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Writing Complexity, Accuracy, and Fluency among EFL Learners: Inspecting Their Interaction with Learners' Degree of Creativity

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Abstract—Based on the peculiarities of developing second language (L2) writing among English as a Foreign Language (EFL) learners and the significance of studying the way writing skill interacts with EFL learners' internal factors, the present study attempted to inspect the relationship between EFL learners' creativity, on one hand, and writing complexity, writing accuracy, and writing fluency, on the other hand. The participants of the study were 185 male and female adult Iranian EFL learners ($M_{age} = 26$). The Persian version of O'Neil, Abedi, and Spielberger's (1992) Creativity Questionnaire, validated by Zaker (2013), was employed in order to estimate participants' degree of creativity. Participants' two exploratory and descriptive writings were analyzed through employing the Profile of Larsen-Freeman (2006) by two raters in order to estimate participants' writing complexity, accuracy, and fluency. Through running Pearson's Product-moment correlations it was indicated that there are significant correlations between participants' creativity and writing accuracy, $\rho = .84$, $n = 185$, $p < .05$; creativity and writing fluency, $\rho = .77$, $n = 185$, $p < .05$; and creativity and writing complexity, $\rho = .69$, $n = 185$, $p < .05$. Moreover, running three linear regressions revealed that Creativity can predict 70.1 percent of participants' writing accuracy ($R = .837$, $R^2 = .701$); 60 percent of their writing fluency ($R = .775$, $R^2 = .600$); and 47.5 percent of their writing complexity ($R = .689$, $R^2 = .475$). The study concludes with a discussion on the findings and stating a number of recommendations for further research.

Index Terms—creativity, second language writing, writing accuracy, writing complexity, writing fluency

I. INTRODUCTION

Writing as one of the main and productive skills and a significant requirement for English as a Foreign Language (EFL) learners is regarded to be one of the most important communicative skills in English language learning (Hayes & Flower, 1986; Sharples, Goodlet, & Pymberton, 1989). Writing's significance in learning language has been acknowledged by many researchers and educators (Richards & Renandya, 2002). While most people have no difficulty in being proficient in other language skills in their native languages, becoming a skilled writer even in the mother tongue is quite challenging; let alone becoming a competent writer in second or foreign language (Gregersen, 2003). For instance, in the Iranian context, as an EFL context, a number of researchers (Hasani & Moghadam, 2012; Mirzaii, 2012) have reported that the writing performance of Iranian Second language (L2) learners is not satisfactory. Based on these points, English language teaching circles are paying further attention to writing skill (Seidlhofer & Widdowson, 1999).

Writing is often considered as the most difficult skill to be mastered because of its complexity. Hapsari (2011) argues that writing is generally known as the most difficult of the four skills. The difficulty is seen in generating and organizing ideas and the mastery of the different aspects of writing such as grammar, spelling, word choice, punctuation, and so on. Researchers in the area of second/foreign language learning (Ellis, 2003; Ellis & Barkhuizen, 2005; Skehan 1998) are now in agreement that L2 proficiency, in general, and writing proficiency, in particular, are multi-componential in nature, and that their principal dimensions can be adequately, and comprehensively, captured by the notions of complexity, accuracy and fluency (CAF; Housen & Kuiken, 2009).

Skehan and Foster (1997) define writing complexity as, "Learners' capacity to use more elaborate and complex target like language" (p. 230). According to Skehan (1996), complexity is "the stage and elaboration of the underlying inter language system" (p. 46), which utilizes complicated and structured inter-language (Skehan, 1998). Writing accuracy refers to "the extent to which the language produced conforms to the target language norms" (Skehan & Foster, 1996, p. 232). Skehan (1996) also defines accuracy as a characteristic concerning "a learner's capacity to handle whatever level of inter-language complexity s/he has currently attained" (p. 46); that is, how similar produced language is to the target language. Finally, fluency is defined as "the number of words produced in a specified time frame, together with lexical

frequency, irrespective of spelling and content, provided that the writer's meaning is readily understandable" (Fellner & Apple, 2006, p. 19).

According to Housen and Kuiken (2009), "CAF have been used both as performance descriptors for the oral and written assessment of language learners as well as indicators of learners' proficiency underlying their performance; they have also been used for measuring progress in language learning" (p. 461). The origins of CAF lie in research on L2 pedagogy where in the 1980s a distinction was made between fluent versus accurate L2 usage to investigate the development of oral L2 proficiency in classroom contexts. One of the first to use this dichotomy was Brumfit (1984) who distinguished between fluency-oriented activities, which foster spontaneous oral L2 production, and accuracy-oriented activities, which focus on linguistic form and on the controlled production of grammatically correct linguistic structures in the L2. The third component, complexity, was added in the 1990s, following Skehan (1989) who proposed an L2 model which for the first time included CAF as the three principal proficiency dimensions.

The quality of writing is not simply restricted to the learning of linguistic items and gaining mastery over different dimensions of performance. In essence, the way people produce language in both oral and written forms may have been affected by different factors (Nosratinia, Abbasi, & Zaker, 2015). Dörnyei (2005) highlights the importance of studying factors such as personality types, self-regulation, self-esteem, and creativity which are considered as individual differences that have great effect on language learning, especially writing.

Researchers and educators have concentrated on the development of learners' creativity since its enhancement is considered as one of the top goals in all societies (Baucus, Norton, Baucus, & Human, 2008). Creativity is one of the most important cognitive factors whose role in writing has been acknowledged by the majority of L2/EFL researchers (Tse & Shum, 2000). The concept of creativity first was introduced by Goltan (1869). Lots of works have been done since then to define creativity. "Creativity is generally characterized as the ability to create new and original products which are considered appropriate for the features and limitations of a given task, where products can refer to a variety of ideas, viewpoints, and innovations" (Lubart, 1994, p. 15). "These products must be original as they should not be just a mere copy of what already exists" (Lubart & Guignard, 2004, p. 43).

As Sarsani (2005) stated, "Philosophy sees creativity as a process of change" (p. 132). Education must thus "Enable people to generate and implement new ideas and to adapt positively to different changes in order to survive in the current world" (Jeffrey, Craft, & Leibling, 2001, p. ix). To this end, according to Agarwal (1992), developing creativity at all levels in the educational system seems critical in improving educational attainment and life skills.

Considering the stated contribution of creativity to learning language skills (e.g. writing) and the significance of CAF in determining L2 writing quality, the present study aims to investigate the relationship between creativity, on one hand, and the three dimensions of writing (i.e. complexity, accuracy, and fluency), on the other hand, in an EFL context. A further objective of this study was to determine the extent to which CAF are predicted by EFL learners' creativity. In order to accomplish these objectives, the following research questions were formulated:

Q₁. Is there any significant relationship between EFL learners' creativity and writing accuracy?

Q₂. Is there any significant relationship between EFL learners' creativity and writing fluency?

Q₃. Is there any significant relationship between EFL learners' creativity and writing complexity?

Considering the observed significant relationship among the variables, the following research questions were posed:

Q₄. How much can EFL learners' creativity predict their writing accuracy?

Q₅. How much can EFL learners' creativity predict their writing fluency?

Q₆. How much can EFL learners' creativity predict their writing complexity?

II. METHOD

Participants

The participants of the present study were 185 intermediate male and female (30 males and 155 females) EFL learners studying English in three language schools, namely Iranmehr, Shokuh, and Zabansara in Tehran. Their ages ranged from 20 to 32 ($M_{\text{age}} = 26$). The process of participants' selection was done conveniently, i.e. the available intermediate students were asked to participate in the study. The preliminary number of participants was 250, but 65 of them were excluded from data analysis due to careless coding, and incomplete answers bringing the final number to 185 participants.

Furthermore, two English teachers (one of the researchers and one of her colleagues holding an MA degree in TEFL) participated in this study as the raters of the writing papers. In order to estimate the inter-rater reliability between the two raters, a randomly selected cluster of writing compositions, including 28 sets of compositions, scored by the two raters was employed. Running Pearson correlations between these score sets indicated that there were significant agreements between the scores of writing accuracy ($r(28) = .80, P < .05$ representing a large effect size), writing fluency ($r(28) = .88, P < .05$ representing a large effect size), and writing complexity ($r(28) = .74, P < .05$ representing a large effect size) as provided by the two raters. As a result, it was appropriate to employ the mean of the two scores provided by the two raters as the final score for each participant's writing performance (indicating CAF).

Instrumentation

Creativity Questionnaire

In this study, creativity was operationally defined as the scores participants received on the Persian version of Creativity Test. The original English questionnaire was designed by O' Neil, Abedi, and Spielberger in 1992, translated into Persian by Daemi and Moghimi (2004), and validated by Zaker (2013). The validated questionnaire (Zaker, 2013) contains 50 three-point Likert items. Responses to the individual items are scored on a scale ranging from 0 to 2, from the least to the most creative response. The allocated time for answering the questionnaire is 50 minutes, and the total scores fall within the range of 0 to 100.

According to Zaker (2013), the internal consistency of the Persian Creativity Test was estimated to be 0.85 employing Cronbach's alpha coefficient. In this study, the reliability of the Persian Creativity Test was estimated to be 0.93 using Cronbach's alpha coefficient.

Two Compositions

The participants were asked to write two compositions on two different predetermined topics based on their course book in descriptive and exploratory types, namely:

1. *Describing the characteristics of a successful English teacher in Iran.*
2. *Unemployment is a problem facing many countries today. Explain how the governments can possibly reduce the rate of unemployment.*

The compositions consisted of 150 to 250 words. The participants had 50 minutes to write about each predetermined topic. The compositions had to have three parts -introduction, body paragraphs, and conclusion.

Profile of Larsen-Freeman

In order to score the two abovementioned compositions objectively, the researchers used the Profile of Larsen-Freeman (2006) which is a reliable rating scale. Larsen-Freeman (2006) conducted an in-depth analysis on English language learners' performance through an objective assessment. Through her study, Larsen-Freeman (2006) introduced a profile which utilized T-units in assessing both oral and written language productions in terms of accuracy, fluency, and complexity. Larsen-Freeman (2006) defined writing accuracy, fluency, and complexity as follows:

a) Accuracy: The proportion of error-free T-units to total T-units (in terms of lexical, morphological, and syntactic errors);

b) Fluency: The average number of words per T-unit; &

c) Complexity: The total number of clauses divided by the total number of T-units.

T-Unit Guideline

Polio (1997) developed a guideline through which the systematic determination of T-units and errors is possible. The concept of T-unit has been defined as "one main clause with all subordinate clauses attached to it" (Hunt, 1965, p. 20). T-units are usually employed for analyzing written and spoken discourse because it has been proven that T-units are strongly correlated to language proficiency (Ellis & Barkhuizen, 2005; Wolfe-Quintero, Inagaki, & Kim, 1998). In this study, the researchers used this guideline to determine T-units, in the first place, then, used the Profile of Larsen-Freeman (2006) in order to determine the scores of CAF.

Procedure

Initially, the Persian version of the Creativity Test (Zaker, 2013) was administered to 250 male and female EFL learners (see participants). The participants were fully briefed on the process of completing the questionnaire. Also, the researchers announced that the results of the questionnaire would just be used for the sake of the academic value of this research. The researchers observed the process of filling out randomly to make sure that the participants were capable to fully understand the questions and responses. The completed questionnaires were collected (after 50 minutes) and scored by the researchers, revealing that from the initial 250 administered questionnaires, only a number of 185 questionnaires were answered completely and were usable for the statistical analyses.

In the two following sessions, the 185 participants were asked to take part in two composition writing tests and write two different descriptive and exploratory type essays. The participants had 50 minutes to write each composition. Their performances were scored objectively in terms of accuracy, complexity and fluency by two raters (see participants) following the Profile of Larsen-Freeman (2006) and Polio's (1997) guidelines for T-units and error analyses.

As stated above, (see instrumentation), in order to estimate the writing accuracy, the proportion of the error-free T-units to the total T-units were calculated. For finding out the writing fluency, the average number of words per T-unit was taken into account, and, finally, in order to score the writing complexity, the total number of clauses divided by the total number of T-units was calculated. This was followed by the statistical procedures whose results are stated in the following sections.

III. RESULTS

This descriptive study investigated the way EFL learners' creativity and their writing accuracy, writing complexity, and writing fluency are associated. To do so, a series of pertinent calculations and statistical routines were conducted which are presented below.

Preliminary Analyses

The data were analyzed through running Pearson's Product-moment correlation coefficient and linear regression, both of which share a number of assumptions, namely normality, linearity, and homoscedasticity. The last two will be discussed later; however, the assumption of normality is discussed here through using two methods, the Skewness and

Kurtosis Ratio test and Kolmogorov-Smirnov test. As displayed in Table 1, the ratios of skewness and kurtosis were within the range of ± 1.96 ; this supported the normality of the data.

TABLE 1:
DESCRIPTIVE STATISTICS; TESTING NORMALITY ASSUMPTION

| | N | Skewness | | Kurtosis | |
|------------|-----|-----------|------------|-----------|------------|
| | | Statistic | Std. Error | Statistic | Std. Error |
| Creativity | 185 | -.116 | .179 | -0.65 | .137 |
| Accuracy | 185 | .132 | .179 | 0.74 | .141 |
| Fluency | 185 | .118 | .179 | 0.66 | .095 |
| Complexity | 185 | .043 | .179 | 0.24 | -.438 |

The normality of the present data was also supported by the inspection of the normal probability plots, Normal Q-Q Plots. As displayed in Table 2, the Kolmogorov-Smirnov indices of normality were all non-significant ($p > .05$); this backed up the normality of the present data.

TABLE 2:
TESTS OF NORMALITY

| | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|------------|--------------------|-----|-------|--------------|-----|------|
| | Statistic | Df | Sig. | Statistic | df | Sig. |
| Creativity | .056 | 185 | .200* | .994 | 185 | .595 |
| Accuracy | .057 | 185 | .200* | .989 | 185 | .181 |
| Fluency | .061 | 185 | .095 | .994 | 185 | .616 |
| Complexity | .064 | 185 | .065 | .987 | 185 | .096 |

Answering the Research Questions

Owing to the fact that the assumptions of normality, as stated above, were met, parametric formulas could be employed in order to answer the research questions. The following sections present the results.

The First Research Question

Regarding the relationship between creativity and writing accuracy, the assumptions of linearity and homoscedasticity were met (Figure 1). As demonstrated in Figure 1, the spread of dots clustered around the diagonal which supports the linearity of the relationship between the two variables. The spread of dots does not show a funnel shape distribution, narrow at one end and wide at the other. Thus, the assumption of homoscedasticity was also met.

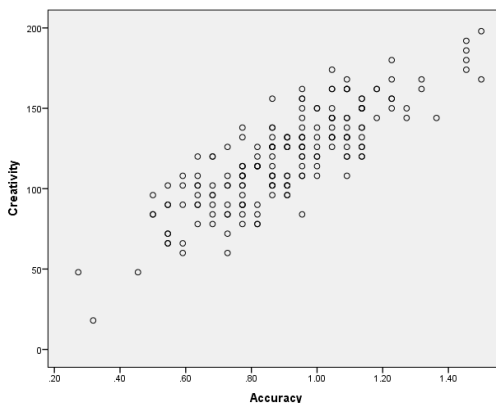


Figure 1: Relationship between writing accuracy and creativity

The results of the Pearson correlation ($r(185) = .83, p < .05$, representing a large effect size; Table 3) indicated that there was a significant relationship between EFL learners' creativity and writing accuracy.

TABLE 3:
PEARSON CORRELATION; WRITING ACCURACY WITH CREATIVITY

| | | Creativity |
|----------|---------------------|------------|
| Accuracy | Pearson Correlation | .837** |
| | Sig. (2-tailed) | .000 |
| | N | 185 |

** Correlation is significant at the 0.05 level (2-tailed).

The Second Research Question

Regarding the relationship between creativity and writing fluency, as demonstrated in Figure 2, the cluster of spread of dots around the diagonal and the lack of any funnel shape distribution seem to support the assumptions of linearity and homoscedasticity.

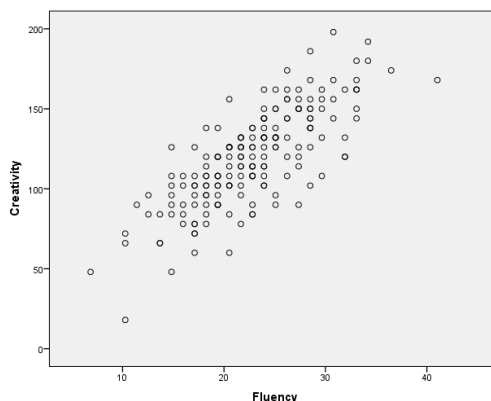


Figure 2: Relationship between writing fluency and creativity

The results of the Pearson correlation ($r(185) = .77, p < .05$, representing a large effect size; Table 4) indicated that there was a significant relationship between EFL learners' creativity and writing fluency.

TABLE 4:
PEARSON CORRELATION; WRITING FLUENCY WITH CREATIVITY

| | | Creativity |
|---------|---------------------|------------|
| | Pearson Correlation | .775** |
| Fluency | Sig. (2-tailed) | .000 |
| | N | 185 |

** . Correlation is significant at the 0.05 level (2-tailed).

The Third Research Question

Regarding the relationship between creativity and writing complexity, Figure 3 demonstrates the cluster of spread of dots around the diagonal and the lack of any funnel shape distribution; as a result, the assumptions of linearity and homoscedasticity were met.

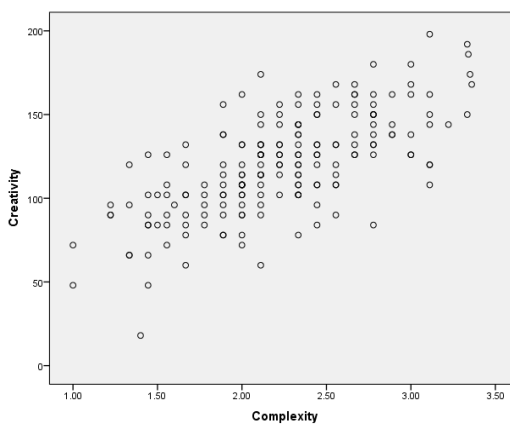


Figure 3: Relationship between writing complexity and creativity

The results of the Pearson correlation ($r(185) = .69, p < .05$, representing a large effect size; Table 5) indicated that there was a significant relationship between EFL learners' creativity and writing complexity.

TABLE 5:
PEARSON CORRELATION; WRITING COMPLEXITY WITH CREATIVITY

| | | Creativity |
|------------|---------------------|------------|
| | Pearson Correlation | .689** |
| Complexity | Sig. (2-tailed) | .000 |
| | N | 185 |

** . Correlation is significant at the 0.05 level (2-tailed).

The Fourth Research Question

A linear regression was run to probe how much EFL learners' creativity can predict their writing accuracy. Based on the results displayed in Table 6, it was concluded that creativity can predict 70.1 percent of EFL learners' writing accuracy ($R = .837, R^2 = .701$). The adjusted R^2 -value was .700. Moreover, the difference between the observed and adjusted R^2 ($.701 - .700 = .001$) indicated that the observed predictive power had .001 (.01 percent) difference with the

population index. Based on these results, it was concluded that the regression model has appropriate generalizability power.

TABLE 6:
MODEL SUMMARY^a (CREATIVITY AND WRITING ACCURACY)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .837 ^a | .701 | .700 | .12469 | 1.193 |

a. Predictors: (Constant), Creativity

b. Predicted Variable: Accuracy

The Durbin-Watson (DW) index of 1.19 indicated that the assumption of independence of errors was met. Table 7 examines the statistical significance of the regression model. The results ($F(1, 183) = 429.70$, $P < .05$, $\omega^2 = .69$ representing a large effect size) indicated that creativity significantly predicted writing accuracy.

TABLE 7:
ANOVA^a (CREATIVITY AND WRITING ACCURACY)

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1 | Regression | 6.681 | 1 | 6.681 | 429.708 | .000 ^b |
| | Residual | 2.845 | 183 | .016 | | |
| | Total | 9.527 | 184 | | | |

a. Predicted Variable: Accuracy

b. Predictors: (Constant), Creativity

TABLE 8:
COEFFICIENTS^a (CREATIVITY AND WRITING ACCURACY)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. | Collinearity Statistics | |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .150 | .038 | | 3.979 | .000 | | |
| | Creativity | .006 | .000 | .837 | 20.729 | .000 | 1.000 | 1.000 |

a. Predicted Variable: Accuracy

As reported in Table 8, the beta value of .837 indicated that one full standard deviation change in creativity resulted in .837 standard deviation change in writing accuracy. The results of the *t*-test ($t = 20.72$, $P < .05$) indicated that the beta value enjoyed statistical significance. The other two important statistics, i.e. Tolerance and VIF, indicated that the assumption of lack of collinearity was met.

The Fifth Research Question

A linear regression was run to probe how much EFL learners' creativity can predict their writing fluency. Based on the results displayed in Table 9, it can be concluded that creativity can predict 60 percent of EFL learners' writing fluency ($R = .775$, $R^2 = .600$). The adjusted R^2 -value was .598. The difference between the observed and adjusted R^2 ($.600 - .598 = .002$) indicated that the observed predictive power had .002 (.02 percent) difference with the population index. Based on these results, it was concluded that the regression model has appropriate generalizability power.

TABLE 9:
MODEL SUMMARY^a (CREATIVITY AND WRITING FLUENCY)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .775 ^a | .600 | .598 | 3.608 | 1.668 |

a. Predictors: (Constant), Creativity

b. Predicted Variable: Fluency

The Durbin-Watson (DW) index of 1.66 indicated that the assumption of independence of errors was met. Table 10 examines the statistical significance of the regression model. The results ($F(1, 183) = 274.52$, $P < .05$, $\omega^2 = .59$ representing a large effect size) indicated that creativity significantly predicted writing fluency.

TABLE 10:
ANOVA^a (CREATIVITY AND WRITING FLUENCY)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1 | Regression | 3573.678 | 1 | 3573.678 | 274.528 | .000 ^b |
| | Residual | 2382.213 | 183 | 13.018 | | |
| | Total | 5955.891 | 184 | | | |

a. Predicted Variable: Fluency

b. Predictors: (Constant), Creativity

TABLE 11:
COEFFICIENTS^a (CREATIVITY AND WRITING FLUENCY)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | 5.294 | 1.091 | | 4.851 | .000 | | |
| | Creativity | .146 | .009 | .775 | 16.569 | .000 | 1.000 | 1.000 |

a. Predicted Variable: Fluency

As reported in Table 11, the beta value of .775 indicated that one full standard deviation change in creativity resulted in .775 standard deviation change in writing fluency. The results of the *t*-test ($t = 16.56$, $P < .05$) indicated that the beta value enjoyed statistical significance. Tolerance and VIF values indicated that the assumption of lack of collinearity was met.

The Sixth Research Question

A linear regression was run to probe how much EFL learners' creativity can predict their writing complexity. Based on the results displayed in Table 12 it can be concluded that creativity can predict 47.5 percent of EFL learners' writing complexity ($R = .689$, $R^2 = .475$). The adjusted R^2 -value was .472. The difference between the observed and adjusted R^2 ($.475 - .472 = .003$) indicated that the observed predictive power had .003 (.03 percent) difference with the population index. Based on these results, it was concluded that the regression model has appropriate generalizability power.

TABLE 12:
MODEL SUMMARY^b (CREATIVITY AND WRITING COMPLEXITY)

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1 | .689 ^a | .475 | .472 | .37753 | .867 |

a. Predictors: (Constant), Creativity

b. Predicted Variable: Complexity

The Durbin-Watson (DW) index of .86 indicated that the assumption of independence errors was not met. As noted by Field (2013), DW indices between 1 and 3 are acceptable. If errors are correlated, the findings may not be generalized to population. The R^2 -value of .475 indicated that the creativity can predict less than 50 percent of writing complexity. Table 13 examines the statistical significance of the regression model. The results ($F(1, 183) = 165.41$, $P < .05$, $\omega^2 = .47$ representing a large effect size) indicated that the creativity significantly predicted writing complexity.

TABLE 13:
ANOVA^a (CREATIVITY AND WRITING COMPLEXITY)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|---------|-------------------|
| 1 | Regression | 23.576 | 1 | 23.576 | 165.413 | .000 ^b |
| | Residual | 26.083 | 183 | .143 | | |
| | Total | 49.659 | 184 | | | |

a. Predicted Variable: Complexity

b. Predictors: (Constant), Creativity

TABLE 14:
COEFFICIENTS^a (CREATIVITY AND WRITING COMPLEXITY)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .802 | .114 | | 7.026 | .000 | | |
| | Creativity | .012 | .001 | .689 | 12.861 | .000 | 1.000 | 1.000 |

a. Predicted Variable: Complexity

As reported in Table 14, the beta value of .689 indicated that one full standard deviation change in creativity resulted in .689 standard deviation change in writing complexity. The results of the *t*-test ($t = 12.86$, $P < .05$) indicated that the beta value enjoyed statistical significance. Tolerance and VIF values indicated that the assumption of lack of collinearity was met.

IV. DISCUSSION

Writing is known to present a fairly challenging task for both teachers and learners (Ferris, 2003; Kroll, 1994). As rightly stated by Alexandra (2001), "Writing is undoubtedly one of the most difficult skills in learning a second language." (p. 257); the Iranian context, as an example, has shown the challenge that EFL learners are faced with in developing writing skills (Hasani & Moghadam, 2012; Mirzaii, 2012). Therefore, attempts should be made to enhance our level of understanding about writing skill and factors affecting it (Ashwell, 2000; Chandler, 2003; Fazio, 2001). To do so, the first step seems to be obtaining an objective estimation about EFL learners' writing performance. Such an estimation on the principal dimensions of writing can be captured by the notions of complexity, accuracy and fluency (CAF; Housen & Kuiken, 2009).

According to Housen and Kuiken (2009), "CAF have been used both as performance descriptors for the oral and written assessment of language learners as well as indicators of learners' proficiency underlying their performance; they have also been used for measuring progress in language learning" (p. 461). Assuming that CAF can be the legitimate representative of writing skill, it seems reasonable to inspect the way CAF interact with other factors (Seidlhofer & Widdowson, 1999). One major category of learning-affecting factors are learners' cognitive, metacognitive, and, generally, internal factors (Dörnyei, 2005, Fahim & Zaker, 2013; Lightbown & Spada, 2013; Nosratinia & Zaker, 2014, 2015; Zaker, 2015). Creativity is one of the most important internal factors whose role in writing has been acknowledged by the researchers (Tse & Shum, 2000).

Based on the abovementioned premises, the present study attempted to investigate the relationship between creativity, on the one hand, and the three dimensions of writing, CAF, on the other hand, among EFL learners. The results of the statistical analyses in the current study indicated that:

- 1) there is a significant correlation between creativity and writing accuracy, $\rho = .84$, $n = 185$, $p < .05$;
- 2) there is a significant correlation between creativity and writing fluency, $\rho = .77$, $n = 185$, $p < .05$;
- 3) there is a significant correlation between creativity and writing complexity, $\rho = .69$, $n = 185$, $p < .05$;
- 4) creativity can predict 70.1 percent of EFL learners' writing accuracy ($R = .837$, $R^2 = .701$);
- 5) creativity can predict 60 percent of EFL learners' writing fluency ($R = .775$, $R^2 = .600$); and
- 6) creativity can predict 47.5 percent of EFL learners' writing complexity ($R = .689$, $R^2 = .475$).

The abovementioned findings confirm the results of previous studies, accentuating the role of creativity in L2 achievement (Ai, 1999; Atkinson, 2004). The results are also in line with the findings of Naderi, Abdullah, Aizan, Sharir, and Kumar (2009) which supported the positive relationship between creativity and academic achievement among Iranian EFL learners. More specifically, the results indicated that creativity and accuracy have the highest relationship, followed by fluency. The relationship between creativity and writing complexity was the lowest one. Yet, all the relationships had large effect sizes. These findings seem to provide further systematic support for the previous researches on the relationship between creativity and writing (Pishghadam & Javan Mehr, 2011; Soleimani & Najafgholian, 2014).

As stated above, complexity of learners' writing compositions exhibited the lowest correlation with their creativity which predicted only 47.5 percent of participants' writing complexity. One possible reason for this might be the trade-off between accuracy and fluency, on one hand, and complexity, on the other. According to Limited Attentional Capacity Model (Skehan, 1996), human beings have a restricted information processing capacity, and the more complicated the tasks are, the more attentional resources the L2 learners require (Skehan, 1998, 2001). Accordingly, trade-off effects may exist among the three dimensions of language production (CAF; Skehan & Foster, 2001). In other words, as focus is put on the accuracy, the complexity and fluency of the production may be less and vice versa.

The results also indicate that although creative people might think differently and complicatedly, when it comes to writing, they seem to have more focus on the accuracy and fluency of their work than the complexity. McLain (1993), in investigating the role of creativity in teaching and learning second language, concluded that creative learners are more willing to take risks and more open to changes. Yet, the obtained results showed that creativity is more associated with accuracy than complexity in writing.

The findings of the present study can highlight the influential factors in developing writing among EFL learners. This gives EFL teachers and researchers the information required to humanize the process of writing instruction (Ashwell, 2000; Chandler, 2003; Fazio, 2001). The findings not only lead to a better understanding about the nature of writing difficulties, but, more importantly, they could lead to finding a reliable way to treat learners' weaknesses and problems in developing their writing skills.

The results of the current study have implications for EFL learners, encouraging them to become more creative about their learning activities. Being creative is among the critical factors in supporting life-long learning in general and writing effectively in particular. On the other hand, syllabus designers and material developers need to consider the significance of creativity in EFL programs and incorporate creativity in course books and other materials. Moreover, relevant training hints or motives regarding creativity and the three dimensions of writing (CAF) should be inserted in appropriate parts of EFL programs and course books.

Based on the limitation and the focus of this study, other researchers are encouraged to inspect the relationship between creativity and other specific features of the writing (e.g. formality degree). It is also suggested to inspect the relationship between creativity and speaking accuracy, fluency, and complexity. Other studies can also investigate the relationship between CAF and other learner factors (e.g. critical thinking, self-regulation, and motivation). Finally, this study can be replicated among other age groups to inspect the generalizability of the findings.

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