CREATIVITY AND NARRATIVE TASK PERFORMANCE: AN EXPLORATORY STUDY

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ABSTRACT

The aim of this article is to investigate the effect of creativity on performance in oral narrative tasks. Participants of the study were Hungarian learners whose creativity was measured with a standardised creativity test. We examined the relationships between three aspects of creativity: originality, flexibility, and creative fluency, and different measures of task performance.

The findings suggest that the three components of creativity have a differential effect on the measures of task performance. Creative fluency was positively correlated with the quantity of talk. Originality was negatively related to the quantity of talk, and positive correlations were found between originality and the complexity of narratives. The magnitude of the correlations indicates that creativity affects participants’ output in narrative tasks only moderately.
Introduction

Many of the individual differences that exist between learners have been studied in an attempt to account for the differential success in second language acquisition. The relevance of several cognitive, motivational, personality and social factors has been revealed, but there is one complex phenomenon, the importance of which has not been thoroughly explored to this day, and this is learner creativity. If the creative process is regarded as a rare phenomenon observable only in the exceptionally talented, its relevance for the millions of average people learning foreign languages is obviously negligible. If, however, creativity is hypothesised to be a special arrangement of those cognitive, motivational, personality or social characteristics that are present in everyone, its effects on second language acquisition cannot be disregarded. A number of researchers (Barkóczi and Zétényi, 1981; Cropley, 1972; Guilford, 1950; Harrington, Block, and Block, 1983; Mednick, 1962) believe that the underlying components of creativity are normally distributed in the population. Therefore creativity, which implicitly involves imagination, unconventionality, risk-taking, flexibility, and creating new classifications and systematisations of knowledge (Sternberg, 1985a), might be a factor that affects second language acquisition.

The changing methods of second language instruction, the prominence of methods of communicative and task-based language teaching, which in many cases employ tasks that require students to use their imagination, provides another reason why researching this variable should become imminent. Tasks that involve the use of imagination and the generation of new ideas might provide creative learners with more chance to practise, that is, to produce more comprehensible output, which could lead to greater success in second language acquisition (Swain, 1985). This might be even more so in a foreign language environment, where output is mainly produced in the classroom. Support for this line of argumentation was provided by Ottó (1998), who, in a small-scale study involving Hungarian secondary school learners instructed by communicative methods, found significant positive correlations between different measures of learner creativity and students’ end-of-year English grades.

It is not obvious, however, whether the effects of an individual variable like creativity can only be observed in general outcomes of second or foreign language learning, such as achievement as reflected by English grades (Ottó, 1998) and presumably proficiency test results, or if these effects can also be detected in much smaller and more specific units of learner performance, such as tasks (see Dewaele and Furnham (1999) on the relationship of
extraversion and oral task performance). The research presented in this paper aimed to investigate the effects of learner creativity on several output variables of one particular task type, the oral narrative task, while controlling for the differences in the participants’ level of proficiency. Since oral narrative tasks generally involve storytelling based on some cue, this task type seems to lend an opportunity for learners to use their imagination; therefore, it was found particularly well suited for demonstrating the effects of creativity. This exploratory study involved 35 Hungarian learners of English and used a correlational design. The initial assumption of the research was that creativity enhances the participants’ performance on the oral narrative task, resulting in both quantitatively and qualitatively superior performance on the output variables examined.

Creativity

When trying to define the construct of creativity, the first difficulty encountered is that this concept covers a wide range of distinct but related phenomena: the creative performance or product, the creative person, the creative situation, the creative process and the creative potential (Brown, 1989; Lubart, 1994). Therefore, when attempting to define this concept, one of the first tasks should be restricting the scope of our investigation and specifying the area or aspect of creativity that is to be examined. This means that for lack of space neither theories of the creative process (see Finke, Ward, and Smith, 1992; Hayes, 1989; Wallas, 1970) nor theories for evaluating creative products (see Finke et al., 1992) will be discussed here. Similarly, although theories of personality also address the issue of creativity and evidence suggests that it might be strongly related to the Openness to Experience factor of the Big Five model of personality (McCrae, 1987), attributes of the creative personality will not be discussed here either. The present investigation will focus on the creative potential, that is, the cognitive underpinnings of the creative working of the mind.

Theories of creativity, similarly to the wide range of issues covered by it, are numerous. Authors working within the psychodynamic (Freud, 1908/1959; Kris, 1952), the humanistic (Csikszentmihalyi, 1988; Maslow, 1968; Rogers, 1954) as well as the socio-psychological (Amabile, 1983, 1996) approaches have put forward theories in an attempt to account for this phenomenon. Although as proponents of recent models of creativity (Amabile, 1983, 1996; Sternberg, and Lubart, 1991, 1996) rightly point out, creativity is probably best hypothesised as a complex interplay of several cognitive, personality, motivational, and social factors, they also state that intellectual abilities are arguably among
the most important components of creativity (Lubart, 1994). Therefore, the approach chosen in this article, which concentrates purely on the cognitive factors underlying creativity, seems to be justifiable.

Guilford (1950) was among the first to put forward a list of cognitive processes involved in creativity. He believed that these processes include sensitivity to problems, creative fluency of production, ability to come up with novel ideas, flexibility of mind, synthesising ability, analysing ability, reorganisation or redefinition of organised wholes, a high degree of complexity of the conceptual structure, and evaluation. However, as Guilford (1959) later developed a comprehensive model of human intellect, he started to focus on divergent thinking, the ability to produce many different ideas in response to a problem, as the prime cognitive component of creativity. He suggested that it was an operation complementary to convergent thinking, the ability to find the correct solution to a problem; the cognitive process that he believed is tapped by the majority of intelligence tests. Divergent thinking is hypothesised to have four relatively independent facets: creative fluency, the ability to produce a large number of ideas, flexibility, the ability to produce a wide variety of ideas, originality, the ability to produce unusual ideas, and elaboration, the ability to develop or embellish ideas and to produce many details (Baer, 1993).

Today intellectual abilities considered to be relevant for creativity are usually grouped into two large categories: basic-level and high-level creativity-relevant abilities (Lubart, 1994). Basic-level creative abilities consist of two types: the above-described divergent thinking and different insight abilities comprising the capacities to notice relevant new information, to compare disparate information, to find relevant connections, and to combine information in a problem-relevant fashion. High-level abilities include problem-finding, problem-definition or redefinition, choosing a useful problem presentation, selecting an appropriate problem-solving strategy, and evaluating the generated possibilities effectively. It is interesting to note that some of these processes are hypothesised to be related to language aptitude within the CANAL-F theory, a framework of language aptitude recently developed by Grigorenko, Sternberg, and Ehrman (2000).

The two lists of creativity-relevant intellectual abilities have a number of common factors, which draws attention to the fact that in almost fifty years one thing certainly did not change: researchers believe that creativity rests on the same cognitive foundations as other intellectual abilities, such as intelligence. As a result, the cognitive abilities that form the basis of creativity are usually integrated into comprehensive theories of intellect (Carroll, 1993; Guilford, 1967; Sternberg, 1985b). Although theories of intellect bear relevance for theories
of creativity and provide a general frame of interpretation of the phenomenon, the drawback of this approach is that creativity becomes difficult to distinguish from other intellectual abilities in terms of purely cognitive factors.

Current factor-analytic research suggests, however, that factors of creativity-relevant intellectual abilities tend to load on one common higher-order factor called idea production, which provides empirical evidence of the autonomous existence of this ability. Carroll (1993), having reviewed and reanalysed 121 datasets, found nine basic factors to be relevant for idea production, which he believes is a basic human characteristic: ideational fluency, naming facility, associational fluency, expressional fluency, word fluency, sensitivity to problems, originality/creativity, figural fluency, and figural flexibility. In the term 'idea production', the notion of 'idea' is to be taken in the broadest possible sense: it can be any verbal proposition, but it may also be a gesture, a drawing, or a musical phrase. 'Production' is meant as a process distinct from recognition, identification, selection or comparison. Out of the nine factors, eight are primarily concerned with the speed of idea production and are differentiated on the basis of the type of the idea produced, whereas originality/creativity seems to determine the quality or level of idea production. Based on Carroll’s findings, idea production is usually measured by tasks which prompt examinees to quickly think of a series of responses. While this is true for all the tasks used to measure the nine factors, there is a special requirement when our aim is to measure originality/creativity. In that case the task itself needs to be difficult or challenging in order to urge respondents to go beyond the obvious and commonplace answers.

This factor-analytic investigation led to the formulation of Carroll’s (1993) three-stratum theory of cognitive abilities, where the concept of idea production is labelled general retrieval ability, the ability which is "involved in any task or performance that requires the ready retrieval of concepts or items from long-term memory" (p.625). Since it is a fundamental characteristic of factor-analysis that the input data determine the output, that is, the tests and tasks analysed and the scoring procedures employed necessarily influence and possibly constrain the outcome, further research is needed to clarify the structure of the domain of general retrieval ability. This could probably be achieved by devising more appropriate and highly reliable measurement procedures. It is also interesting that although Guilford’s (1959) Structure of Intellect model is not compatible with the results of the exploratory factor analysis on which the three-stratum theory is founded, still the domain of general retrieval ability "is chiefly (but not entirely) concerned with Guilford’s divergent production operation" (Carroll, 1993, p. 638).
When trying to assess a person’s creative potentials, usually two different approaches are taken. One option is measuring several non-cognitive aspects of creativity, such as personality and motivation, in addition to intellectual processes and intellectual style as was done by Sternberg and Lubart (1991), who tried to establish individual creativity this way. Although this approach is more in line with current constructs of creativity, it is not feasible in research designs where creativity needs to be operationalised as one single variable. The other option, therefore, is to try to assess divergent thinking, the intellectual ability that is thought to be most characteristic of the creative process (Guilford, 1967; Torrance, 1962). Although tests of divergent thinking have been criticised on many accounts (Jordan, 1975; Kogan and Pankove, 1974), because of their reported validity, reliability (Cropley, 1972; Harrington, Block, and Block, 1983) and their relative ease of use, they are still widely applied as indicators of individual creativity in research on individual variables (Ghadirian, Gregoire, and Kosmidis, 2000-2001; Jung, 2000-2001; Russ and Seja-Kaugars, 2000-2001). As McCrae (1987) pointed out, “although tests like Word Fluency certainly have limited face validity as measures of creativity, their ability to identify creative individuals is an empirical matter, and in fact they are reasonably successful in this” (p. 1258).

The above described difficulties might partly be held accountable for the fact that SLA research of individual learner variables has failed to investigate the effects of creativity although the influence of other cognitive variables such as intelligence, language aptitude and different learning and thinking styles have been researched widely (for reviews see Gardner and MacIntyre, 1992, 1993; Oxford and Ehrman, 1993; Skehan, 1989, 1991). We have made an attempt at bridging this gap by carrying out research on the effects of learner creativity on the performance of oral narrative tasks. For our purposes, creativity was defined as the person’s ability to come up with a large number of novel and statistically rare solutions on a given task and was operationalised as the total score achieved on a standardised creativity test (Barkóczi and Zétényi, 1981).

Tasks in SLA research

During the past two decades foreign language teaching has become more and more characterised by the communicative approach to language teaching, whose main objective is “to develop the learner’s ability to take part in spontaneous and meaningful communication in different contexts, with different people, on different topics, for different purposes” (Celce-Murcia, Dörnyei, and Thurrell, 1997, p. 149). A relatively new approach within this
framework is task-based instruction, which calls for language teaching to be organised around different tasks (Long, and Crookes, 1993; Pica, Kanagy, and Falodun, 1993; Plough, and Gass, 1993; Skehan, 1998; Willis, and Willis, 1996). Consequently, tasks, more specifically their components, characteristics, different types, and implementation conditions, have been the focus of much recent research. Although by placing emphasis on different aspects of tasks, various authors (e.g. Bygate, 1999; Candlin, 1987; Long, 1985; Nunan, 1989) suggest slightly different definitions, in this article Skehan’s (1996) comprehensive definition was adopted which states that a task is “an activity in which: meaning is primary; there is some relationship to the real world; task completion has some priority; and the assessment of task performance is in terms of task outcome” (p. 38).

The ordering of different tasks has prime importance in task-based instruction, as authors working within this framework argue that language learning and teaching should be sequenced by means of tasks; therefore, tasks form the basis of the curriculum. Several criteria have been suggested for the sequencing of tasks. It is often argued that tasks should be arranged in an order of complexity (Long, 1985) or difficulty (Brown, Anderson, Shilcock, and Yule, 1984; Candlin, 1987; Skehan, 1996, 1998) although the precise meaning of these terms varies from one author to the other. In a recent article Robinson (2001) attempted to establish “theoretically motivated, empirically substantiable, and pedagogically feasible sequencing criteria” (p. 27). He distinguished three independent facets of tasks: task complexity, task difficulty, and task conditions. Task complexity in his interpretation is the result of various information processing demands that the structure of the task imposes on the learners; task difficulty covers learner factors: differences between learners in their cognitive and affective resources that makes certain tasks personally difficult for them, while task conditions include participation and participant factors, and the context of task performance.

Robinson (2001) argues that sequencing decisions should be solely based on task complexity, as this is a fixed and invariant feature of the task; consequently, a simple task will be less demanding than a more complex one for any given learner. Task difficulty, on the other hand, explains individual differences between learners, showing why one particular task should be more or less difficult for different learners. As differences between learners in affective variables, such as motivation, and social factors, such as group cohesion, that were shown to contribute to differences in task performance (Dörnyei and Kormos, 2000) are variable and temporal, they should form the basis of on-line methodological decisions according to Robinson. The effects of the more stable cognitive abilities such as intelligence, aptitude or even creativity could be taken into consideration as well, if conclusive results were
available about the way they affect performance on tasks. Although Robinson’s framework is primarily motivated by the aim to offer guidance regarding sequencing decisions, it also draws attention to the importance of individual variables when implementing tasks. It is quite plausible that individual differences will exert their influence on performance not only in the case of less or more complex tasks, but in the case of different task types as well.

Narrative tasks are a well-established and frequently researched task type (Bygate, 1999; Foster, and Skehan, 1996; Robinson, 1995; Skehan, and Foster, 1997, 1999). They usually involve the creation of a story in response to some kind of stimulus: a picture strip or a short film. As in most of the cases the stimuli given are purely visual and their verbal representations depend on the storyteller to a great extent, this task type seems ideal as far as the manifestation of creativity is concerned. The language output generated on oral narrative tasks is usually examined in terms of its complexity, accuracy, and fluency (Crookes, 1989, Foster, and Skehan, 1996, Skehan, and Foster, 1997, 1999). Complexity in this sense is related to the syntactic structure of language; accuracy reflects how well-controlled and target-like the forms are; while fluency gives an indication of the learner’s ability to cope with real-time communication. When comparing performance on oral narrative tasks to personal information exchange and decision-making tasks, Foster and Skehan (1996) found that language output was the most complex and least accurate in narratives. In a more recent study Skehan and Foster (1999) reported more fluent performance on tasks having clear inherent structure. Bygate (1999) argued that different task types urge learners to use a set of specific linguistic features, and described oral narrative tasks as more complex both syntactically and lexically in comparison with argumentative tasks. Robinson (1995), who studied oral narrative tasks with varying cognitive complexity, found that lexical variety (measured by the type-token ratio) and accuracy (measured by the number of error-free communication units) increase in cognitively more complex tasks.

The effect of individual variables on task performance

Only few studies have examined the effect of individual variables on the performance of communicative tasks. MacIntyre and Gardner (1994) studied the influence of anxiety on the quality of self-descriptions in L2. Their results indicated that anxious L2 learners produced shorter self-description, which were also judged to be less fluent and less complex. Dewaele and Furnham (2000) investigated how fluency, accuracy and the formality of vocabulary use were affected by extroversion. In their study extroverts were found to be more
fluent and used more colloquial words than introverts. Dörnyei and Kormos (2000) analysed how various components of motivation affected the quantity of talk students produced in an oral argumentation task. Students with positive attitude to the course and to the task to be performed spoke considerably more than those who had negative attitudes. Self-confidence and willingness to communicate in L2 were also positively related to the quantity of talk. In a recent study Kormos and Dörnyei (in preparation) found that students with positive attitude to the task produced more accurate language than those whose attitude was negative. They also established a negative relationship between anxiety and lexical richness.

The relevance of creativity for learner performance on tasks

Having reviewed the literature on creativity and tasks separately, we should now turn our attention to possible points of interaction. The relevance of creativity for learner performance on tasks can be examined on two levels. One of them is the level of specific cognitive mechanisms that are believed to contribute to creativity. Since the instrument used as a test of creativity in the study aimed at identifying divergent thinkers, it should be pointed out why we feel that divergent thinking might be advantageous for foreign language learners when tackling language tasks. The other level is the wider context of language teaching methodology, more specifically the use of communicative methods and more recently task-based instruction; in these approaches the use of drills is discouraged and emphasis is placed on conveying meaning. Despite the fact that these two levels can be considered as separate theoretically, we are aware that they interact to a great extent in practice: in most cases language learning is mediated by some kind of methodology.

On the basis of the literature review, we hypothesised that since creativity is usually manifested in production, that is, in creative products, its effects would probably be more easily detectable in output as opposed to comprehension. We believe that there are a number of reasons why language tasks, especially open-ended ones like narrative tasks, where there is no correct solution but a large number of solutions are possible, could be better suited for creative foreign language learners. Since creative learners are characterised by greater fluency, that is they provide a larger number of solutions in a given amount of time (Baer, 1993), they might be able to talk more during the tasks. As it has been suggested by Swain (1980) producing more comprehensible output has a beneficial effect on language acquisition. Flexibility, the second facet of creativity measured by divergent thinking tests, which reflects the ability to produce a wide variety of ideas (Baer, 1993), might be manifested directly in the
way language is used by the learners: if their language competence is sufficient, they might in fact use a wider range of vocabulary items in order to express their wide range of ideas. Similarly, originality, the ability to produce unusual ideas (Baer, 1993), might also prompt learners to employ a wide range of vocabulary in an attempt to give an account of the interesting ideas they have in mind. Although the above-mentioned qualities of creative people might be advantageous in any language task, we feel that narrative tasks, which obviously rely on learners’ imagination, might intensify the effect of creativity on language performance. Therefore, despite the fact that the imaginativeness or creativity of the stories themselves cannot be measured, we believed that narrative tasks would be suitable for conducting exploratory research on the effects of creativity on output.

Method

The study reported in this paper constitutes part of a larger longitudinal research project the primary aim of which was to investigate task-based learning in five Hungarian secondary school groups (see also Bygate, 1999; Dörnyei and Kormos, 2000, Dörnyei, 2002; Németh and Kormos, 2001). The data-collection phase of the project was conducted jointly with staff members from the University of Leeds and Eötvös Loránd University.

Research questions and hypotheses

The aim of our study was to investigate the effect of creativity on task-performance in oral narrative tasks. Our hypotheses were the following:
1. All the components of creativity have an effect on narrative task performance.
2. Among the measures of task-performance the quantity of talk produced, lexical variety and narrative structure are influenced by creativity.
3. Grammatical complexity and accuracy are not affected by measures of creativity.
Participants

All together 67 students from five classes in two different secondary schools participated in the project. Since the data collection took place on four different occasions, we only have full data for 35 participants due to illnesses and other reasons for absences. The students were 15-16 years old, and 20 of them were female and 15 male. The two schools that the students attended were of the same type (secondary grammar school); they provided general instruction and prepared students for further studies in higher education. The participants were all judged to be intermediate speakers of English by their classroom teachers.

Procedure

At the beginning of the project a C-test was administered to all the participants to measure their global language proficiency. The C-test used was validated for Hungarian learners of English (Dörnyei and Katona, 1992). Students completed two alternative versions of an oral narrative task with an interval of two months (see Appendix for an example of the tasks). After the completion of the tasks, students were asked to fill in a creativity test in Hungarian, which was developed by Barkóczi and Klein (cited in Barkóczi and Zétényi, 1981) and was standardised for the Hungarian adult population.

Creativity test

The standardised creativity test (Barkóczi and Zétényi, 1981) used in the study consisted of five parts, but as the first task was meant to serve as a warm-up, only the remaining four tasks were scored. There was a time limit set for each task, and the participants were not allowed to go back to previous tasks. In order to ensure that these rules were strictly kept, one of the researchers was always present while students filled in the test. The warm-up task was a sentence completion exercise, in which respondents were asked to finish sentences within three minutes. The first two tasks required verbal responses from the participants. In the task called 'unusual uses' respondents had to invent unusual uses of everyday objects such as a brick. In the 'distant associations' task (in a similar fashion to Mednick’s (1962) Remote Associates Test), students had to create associations on the basis of the common characteristics of two unrelated words (e.g.: given the words cannon and sky think of a word related to both of them but in different ways: thunder). The last two tasks were drawing tasks
(based on the Torrance Tests of Creative Thinking; Torrance, 1966). Respondents were asked to draw as many pictures as they could, starting out from the shape of a circle, and to finish abstract shapes in a creative manner. The four tasks lasted for five, six, eight and ten minutes respectively.

Tasks

The two very similar versions of an oral narrative task used in this research involved inventing a story on the basis of a picture. The task was designed by a group of experienced teachers and researchers for the purposes of this research. In order to ensure the feasibility and the appropriate level of difficulty of the tasks, the comments of the teachers who taught the students participating in the study were also taken into consideration. Students performed the tasks in the framework of their regular English classes. The tasks were presented to the students by their teachers. Students worked in pairs while performing the task; one of them played the role of the speaker and the other the role of the audience. In each case the members of the pair received different pictures. The students' task was to invent a short story based on the picture, and tell it to their partner after 5 minutes of individual planning time. The five-minute planning time was meant to give students an opportunity to plan the content of their narratives. The planning time was standardised for all the groups. Although the instructions of the tasks said that students could tell a true story as well, all the participants invented their own stories and did not choose this option.

Analysis

Measures of creativity

The scoring of the standardized creativity test was carried out in accordance with the process specified by Barkóczi and Zétényi (1981). Each item of the test was scored for three out of the four measures of creativity as defined by Baer (1993) (this creativity test does not measure elaboration), and the sub-scores were added up for the different tasks. Therefore, each of the four sub-sections of the test received three scores independently, a fluency score, a flexibility score and an originality score. The fluency score, which in this study will be called creative fluency in order to differentiate it from the temporal variable also called fluency, equalled the number of responses given, while the flexibility score reflected the number of categories the subjects selected their answers from (the categories were set up in the course of the
standardisation procedure by Barkócz and Zétényi (1981)). The originality score was assigned on the basis of a list containing an index calculated from the statistical frequency of the given response (set up in the course of the standardization procedure by Barkócz and Zétényi, 1981). Originality scores of different items varied from 0.01 to 0.99 points, while flexibility and creative fluency scores of each response were worth 1 point. The total creativity score was calculated by adding up all the creative fluency, flexibility and originality scores of the various sub-tasks. Apart from this total score, different sub-scores were also calculated: total creative fluency, the sum of the four creative fluency sub-scores; total flexibility, the sum of the four flexibility sub-scores; and total originality, the sum of the four originality sub-scores. It is easy to demonstrate that in this scoring system the creative fluency score (more precisely the number of responses the subject produces) influences both the originality and the flexibility total scores significantly. The high correlations between the fluency, originality and flexibility sub-scores are the reason why some authors (Hargreaves and Bolton, 1972) argued for dropping the originality and flexibility scores altogether since in this form they provide little additional information. We also believe that this scoring system is biased, since for example, if a person produces two highly original ideas worth the maximum score 0.99 point each, his total originality score will be 1.98 points for the given task. If, however, another student produces five statistically more common responses worth 0.50 point each, his originality score will be higher (2.5 points), than that of his/her less fluent peer, and in this way a misleading picture is gained about the two students’ true originality. Since a similar scoring method is applied for the flexibility scores (each new category is rewarded with 1 point without considering the total number or responses), they can be said to be affected by creative fluency to a great extent as well. For this reason, the establishment of creative fluency free scores was very important as these could provide information about other facets of the subjects' creativity, regardless of the number of responses they produced. In order to achieve this relative flexibility (the ratio of total flexibility and total creative fluency) and average originality (the ratio of total originality and total creative fluency) were also calculated, in line with the procedure specified in the test (Barkócz and Zétényi, 1981). This way the total creative fluency score can be used to measure creative fluency, the relative flexibility score to measure flexibility and the average originality score to measure originality as defined above.

Measures of task performance
Students’ performance on the narrative tasks was transcribed by trained research assistants and the transcripts were checked by the researchers. The texts generated by the students were examined separately, but their measures were added up. The reason for using two texts was to reduce elements of chance, such as the lack of motivation or dislike for a certain topic. Table 1 summarises the variables used in the study.

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Insert Table 1 around here
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The quantity of talk students produced was measured by the total number of words (see also Dewaele, 2000; Dewaele and Pavlenko, 2003; Dörnyei, and Kormos, 2000). In order to assess lexical diversity, we used Malvern’s and Richards’ (1997) D-formula. This formula is based on the widely used measure of lexical variety (see e.g. Robinson, 1995; 2001 in task-based research), the type-token ratio (TTR), which is the total number of different words (types) divided by the total number of words (tokens) produced. The problem with the TTR is, however, that it depends on the sample size, that is, on the number of words spoken by the participants. Richards (1987) found that the "type-token ratio falls rapidly as the number of tokens increases" (p. 205). In a recent study Jarvis (2002) argued that two formulas based on the type-token ratio: Dugast's (1980) Uber U formula and Malvern's and Richards' (1997) D-formula can be used to measure lexical richness in L2 texts in a reliable way. Both measures should, however, be used with a curve-fitting approach. Because there exists available software (VOCD available at the CHILDES web-site: http://childes.psy.cmu.edu) only for the D-formula, we applied this formula to establish a measure of lexical diversity. The calculation of the D-value is based on a mathematical probabilistic model, and the software uses random sampling of tokens in plotting the curve of TTR against increasing token size for the text to be investigated. Malvern and Richards (1997) argue that the D-value is a valid measure of diversity because it does not depend on the length of the sample, and it uses all the words produced by the participants.

Accuracy was measured by the proportion of error-free clauses relative to the total number of clauses, and grammatical complexity with the ratio of total number of clauses to the total number of AS-units. These measures have been widely used in task-based research and have proven to reflect the accuracy and grammatical complexity of students' output in a reliable manner (see Bygate, 1999; Foster, and Skehan, 1996; Skehan, and Foster, 1997). Our variables only differed from that of Bygate (1999), Foster and Skehan (1996) and Skehan and Foster (1997) that instead of c- and T-units as the unit of measurement, we applied AS-units
that seem to be better measures in the case of spoken data produced by L2 speakers (Foster et al., 2000). Foster et al. (2000) defined AS-units as "single speaker's utterance consisting of an independent clause or sub-clausal unit, together with any subordinate clause(s) associated with either" (p. 365). Foster et al. distinguish three levels of application for the use of AS-unit in analysing L2 speech. Level 1 analysis is applied for the full analysis of the data, when everything except untranscribable fragments of speech are included in the transcript. Level 2 analysis is used for highly interactional data, and at this level, one word minor utterances are excluded from the analysis. Level 3 analysis is applied when only non-fragmented, i.e., complete AS-units are analysed. In this study Level 2 analysis was used, and one word utterances such as Yes, No, Okay,Uhuh, Right and Echo responses were not included in the analysis.

Example:
AS-unit boundary is indicated with /

Student 25

A woman who lived in Europe decided to go to Africa to to uhm observe how the monkeys live there / uhm as as she arrived er there she had to to travel through the jungle / and she had a possibility to to observe the other animals how they live in in the jungle and how what they they make there / uhm and er she arrived to the farm where er she found a a lot of animal animals / and she saw the monkeys erm who live together in a in a small house uhm /- er the people who lived around this jungle er told that the monkeys er had had a had an illness…/

Our analysis of the narrative structure of the students' texts was based on Labov's (1972) classification of the elements of a narrative. According to Labov, the skeleton of any narrative consists of narrative clauses, which are temporally ordered independent clauses connected by temporal junctures. Therefore, the texts elicited by the tasks were analysed for the number of narrative clauses per AS-unit. Narrative clauses reflect the events of the story; therefore, a high percentage of such clauses can be assumed to signal complex stories as far as their event structure is concerned.

Example:
Narrative clauses are underlined and numbered
In the picture we can see two old men and they are really best friends and they had a dream for 20 30 years. They wanted to go to the Alps but they had no money. (1) But one day one of them had a chance on gambling (2) and he won a travel to the Alps for two person. (3) So they decided to go there (4) and they arrived they were happy + but eer they were very very old and by climbing a mountain (5) one of them fall fall down and (6) then he died + and so the other was so sad that he liked to + so na the they dreaming their dreams for ever and the Alps.

In the case of the analysis of narrative structure and accuracy, the texts were coded by the two researchers separately, and inter-rater reliability was found to be high (r = 0.93 for narrative structure; r = 0.95 for accuracy). For the statistical analysis SPSS (Statistical Package for Social Sciences) was used. The level of significance for this study was set at p < 0.05. The statistical analyses performed were Pearson correlations, in which we correlated the measures of task performance and creativity. Because, as will be shown in Table 2, there was considerable between-subjects variation in the learner's language performance measures, for the correlational analyses we computed standard scores for both the independent and the dependent variables. Standardised z scores express how many standard deviations above or below the mean a particular score is located. This standardised score is widely used in testing research (Hatch and Lazaraton, 1991) and also in studies on individual differences (Dörnyei and Kormos, 2000; Dörnyei, 2002; Gardner, 1985). In order to control for the effect of proficiency, partial correlations using students' C-test scores were computed.

**Results**

Table 2 summarises the descriptive statistics of the language performance measures. As can be seen in the table, there is considerable difference between the participants especially in the case of the quantity of talk produced. Students also differed greatly as regards the number of narrative clauses produced and lexical variety. Nevertheless, the distribution of none of the variables was skewed, which allowed for the use of parametric statistical procedures. The considerable between-subjects variation in the case of a number of variables was the reason for using standard scores in the subsequent correlational analyses. Table 3 contains the average originality, flexibility and total fluency scores as well as the total creativity score for the participants. In the table we also indicate the values of these variables for a larger Hungarian population investigated by Barkóczy and Zétényi (1981). It can be seen
that the average scores were somewhat higher for all of the variables in our high-school population than in the national sample. This tendency is especially striking for the total fluency and total creativity scores, where the national average was the minimum value in our sample. This can probably be explained by the fact that our participants attended grammar school, whereas the national population also includes students from vocational and vocational secondary schools.

The results of the correlational analyses are summarized in Table 4. The findings indicate that two components of creativity are associated with some measures of task performance: 1) originality, that is, the average number of original solutions students produced in the creativity test, and 2) creative fluency, that is the total number of solutions participants gave in the creativity test. No significant correlations were found between task-related variables and flexibility and the total creativity score.

A modest effect of originality can be seen in the case of measures of quantity of talk. The number of words (r = -.34; p < 0.03) is negatively correlated with the average originality score of students. In other words, students who produce a high number of original ideas in the creativity test produce short stretches of talk. A weak, but significant positive correlation was also found between creative fluency and the number of words (r = .33; p < 0.03). Lexical variety, accuracy and complexity did not correlate with any of the measures of creativity. The discourse complexity of the narrative produced was also found to be affected by originality as the number of narrative clauses per AS unit correlated positively with the average originality score (r = .34; p < 0.04).

Discussion

These findings indicate that Hypothesis 1, namely that all the components of creativity have an effect on narrative task performance, is only partially supported as flexibility was not
found to influence students' output. The results also lend only partial support to Hypothesis 2, in which we hypothesised that the quantity of talk produced, lexical variety and narrative structure are affected by originality and creative fluency. Hypothesis 3 that grammatical complexity and accuracy would not be influenced by creativity was confirmed.

In general, we can conclude that the correlations between measures of creativity and narrative task performance are not very high; approximately 10-16% of the variance in linguistic measures is related to creative fluency and originality. This shows that these components of creativity have a moderate effect on the quantity of talk and narrative structure. It is also possible that most of the variance in task performance among students is caused by motivation (Dörnyei, 2002), personality variables such as extraversion (Dewaele & Furnham, 2000), anxiety (MacIntyre and Gardner, 1994) and situational factors such as the interlocutor (Dörnyei, 2002), and among these many factors creativity contributes to the quality of task performance only to a limited extent.

The results support theories of creativity which argue that creativity is not a unitary trait, but consists of several independent components. Among these components, creative fluency, that is the ability to invent a high number of solutions in a task seems to be related only to the quantity of talk. The sum of the various components (total creativity) does not influence linguistic measures in this study. It seems that from the point of view of L2 speech production, it is rather originality, in other words, the quality of creative ideas that matters. The finding that students who produce a high number of original solutions talk less is probably related to the fact that coming up with unusual solutions requires a long period of thinking time, and results in a low number of solutions in general. In the narrative task used in this study, this manifests itself in that 'original' students produce less speech, but what they say has a complex discourse structure. In other words, the results also indicate that the complexity of narrative structure is influenced by originality as the participants of the project who invented a high number of solutions in a cognitive task, produced a high number of narrative clauses per AS unit. Narrative clauses are assumed to reflect the events of the story (Labov, 1972); therefore, it can be stated that more original students produced stories with a higher number of events than their less original counterparts.

The accuracy of task performance was not expected to be influenced by creativity as other individual variables such as extraversion were not found to be related to this measure either (Dewaele, 2000). We did not expect a relationship between complexity and creativity either as we hypothesised that grammatical complexity is mainly determined by proficiency,
even though in certain conditions some individual characteristics such as extraversion were found to affect the mean length of utterance (Dewaele, 2000).

The unexpected result of the study was that creativity did not correlate with the D-value, which is one of the most reliable measures of lexical diversity (see e.g. Jarvis, 2002; Malvern and Richards, 1997). It seems that in our sample the ability to come up with a wide variety of ideas in one's native language is not influenced by the ability to use a large array of words in a narrative task in a foreign language. Lexical variety might also be a function of language proficiency (for a review see Reid, 2000) and might rather be related to some other individual variables such as motivation (Kormos and Dörnyei, in preparation) and extraversion (Dewaele and Furnham, 1999).

These findings complement the series of studies conducted by Ehrman and her colleagues (Ehrman, 1996; Ehrman, and Oxford, 1995; Grigorenko, Sternberg, and Ehrman, 2000) who claim that the ability to cope with novelty is an important characteristic that affects the success of language learning. Their line of argumentation can be extended, and on the basis of our results, we can argue that the ability to produce original, that is, novel ideas in general, does moderately affect how students perform in a particular language learning task. The moderate effect can be due to the small sample size and to the fact that only one very specific task was used for the purposes of our study.

**CONCLUSION**

The findings of our research show that differences in creativity can account for certain differences in learners’ performance on oral narrative tasks. The most important effect of creativity manifests itself in productivity. The study also suggests that creativity is best hypothesised as a multifaceted trait as students scoring high on various components of creativity seemed to complete the same task in different ways. Students who invent a high number of solutions in a creativity test were found to engage in more talk, thus, in a foreign language setting, they might create more opportunities for themselves to use the language. The learners characterised by a higher level of originality tended to speak less and created more complex stories in terms of the narrative structure, but at the same time they might deprive themselves of the beneficial effects of more output. These results clearly indicate that besides investigating the effects of individual variables on global measures of foreign language performance, it is also possible to study their influence on specific tasks. Gathering data at this level would be desirable because information gained about the interplay of
individual differences and various aspects of task performance could contribute to pedagogical decisions during task implementation and could help the selection of language teaching and testing tasks.

It has to be pointed out, however, that in the present study aspects of creativity were found to account only for 10-15% of the variance in the students' performance. The weak correlations might be due to the small number of participants or to the more important effect of other situational, social and individual factors, therefore a follow-up study with higher number of participants would be necessary to establish with more certainty how important the role of creativity is in task performance. In addition, as one of the reviewers pointed out the relatively long planning time given to the participants (5 minutes) might have also caused that creativity did not significantly influence task performance. Thus, in future research the effect of creativity could be investigated under different planning conditions. Moreover, further studies could also explore issues that seem particularly interesting in the light of the present findings. Since it is intuitively appealing that communicative and task based methods, books, and tasks require creativity, it might be worthwhile to analyse the relationship between creativity and achievement in language learning. Another possible research direction could involve examining possible interactions of the cognitive complexity of tasks and creativity as an individual variable that contributes to task difficulty. Although in Robinson’s (2001) view, task complexity and difficulty are independent dimensions, it is also possible that for certain individual variables the two might interact. In the case of an interaction, the effects of task complexity and task difficulty could no longer be simply summed up, but they would vary depending on the level of the individual variable, such as creativity.
REFERENCES


APPENDIX

The task used in the study

Student A

Your task is to tell your partner a story about this picture. The picture can be the beginning, middle or the end of your story. This can be a true story or an imaginary one. You have five minutes to think before you start.

Student B

Please have a look at your partner’s picture and try to guess what kind of story he/she will tell you. Write down 4 adjectives or adverbs and 4 nouns that you think your partner will use. Please remember that you should not interrupt your partner while he/she is telling the story. After he/she has finished the story, discuss your guesses with your partner.

<table>
<thead>
<tr>
<th>Adjectives/adverbs</th>
<th>Nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

ACKNOWLEDGEMENTS

We are grateful to Scott Jarvis for his advice concerning lexical diversity. Thanks are also due to the anonymous reviewers for their particularly thorough and thoughtful comments.
<table>
<thead>
<tr>
<th>Measures</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measures of creativity</strong></td>
<td></td>
</tr>
<tr>
<td>Average originality</td>
<td>the ratio of total originality and total fluency scores</td>
</tr>
<tr>
<td>Relative flexibility</td>
<td>the ratio of total flexibility and total fluency scores</td>
</tr>
<tr>
<td>Total creative fluency</td>
<td>sum of responses given by the respondent on the four sub-tasks</td>
</tr>
<tr>
<td>Total creativity score</td>
<td>the sum of total originality, total flexibility and total fluency scores</td>
</tr>
<tr>
<td><strong>Quantity of talk</strong></td>
<td></td>
</tr>
<tr>
<td>Number of words</td>
<td>total number of words produced in English</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
</tr>
<tr>
<td>Number of clauses per AS-unit</td>
<td>the ratio of total number of clauses and the total number of AS-units</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
</tr>
<tr>
<td>Correct clauses per clauses</td>
<td>The ratio of grammatically correct clauses divided by the total number of clauses</td>
</tr>
<tr>
<td><strong>Lexical variety</strong></td>
<td></td>
</tr>
<tr>
<td>D-index</td>
<td>A value calculated with the help of a mathematical probabilistic model that plots the curve of type-token ratio against increasing token size</td>
</tr>
<tr>
<td><strong>Narrative structure</strong></td>
<td></td>
</tr>
<tr>
<td>Number of narrative clauses per AS-unit</td>
<td>total number temporally ordered independent clauses connected by temporal junctures (Labov, 1972) divided by the total number of AS-units</td>
</tr>
</tbody>
</table>
### Table 2. Descriptive statistics of the language performance measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quantity of talk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of words</td>
<td>35</td>
<td>46.00</td>
<td>1210.00</td>
<td>255.82</td>
<td>214.40</td>
</tr>
<tr>
<td><strong>Complexity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of clauses per AS-unit</td>
<td>35</td>
<td>1.06</td>
<td>2.25</td>
<td>1.32</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of correct clauses/words</td>
<td>35</td>
<td>0.07</td>
<td>0.91</td>
<td>0.50</td>
<td>0.21</td>
</tr>
<tr>
<td><strong>Lexical variety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-index</td>
<td>35</td>
<td>9.52</td>
<td>53.06</td>
<td>31.40</td>
<td>14.19</td>
</tr>
<tr>
<td><strong>Narrative structure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of narrative clauses per AS-unit</td>
<td>35</td>
<td>0.08</td>
<td>0.73</td>
<td>0.34</td>
<td>0.16</td>
</tr>
</tbody>
</table>
Table 3. Descriptive statistics of the creativity measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>SD</th>
<th>Hungarian population mean (N=1089)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative flexibility</td>
<td>35</td>
<td>0.46</td>
<td>0.93</td>
<td>0.77</td>
<td>0.09</td>
<td>0.73</td>
</tr>
<tr>
<td>Average originality</td>
<td>35</td>
<td>0.27</td>
<td>0.63</td>
<td>0.50</td>
<td>0.07</td>
<td>0.44</td>
</tr>
<tr>
<td>Total creative fluency</td>
<td>35</td>
<td>34</td>
<td>75</td>
<td>50.25</td>
<td>11.13</td>
<td>36.8</td>
</tr>
<tr>
<td>Total creativity</td>
<td>35</td>
<td>81.46</td>
<td>157.34</td>
<td>113.27</td>
<td>21.99</td>
<td>80.36</td>
</tr>
</tbody>
</table>
Table 4. Correlational analysis of the relationship of task-performance and creativity

<table>
<thead>
<tr>
<th>Measures of task performance</th>
<th>Relative flexibility</th>
<th>Average originality</th>
<th>Total creative fluency</th>
<th>Total creativity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity of talk</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of words</td>
<td>-0.31</td>
<td>-0.34*</td>
<td>0.33*</td>
<td>0.22</td>
</tr>
<tr>
<td>Complexity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of clauses per AS-unit</td>
<td>-0.08</td>
<td>-0.11</td>
<td>-0.07</td>
<td>-0.11</td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct clauses/clauses</td>
<td>-0.21</td>
<td>-0.22</td>
<td>-0.01</td>
<td>-0.11</td>
</tr>
<tr>
<td>Lexical variety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-index</td>
<td>-0.19</td>
<td>-0.25</td>
<td>0.04</td>
<td>-0.05</td>
</tr>
<tr>
<td>Narrative structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of narrative clauses</td>
<td>0.29</td>
<td>0.34*</td>
<td>0.02</td>
<td>0.15</td>
</tr>
</tbody>
</table>

* p < 0.05

Note: C-test scores were partialled out of the correlations