Mathematics anxiety was found to affect the academic achievement in Mathematics of the students. According to Karimi and Venkatesan, (2009), there is a relationship between Mathematics anxiety, mathematics performance and academic hardness in high school students. Their findings revealed that Mathematics anxiety has significant negative correlation with Mathematics performance. They also reported a significant gender difference in Mathematics anxiety. They also reported no significant difference between boys and girls in Mathematics performance. They also suggest that the performance of students in Mathematics can be influenced by Mathematics anxiety. Correlation between Mathematics anxiety and Mathematics performance is a construct that attracts comments and researches. According to Pourmasleme et al. (2013), a significant correlation was observed between high level anxiety and low academic performance. Significant difference between males and females in Mathematics anxiety was also reported.

Gender difference is a phenomenon that continues to attract attention in almost all fields that affect our daily lives. In engineering, there is a wide gap in participation between males and females. There is a mark difference between males and females who obtained degrees or higher national diploma in engineering and technology in Nigerian institutions (Badekale, 2003). Research has indicated a significant difference in Mathematics anxiety between males and females. In other words, females exhibit higher Mathematics anxiety than males (Pourmoslemi et al., 2013). However, Achor et al. (2010) found no significant difference in achievement and interest in geometry between males and females. This may be a pointer that gender difference mentioned above may not be related to

Mathematics in Engineering. A similar research by Moses and Daniel (2008) found a disappearing gap between males and females in Integrated Science.

Background of the study

Calculus is imperative to science, engineering and technology. Applications of calculus in engineering problems are diverse; therefore students of engineering are expected to study it rigorously for effective application. Examination results have shown that students of engineering at Waziri Umaru Federal Polytechnic exhibit some weakness in calculus during semester examinations of 2010/2011 and 2011/2012 sessions with mean score of 51.23 and 47.52% respectively. This study seeks to examine the relationship between Mathematics anxiety and students' achievement in Calculus. Gender stereotype in calculus will also be examined.

Research hypotheses

Three hypotheses are to be tested in this study, namely;

- i. There is relationship between Mathematics anxiety and calculus achievement.
- ii. There is significant difference between males and females in Mathematics anxiety.
- iii. There is significant difference in calculus performance between males and females.

METHODOLOGY

The population of this study is the entire year one (i.e., ND 1) students of College of Engineering of the Waziri Umaru Federal Polytechnic, Birnin Kebbi (n < 400). A sample of one hundred and forty eight (148) students was randomly selected using simple random sampling. The sample comprised 32 or 21.62% females and 116 or 78.38% males. The instruments used for data collection are Mathematics Anxiety Scale (MAS) and Calculus Achievement Test (CAT). The MAS is an abbreviated Mathematics anxiety instrument that has 14 items designed to measure the Mathematics anxiety of college students (Mahmood and Khatoon, 2011). The MAS is a two dimensional and short instrument where seven items were worded positively and seven items, worded negatively. Mathematics anxiety score is calculated by adding the individual scores of all the items together whose possible range is between 14 – 70. High score on the MAS indicates a high level of mathematics anxiety; that is the reason the score is reversed. The instrument uses a 5 point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree) for positive items and 5 (strongly agree) to 1 (strongly disagree) for negative items. The MAS has split half reliability of 0.89 and Cronbach's alpha 0.87. CAT is a 10 questions essay type test; the items on this instrument are based on three cognitive levels of knowledge, understanding and application. The test items are scored manually, each question answered correctly attracts a total score of 10 marks. Thus the highest mark obtainable is 100 and least mark obtainable is zero. The level of performance of a student is taken as student's total test score.

RESULTS

The analysis of data was carried out using SPSS version 20. Three factors were analyzed;

Gender difference in Mathematics anxiety, Calculus Achievement and relationship between Mathematics anxiety and Calculus achievement.

i. *Gender Difference in Mathematics anxiety.*

An independent samples t-test was conducted to examine whether there was a significant difference in Mathematics anxiety between males and females. The test revealed a statistically significant difference between males and females ($t = -3.979$, $df = 146$, $p < 0.01$). Females (Mean = 45.28, SD = 9.77) reported significantly higher level of anxiety than males (mean 37.12, SD = 10.40).

ii. *Gender Difference in Calculus Performance.*

Also, an independent samples t-test was carried out to examine if there was a significant difference in Calculus performance between males and females. The test results revealed a statistically insignificant difference in calculus performance between males and females ($t = 1.88$, $df = 146$, $p > 0.01$). Males (mean 39.24, SD = 17.82) reported insignificantly higher performance than females (Mean = 32.72, SD = 15.81).

iii. *Relationship between Calculus Anxiety and Calculus Achievement (males and females combined)*

A bivariate correlation test was conducted to calculate the Pearson correlation coefficient between Mathematics anxiety and Calculus performance. The results obtained indicated a weak negative correlation between Mathematics anxiety and Calculus performance ($r = -0.036$, $p > 0.01$). Also, a paired samples statistics produced non significant correlation ($t = 0.613$, $df = 147$, $p > 0.01$, $r = -0.036$). Mathematics anxiety (mean = 38.89, SD = 10.77) and Calculus performance (mean = 37.83, SD = 17.55).

iv. *Relationship between Calculus Anxiety and Calculus Achievement (males only)* Paired sample test and bivariate correlation test on the male scores produced the Pearson correlation coefficient ($r = 0.041$, $t = -1.127$, $df = 115$, $P > 0.05$). This indicates a weak positive correlation.

v. *Relationship between Calculus Anxiety and Calculus Achievement (females only)*

Paired sample test and bivariate correlation test on the male scores produced the Pearson correlation coefficient ($r = -0.109$, $t = 3.652$, $df = 31$, $P < 0.01$). This indicates a

significant negative correlation.

DISCUSSION

The results of the data analysis showed a significant difference in Mathematics Anxiety between males and females. The computed means and standard deviations indicated that females have higher anxiety in Mathematics than their male counterpart. This confirms the previous researches which report higher Mathematics anxiety of females than males. (Yezici and Ertekin, 2010; Maloney et al., 2012; Wigfield and Meece, 1988). According to the results obtained in this study, there is no significant difference in Calculus performance between males and females. This is parallel to the previous finding (Penner and Paret, 2008; Eriksson and Lindholm, 2007; Else-Quest et al., 2010). The overall average performance was less than forty (37.8). A weak negative correlation between Mathematics anxiety and Calculus performance was observed. This indicates a very weak relationship between Mathematics anxiety and students' performance in calculus. This contradicts the hypothesis that there is relationship between Mathematics anxiety and Calculus achievement among the students. This result is opposed to the findings that reported a significant relationship between Mathematics Anxiety and Mathematics Performance (Ashcraft and Kirk, 2001; Karemi and Venkatesan, 2009). When males' and females' results were analyzed separately, two different outcomes were observed. For males, an insignificant weak positive correlation was observed and a negative significant correlation was indicated in females.

CONCLUSION AND RECOMMENDATIONS

This study was able to reveal the relationship between Mathematics Anxiety and Calculus Achievement. There is an insignificant positive correlation between Mathematics Anxiety and Calculus Achievement in males. The study also revealed significant negative correlation between Mathematics Anxiety and Calculus Achievement in females. Conclusively, there is a negative weak correlation between Mathematics anxiety and Calculus performance in both groups of students. The mean anxiety in females is higher than that of males. This indicates that there is a significant difference in Mathematics anxiety between males and females. There is no significant difference in the Calculus performance between males and females. Generally, the performance in calculus was below average according to this result.

Teachers are expected to modify their approach in teaching to make it friendly and practically oriented. Psychological aid should also be given to complement the method of teaching. Further research should be conducted on anxiety in different areas of Mathematics and

other academic levels.

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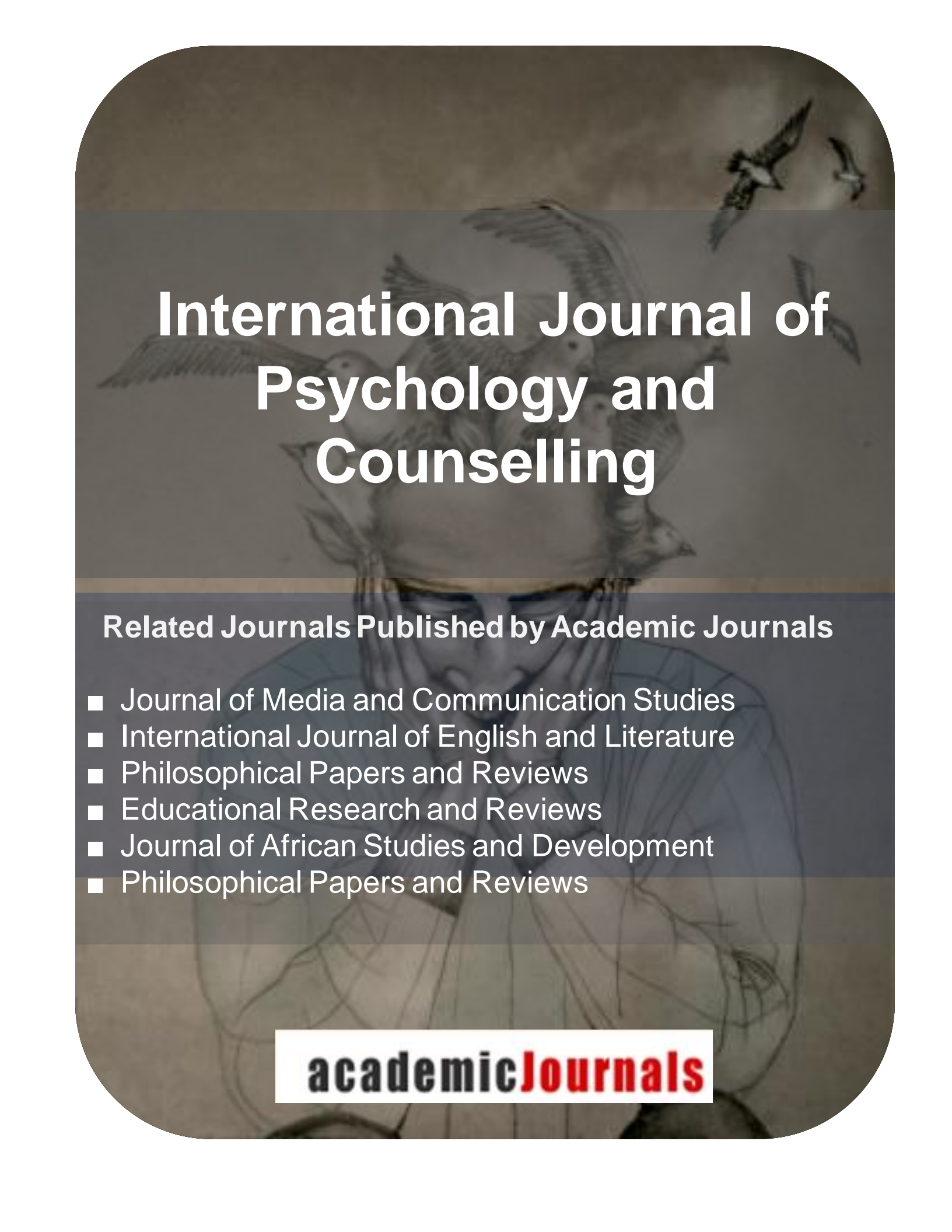
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