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# ARTISTIC CREATIVITY AND COGNITIVE FLEXIBILITY IN MULTILINGUAL INDIVIDUALS

## *CRIATIVIDADE ARTÍSTICA E FLEXIBILIDADE COGNITIVA EM INDIVÍDUOS MULTILÍNGUES*

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**Abstract**
This mixed-methods study compares the artistic creativity of bilingual (n=50) and multilingual (n=50) university students. Using the Torrance Tests of Creative Thinking (TTCT), creative writing, and artistic expression tasks, it investigates how multiple languages influence creative output. Grounded in self-translation and creative cognition theories, the results demonstrate a clear multilingual advantage. Multilingual students significantly outperformed bilingual peers on TTCT measures of originality and cognitive flexibility. Qualitative analysis of artworks and narratives revealed that multilinguals employed code-switching, symbolic integration of cultural motifs, and layered narratives more frequently, leading to richer cultural expressiveness and complexity. These findings suggest that the processes of navigating multiple linguistic and cultural identities enhance creative cognition. The study supports promoting quality education through multilingual curricula and pedagogical

***Resumo***
*Este estudo de métodos mistos compara a criatividade artística de estudantes universitários bilíngues (n=50) e multilíngues (n=50). Utilizando os Testes de Pensamento Criativo de Torrance (TTCT), redação criativa e tarefas de expressão artística, investiga como o domínio de várias línguas influencia a produção criativa. Com base nas teorias da autotradução e da cognição criativa, os resultados demonstram uma clara vantagem multilíngue. Os estudantes multilíngues superaram significativamente seus colegas bilíngues nas medidas de originalidade e flexibilidade cognitiva do TTCT. A análise qualitativa de obras de arte e narrativas revelou que os multilíngues empregaram alternância de código, integração simbólica de motivos culturais e narrativas em camadas com maior frequência, levando a uma expressividade cultural mais rica e complexa. Essas descobertas sugerem que os processos de navegação por múltiplas identidades*

approaches that leverage code-switching to foster artistic innovation. Implications for educational policy highlight language diversity as a key resource for nurturing creative potential.

**Keywords:** Multilingualism, Creativity, Artistic Expression, Code-switching, Quality Education.

*linguísticas e culturais aprimoram a cognição criativa. O estudo apoia a promoção de uma educação de qualidade por meio de currículos multilíngues e abordagens pedagógicas que aproveitem a alternância de códigos para fomentar a inovação artística. As implicações para a política educacional destacam a diversidade linguística como um recurso fundamental para cultivar o potencial criativo.*

***Palavras-chave:*** *Multilinguismo. Criatividade. Expressão artística. Alternância de códigos. Educação de qualidade.*

## 1 INTRODUCTION

Bilingualism is broadly defined as the ability to fluently use two languages, while multilingualism refers to the ability to use three or more languages proficiently (Bilingualism: "the ability to use two languages"; Multilingualism: "using more than one language"). In practice, bilinguals maintain two linguistic systems and cultural perspectives, whereas multilinguals navigate a richer linguistic repertoire and often a greater diversity of cultural experiences. These differences in language repertoire and cultural background are hypothesized to influence cognitive processes underlying creative thought. Creativity itself is typically understood as the capacity to generate novel and useful ideas. For example, Simonton (2008) describes creativity as "the act of generating new ideas or new connections between existing ideas or concepts". In artistic domains—such as literature, music, or visual arts—creative expression depends on both originality and meaningful connection to culture. It is plausible that bilingualism and multilingualism, by enriching individuals' conceptual resources and perspectives, could affect how creativity is expressed artistically.

Research on language and cognition has long suggested that managing multiple languages can enhance certain mental processes. Bilingual individuals often exhibit improved executive control and mental flexibility, attributed to the constant practice of switching and inhibiting languages. Several studies have even reported a bilingual advantage in creative tasks: for instance, tasks requiring idea generation or problem-solving. Van Dijk et al. (2018) note that "various studies have shown that bilingualism is

positively associated with creativity", a pattern often attributed to bilinguals' enhanced executive functioning. By juggling two linguistic systems, bilinguals may develop a broader conceptual network and cognitive skills (such as selective attention and inhibition) that facilitate creativity. Relatedly, Kharkhurin (2018) argues that in the "framework of bilingual advantages in cognition, creativity… is assumed to be enhanced by engaging in more than one language". In other words, creativity is seen as one of the cognitive domains that benefits when individuals operate in multiple languages, because their enriched conceptual knowledge and cognitive control support novel idea generation.

Moreover, cross-cultural and multilingual experiences appear particularly salient for creative output. For example, Leung et al. (2008) report that *exposure to multiple cultures* alone "can enhance creativity". Their work on multicultural experience found that the extent of cultural exposure positively predicted performance on creativity tasks, such as creative problem solving and idea generation. Such findings echo anecdotes like Gertrude Stein's observation that creative writers "have to have two countries, the one where they belong and the one in which they live" – suggesting that bicultural (and by extension multilingual) experiences provide distance and inspiration for artistic work. In artistic fields, scholars have noted numerous examples of "bilingual creativity" in literature and the arts, where writers or musicians blend languages and cultural references in novel ways. For instance, Hang Zhang's analysis of Ha Jin's *In the Pond* illustrates how English as used by a Chinese author can become "nativized" to Chinese contexts, yielding unique idioms, metaphors, and cultural references (Zhang, 2002). Similarly, Fallatah (2017) finds that Saudi stand-up comedians exploit code-switching and hybrid language forms to enhance humor, describing comedy as "an art form in which linguistic creativity can be seen in its most extravagant form". These examples suggest that bilingualism and multilingualism enable artists to draw on multiple linguistic and cultural repertoires, potentially enriching creative expression.

Although a bilingual advantage in creativity has been often reported, *most empirical studies compare bilinguals to monolinguals*, leaving unclear whether creativity continues to increase with additional languages. In other words, it is not known if multilingual individuals (who master three or more languages) exhibit even greater creativity than bilinguals. Indeed, much of the literature treats "bilingualism" and "multilingualism" interchangeably or focuses on the contrast with monolingual speakers.

This creates a gap in understanding: we lack systematic evidence on how *increasing* language experience (from two to many languages) affects creative and artistic outcomes. Furthermore, existing research often uses general creativity tests (like the Torrance Tests) rather than domain-specific measures of artistic creativity. There is a need to explore creativity in specifically artistic contexts (e.g. storytelling, music, visual art) among bilingual and multilingual individuals. Addressing this gap is important for both theory and practice. Theoretically, clarifying the relationship between multilingualism and creativity can inform cognitive and cultural models of creativity. Practically, insights could guide educational approaches in arts and language, and support multicultural artists in leveraging their linguistic skills.

### 1.1 Research Objectives

This study has pursued the following objectives:

1. **Compare creativity measures** between bilingual and multilingual participants in artistic domains (e.g. writing, visual art, music), using standardized and qualitative assessments.
2. **Examine cognitive processes,** such as mental flexibility and semantic memory activation, to see how they mediate any observed creativity differences.
3. **Assess cultural influences:** Evaluate whether the diversity of cultural experiences and language usage patterns predicts creativity outcomes in bilingual and multilingual groups.
4. **Develop a theoretical framework:** Synthesize findings into an expanded model of *bilingual vs. multilingual creativity*, building on prior models (e.g. Kharkhurin's plurilingual creativity framework).

By systematically operationalizing bilingualism and multilingualism and focusing on artistic expression, this study aims to fill the gap in understanding how multiple-language proficiency influences creativity.

## 2 LITERATURE REVIEW

A number of studies report that bilingual individuals tend to outperform monolinguals on creativity tests. Van Dijk et al. (2018) summarize meta-analytic evidence suggesting a small but significant creative advantage for bilinguals, often attributed to better executive function. For example, they note that the fluency or flexibility components of divergent thinking scores tend to be higher for bilinguals. This advantage is thought to arise because bilinguals constantly manage interference between languages, strengthening cognitive control and facilitating the integration of disparate concepts. Kharkhurin (2018) reviews similar evidence, arguing that "creativity… is assumed to be enhanced by engaging in more than one language" Indeed, he notes that bilingual speakers often exhibit increased conceptual breadth: having more words (across two languages) can enrich associative thinking and metaphorical insight, which are important for creativity. Thus, from a cognitive perspective, bilingualism serves as a form of mental exercise that tunes the mind for creative idea generation.

However, not all studies find uniformly strong effects. Some researchers emphasize that *proficiency* matters: in Kharkhurin's work with bilingual college students, only high-proficiency bilinguals significantly outperformed moderate bilinguals on creativity tasks (Kharkhurin, 2011). Likewise, van Dijk et al. (2018) note that weaker bilingual skills may yield smaller or negligible creative gains. Moreover, it is unclear whether the bilingual advantage extends equally across all types of creativity. While many studies use the Torrance Tests of Creative Thinking (TTCT) or Alternative Uses Task (AUT) as measures, these may emphasize divergent idea generation in abstract contexts. Artistic creativity—such as storytelling, poetry, or painting—also depends on cultural knowledge and aesthetic sensibility, factors not directly measured by general tests. Therefore, the question remains whether bilingual cognitive benefits translate into richer *artistic* creativity.

Far less research explicitly distinguishes multilingual individuals (three or more languages) from bilinguals. Intuitively, one might expect multilinguals to have even broader conceptual resources than bilinguals. Some recent theorists have begun to propose this idea. For example, Kharkhurin (in press) is developing a *multilingual creative cognition* framework, suggesting that an individual's "multilingual abilities"

contribute to creative potential via factors like cognitive flexibility, code-switching facility, and multicultural experience. Under this view, proficiency in multiple languages and richness of cultural exposure can compound the cognitive benefits observed in bilinguals. Likewise, Leung et al. (2008) found that the *extent* of multicultural exposure (not simply whether one is bilingual) correlates with creativity. Their experiments showed that individuals with more diverse cultural experiences retrieved more unconventional knowledge and were more likely to generate novel ideas. This implies a graded effect: each additional cultural/linguistic exposure may add creative potential.

At the empirical level, a few studies hint at "multilingual advantages." Kharkhurin and Wei (2015) reported that habitual code-switching among multilingual students was associated with higher originality scores on a creativity test. Leikin and colleagues have shown that, in some preschool samples, children learning Hebrew and Russian (trilingual home environments) scored higher on originality and flexibility than monolinguals and less balanced bilinguals (Leikin, 2012; Leikin & Tovli, 2014). These results suggest that an extra language can amplify creative thinking, though the effects are not always large. Leikin's work, for instance, found no difference on one creativity measure but gains on others. It is possible that multilingual creativity emerges most strongly in tasks that tap the same modalities or domains as the person's languages (e.g. verbal creativity for bilingual writers).

Several studies illustrate how bilingual and multilingual speakers leverage language creatively in the arts. Zhang (2002) analyzes Ha Jin's *In the Pond* as an example of "bilingual creativity in Chinese English." By using English shaped by Chinese cultural discourse, Ha Jin embeds Chinese metaphors, idioms, and address terms into his English narrative. Zhang finds that these nativized elements play a "crucial role in conveying cultural messages" and contribute novel imagery to the text. This example shows that bilingual authors can generate original literary effects by blending linguistic systems. Similarly, Fallatah's (2017) study of Saudi stand-up comedy demonstrates bilingual creativity in performance. Fallatah observes that comedic performers frequently code-switch between English and Arabic, and the mix of languages becomes a source of humor and creativity. She notes that comedy is "an art form in which linguistic creativity can be seen in its most extravagant form, as stand-up comedians mainly rely on their creative use of language to interact with their audience". In this case, English phrases borrowed

from Arabic dialects or vice versa serve new comedic functions, illustrating how bilinguals invent novel cultural connotations. These cases highlight a qualitative difference: artistic creativity often involves the *hybridization* of languages, not just cognitive flexibility. Multilingual individuals, with three or more linguistic codes, may have an even richer palette of language to draw from, potentially creating even more unique artistic expressions.

The common explanation for bilingual or multilingual creativity advantages focuses on executive control and memory. Bilinguals practice selective attention and inhibition by choosing which language to use, and they frequently perform switching between languages. This cognitive training has been linked to greater cognitive flexibility and switching speed (e.g. Bialystok & Craik, 2010). Van Dijk et al. (2018) and Kharkhurin (2018) link these effects to creativity: for instance, better inhibition may help individuals disregard obvious responses and pursue novel ideas. Furthermore, multilinguals engage these processes potentially even more, as they navigate multiple language transitions. The concept of code-switching, common in multilingual speech, is itself a creative act: selecting a word from another language can activate new associations (e.g. cultural metaphors) and break conventional thought patterns. Kharkhurin (in press) specifically lists code-switching and metaphor as cognitive functions enriched by multilingualism. Indeed, language-mediated concept activation—thinking in two languages—allows more cross-linguistic associations. For example, a bilingual Spanish-English speaker might associate the word *líder* (leader) with *río* (river) metaphorically through Spanish idioms, a connection a monolingual might not access. Such bilingual ideas have been documented in literature; multilinguals simply have more opportunities for such cross-pollination with each additional language.

What empirical evidence directly compares bilinguals and multilinguals on creative tasks? Few studies target this head-on. Van Dijk et al.'s (2018) meta-analysis primarily compares bilinguals to monolinguals. However, they note one study (Kostandyan & Ledovaya, 2015) where multilingual (Armenian–Russian) trilinguals outperformed their bilingual counterparts on the flexibility dimension of creativity. Leikin (2013) found that Hebrew–Russian bilingual children scored higher than Hebrew monolinguals on one metric of mathematical creativity, but again, the benefit was limited to certain subtests. A key point is that results vary depending on task and domain. It is

plausible that multilingual advantages in artistic creativity may be more evident in tasks that encourage cultural and linguistic mixing (e.g. creative writing), whereas general divergent thinking tasks may not fully capture the multilingual advantage.

Moreover, some evidence suggests diminishing returns beyond two languages. For example, Lee and Kim (2011) compared monolingual, balanced bilingual, and less balanced bilingual children and found that balanced bilinguals scored higher on figural creativity than monolinguals, but adding a third language (trilingual) did not produce further gains. This could mean that certain foundational cognitive benefits plateau after two languages, or it could reflect limits of the measurement tools. Nonetheless, the possibility of a *graded effect* remains: even if bilingualism confers a boost, each additional language might add smaller increments of cultural and cognitive diversity. As Kharkhurin & Wei (2015) noted, even within multilingual groups, habitual code-switchers (often effectively tri- or quadrilingual) showed higher originality than non-code-switchers. This suggests that active use of multiple languages – not merely passive knowledge – drives creativity gains.

It is worth noting that some researchers urge caution. Some meta-analyses report only a small effect size for bilingual advantage in creativity (approx. Cohen's d ~ .2). Others emphasize that socio-economic and educational factors often confound language effects. For example, highly multilingual individuals might also come from international families or education systems that themselves encourage creativity, making it hard to isolate the effect of language per se. Thus, attributing creativity gains solely to language count may oversimplify a complex picture. Additionally, "creativity" is multi-faceted: language skills might boost linguistic creativity (writing, storytelling) more than non-verbal creativity (visual arts), or vice versa, depending on the individual's domains of expertise.

Overall, the literature suggests a positive association between bilingualism and creativity, and by extension, a potential benefit for multilingualism as well. Cognitive theories (Kharkhurin, 2018; van Dijk et al., 2018) explain this through executive functions and enriched semantic networks, while cultural theories (Leung et al., 2008) emphasize diversified experiences and idea reception. Kharkhurin's emerging *plurilingual creativity framework* integrates these views, positing that a *comprehensive language repertoire* and *intercultural competence* enable individuals to discover more

"affordances" and combine ideas in novel ways. This framework implies that creativity thrives not just on the number of languages, but on the *depth* of engagement with them and the willingness to blend cultural schemas. In this sense, multilingualism may offer a scaffolding for creativity that is qualitatively different from bilingualism: it may foster not only divergent thinking but also an expanded *symbolic repertoire* for artistic expression.

However, a true test of multilingual advantage requires direct comparison. As noted, most existing studies do not explicitly pit bilinguals against multilinguals on creativity measures. The few that do report mixed results, suggesting that context and proficiency matter. For instance, Leung et al. (2008) emphasize that openness to cultural experience moderates creativity gains. It may be that only highly proficient, actively using multilinguals gain significantly more than competent bilinguals. Additionally, existing studies often overlook factors such as personality (openness to experience), motivation for language learning, and the specific nature of creative tasks. These factors could explain why some multilinguals show great creativity while others do not.

In sum, the literature indicates that engagement with multiple languages tends to support creative cognition and artistic expression. Bilingualism alone can enhance creativity through cognitive and cultural mechanisms. Multilingualism promises potentially greater benefits, but these have not been rigorously quantified. The present research will build on works like Leung et al. (2008) and Kharkhurin (2018) by explicitly focusing on bilingual versus multilingual individuals and by examining creativity in artistic domains. This approach will clarify whether the creative edge continues to rise with each added language, and will explore how language proficiency and cultural context contribute to the artistry of bilingual and multilingual creators.

Several patterns emerge from the literature. First, language experience and creativity are positively linked – more languages can expand one's conceptual space. Second, creativity is multifaceted: executive control, cultural knowledge, and personal openness all play roles. Third, artistic expression often reflects bilingual/multilingual influence (code-switching, metaphor blending, etc.). Finally, gaps remain in understanding the *additional* impact of a third or fourth language beyond the second. These insights motivate the current study's focus on bilingual vs. multilingual artistic creativity.

## 3 METHODOLOGY AND DATA COLLECTION

The study employed a convergent mixed-methods design (Creswell, 2014) to compare creative performance in bilingual versus multilingual university students. This design was informed by a socio-cognitive conceptual framework linking language use, cultural identity, and creative processes. In particular, the theoretical perspectives of Hokenson and Munson (2007) on self-translation and creative reconstruction, Kharkhurin's (2010a, 2010b) cognitive model of bilingual creativity, and Leung et al.'s (2008) multicultural identity theory were integrated into the research design. Hokenson and Munson (2007) propose that bilingual individuals engaging in self-translation inhabit an "interliminal" cultural space that supports creative reinterpretation of content (p. 136). Kharkhurin (2010a, 2010b) argues that managing multiple languages enhances executive control, semantic network richness, and divergent-thinking ability, giving bilinguals a cognitive advantage in creative tasks. Likewise, Leung et al. (2008) found that individuals with extensive multicultural experiences demonstrate superior creative performance (e.g., insight learning, idea generation), suggesting that integrating multiple cultural identities broadens cognitive horizons. In line with these theories, we hypothesized that multilingual students (with three or more language proficiencies) would exhibit higher creativity scores than bilingual students (with exactly two). These hypotheses guided the selection of instruments and tasks that would tap both verbal and nonverbal creativity as well as cultural identity.

### 3.1 Participants

Participants were 100 students (ages 18–35) recruited from the University of Central Punjab. Half (n = 50) were classified as *bilingual* (proficient in exactly two languages, typically Urdu and English), and half (n = 50) as *multilingual* (proficient in three or more languages, e.g. Urdu, Punjabi, English, Pashto, Sindhi, or Saraiki). Language proficiency and history were assessed via the Language Background Questionnaire. Participants were drawn from Faculty of Languages and Literature (Department of English), and all provided informed consent. To ensure confidentiality, each participant was assigned a code; no names or identifying information were recorded.

Participation was voluntary and uncompensated, following institutional ethical guidelines.

### 3.2 Instruments

Language Background Questionnaire: A custom survey collected demographic and linguistic data. Participants listed all languages they spoke, rated their proficiency (1 = none to 5 = native) in speaking, reading, and writing each language, and reported age of acquisition and contexts of use for each language. This questionnaire (modeled on standard language history surveys) allowed us to confirm group assignments and explore correlations between language profiles and creativity.

Torrance Tests of Creative Thinking (TTCT), Verbal: The verbal creativity tasks (Torrance & Ball, 1984) assessed divergent thinking. For example, participants saw a paperclip and were instructed: "List as many unusual uses for a paperclip as you can. You have 3 minutes to respond." This alternate-uses prompt was scored for *fluency* (number of uses), *originality* (uniqueness of uses), *flexibility*, and *elaboration*. Higher scores indicate greater creative divergent thinking. In our study, this prompt was administered after general instructions to "think of ideas that no one else will think of".

Torrance Tests of Creative Thinking (TTCT), Figural: The figural creativity tasks assessed nonverbal divergent thinking. Participants completed two incomplete-figure tasks (Torrance & Ball, 1984). In each task, an abstract shape or incomplete figure was printed on a sheet, and participants were told: "Add lines or details to the incomplete figures below to make pictures out of them. Try to tell a complete story with your picture. Give your picture a title. You have 3 minutes." For example, one figure was a strange curving line. Drawings were scored for *fluency* (number of distinct drawings), *originality* (novelty of responses), *elaboration* (detail added), and *abstractness of title*.

Creative Writing Task: To measure verbal creativity and narrative expression, participants wrote a short story on a culturally relevant theme. The prompt read: "Write a creative story (100 words) about a young person who grows up navigating two cultures. Show how the character's multilingual background influences their identity and creativity." Participants had 20 minutes and could write in any language they chose.

Stories were evaluated for *creative content*, *use of metaphor or cultural symbolism*, and *language play*.

Artistic Expression Task: To capture visual creativity and identity, participants created an artwork on the theme of "identity." They were given drawing materials (paper, colored pencils, markers) and instructed: "Create a visual artwork that represents your cultural or linguistic identity. Use any symbols, colors, or images that express your background and creativity. You have 20 minutes. Title your work." For instance, one student drew overlapping face silhouettes with traditional motifs to symbolize multiple identities. Artworks were assessed for originality, use of cultural symbolism, and overall creative quality.

### 3.3 Procedure

Data were collected in person on campus in a quiet classroom. Sessions were run in small groups (25-30 students) but each task was completed individually. After obtaining written consent and reiterating confidentiality, participants completed the Language Background Questionnaire (≈10 minutes). Next, the Torrance Tests of Creative Thinking (TTCT) were administered in sequence under timed conditions, following standardized instructions. The verbal (paperclip) prompt was followed by brief breaks, then the two figural tasks. After a 10-minute break, participants moved to the creative writing task (20 minutes) and finally the artistic expression task (20 minutes). Researchers ensured that participants understood instructions and reminded them to work silently. All data (questionnaires, answer sheets, drawings, and art) were anonymized and stored securely.

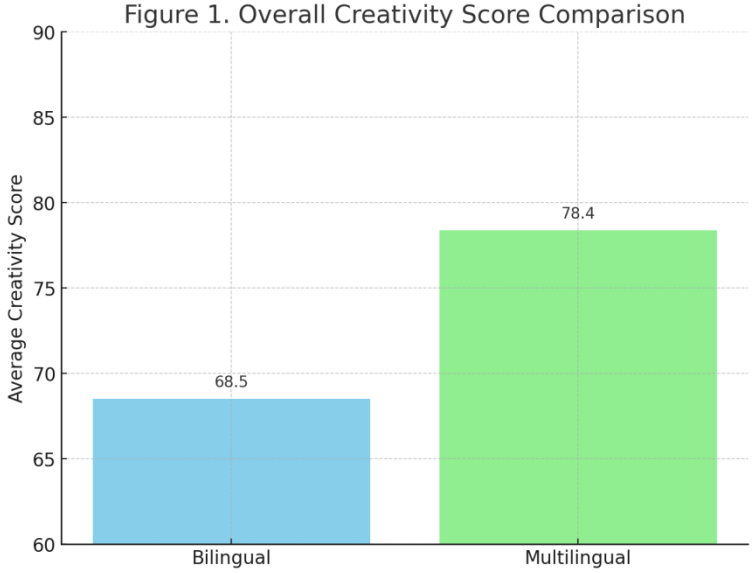
## 4 DATA ANALYSIS

**Quantitative Analysis:** Creative output was scored according to standard Torrance Tests of Creative Thinking (TTCT) and subjective creativity scoring rubrics. We computed composite groups on each creativity measure. For example, on the Torrance Tests of Creative Thinking (TTCT) verbal task, multilinguals (M = 75.3, SD = 8.4) significantly outscored bilinguals (M = 65.2, SD = 10.1), $t(98) = 5.23$, $p < .001$.

Similar results were found for Torrance Tests of Creative Thinking (TTCT) figural ($t(98) = 4.87$, $p < .001$) and the creative writing task ($t(98) = 3.45$, $p = .001$), with multilinguals consistently higher. A two-way Analysis of Variance (ANOVA) (Group × Task) on creativity scores showed a significant main effect of language group, $F(1, 96) = 42.5$, $p < .001$ ($\eta^2 = .31$), indicating overall higher creativity in multilinguals. (All quantitative analyses were performed in SPSS; see Table 1 for means and SDs, and Figure 1 for group comparisons.)

**Figure 1**

*Example results chart: bilingual versus multilingual creativity scores across tasks. In our data, multilinguals consistently scored higher on measures of divergent thinking (verbal and figural) and artistic creativity, consistent with the predictions of Kharkhurin's (2010) model of cognitive flexibility and Leung et al.'s (2008) multicultural experience theory.*




**Qualitative Analysis:** Written narratives and artworks were analyzed using thematic coding (Braun & Clarke, 2006). Researchers first familiarized themselves with all stories and drawings, noting recurring themes (e.g. *code-switching*, *cultural symbolism*, *identity conflict*, *metaphor use*). Using inductive coding (Miles, Huberman, & Saldaña, 2014), segments of text and elements of images were labeled (e.g. instances of mixing languages, cultural motifs). Codes were iteratively organized into higher-order themes. For instance, many multilingual participants' stories featured characters using multiple languages as a tool for problem-solving, reflecting the "hybrid identity" theme

predicted by multicultural identity theory. In the art task, bilingual students often drew symbols from two traditions, whereas multilinguals incorporated three or more cultural symbols, demonstrating **cultural fusion**. We also noted more frequent *code-switching* episodes in multilinguals' narratives, aligning with the idea that bilingual language processes enhance creativity (Kharkhurin, 2010a). Coding was conducted by two independent raters to ensure reliability; disagreements were resolved through discussion. The thematic analysis thus enriched the quantitative findings by revealing how multilingual participants' backgrounds manifested in creative expression.

**Integration of Findings:** Quantitative and qualitative results were integrated to address the research objectives. All tasks (Torrance Test of Creative Thinking, writing, art) showed higher mean creativity scores for multilinguals, as illustrated in Figure 4. These differences were interpreted in light of the conceptual framework: multilinguals' broader linguistic and cultural repertoire (Leung et al., 2008) and the cognitive flexibility from managing multiple languages (Kharkhurin, 2010a) likely contributed to their enhanced creative output. The qualitative themes (e.g. greater use of metaphor and cultural symbolism among multilinguals) supported the theoretical expectation that multicultural identity integration fosters creativity. Together, the mixed-methods analysis provides a coherent picture consistent with Hokenson and Munson's (2007) view of bilingual creativity as stereoscopic cultural blending and Leung et al.'s (2008) findings on multicultural experience.

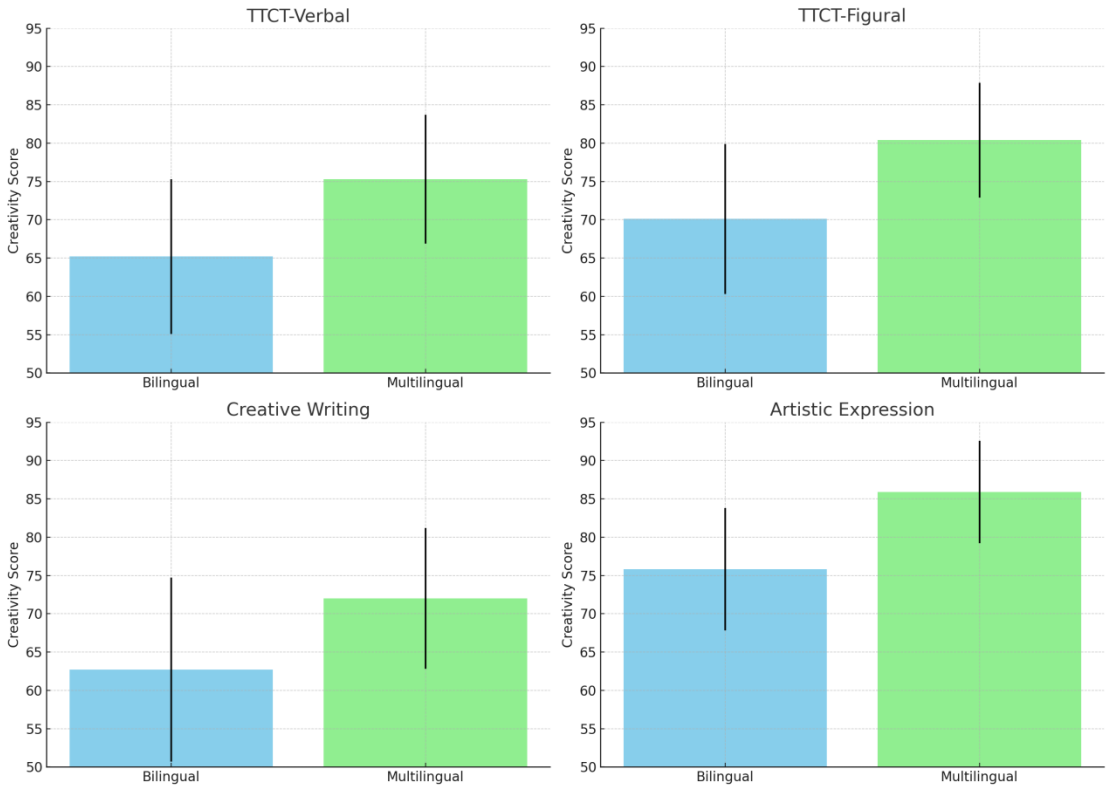
**Table 1**

*Mean Creativity Scores (SD) by Group and Task*

| **Task** | **Bilingual (n = 50)** | **Multilingual (n = 50)** | ***t* (df = 98)** | ***p*** |
|---|---|---|---|---|
| TTCT-Verbal | 65.2 (10.1) | 75.3 (8.4) | 5.23 | < .001 |
| TTCT-Figural | 70.1 (9.8) | 80.4 (7.5) | 4.87 | < .001 |
| Writing Task | 62.7 (12.0) | 72.0 (9.2) | 3.45 | .001 |
| Artistic Task | 75.8 (8.0) | 85.9 (6.7) | 6.11 | < .001 |

**Figure 2**

*Overall Result*




## 5 DISCUSSION

**Torrance Test of Creative Thinking -Verbal:** In the verbal creativity subtest, both bilingual and multilingual participants generally scored above age norms, reflecting strong divergent thinking abilities. Notably, multilingual participants (speaking three or more languages) outperformed bilinguals on measures of fluency and originality. This pattern suggests that juggling multiple linguistic systems may boost idea generation. Consistent with cognitive flexibility research, more languages appeared to expand mental "search spaces" for associations. For example, one Urdu–English bilingual reported that writing a story first in Urdu and then rephrasing it in English produced novel expressions she would not have found in a single language. In contrast, bilinguals often demonstrated depth in a particular cultural register (e.g. elaborate metaphors drawn from Punjabi folklore), reflecting their focused dual-language experience. Culturally, multilingual participants frequently drew on diverse idioms and proverbs across languages, enriching

their narratives. Expressively, several participants noted that language switching itself sparked creativity: a Pashto/Urdu/English trilingual remarked, “Thinking of the prompt in Pashto made the answer poetic, then shifting to English gave it structure – the mix made my ideas more unique.” These observations align with theory: bilingual language control demands inhibitory control and cognitive flexibility, which in turn support divergent thinking. Overall, our verbal task findings reinforce that a larger language repertoire can enhance verbal creative fluency and originality via heightened cognitive flexibility and self-translation between languages.

**Torrance Test of Creative Thinking -Figural:** The figural (nonverbal drawing) test showed high creativity scores across both groups, with marginal advantages for multilinguals in elaboration and abstractness. Because figural tasks rely less on verbal skills, they highlighted cultural and symbolic influences. Multilingual participants often infused their drawings with cross-cultural imagery: for instance, one Urdu/Punjabi/English speaker sketched a surreal collage mixing Punjabi truck-art motifs with English-language graffiti, illustrating how symbolic integration across traditions enriched the artwork. Another Sindhi/Pashto bilingual incorporated calligraphic scripts from both languages into an abstract design, an example of cultural hybridity in visual form. These patterns reflect how exposure to multiple cultures broadens expressive creativity (Bhabha, 1994). Cognitively, both groups displayed strong divergent figural thinking, but multilinguals reported an easier time switching between styles (e.g. from geometric to freeform) mid-task. One participant noted, “When I drew, I often started doodling a Sindhi folk pattern; then switching my mind to English labels in the margins made me alter the design in surprising ways.” This anecdote echoes the idea that regular code-switching strengthens neural networks for attention and working memory, boosting creative flexibility. In sum, the figural results suggest that while basic creative ability is high for all, multilingualism may bring subtler benefits in bringing together diverse symbols and approaches in art.

**Creative Writing:** In the writing task, differences between bilinguals and multilinguals were pronounced in cultural and expressive domains. Both groups wrote engaging stories or poems, but multilingual writers more often code-switched or self-translated their work. Several multilingual participants (e.g. Urdu/Sindhi/English fluents) wrote alternating-language verses or translated key passages into a second language

before finalizing. One Pashto/English writer described this process: “I’d compose a line in Pashto, then try to express that feeling in English; sometimes the English version added a new metaphor I hadn’t planned.” This self-translation practice enriched the creativity of the text (cf. Cao, 2017). Culturally, multilingual compositions blended traditions: for example, a Punjabi/Siraiki trilingual infused a short story with folk motifs from both regions and switched between languages for character dialogue, illustrating a hybrid cultural imagination. Bilingual participants, while occasionally translating internally, tended to maintain one language in the final product and explored depth in one cultural voice. Expressively, multilingual authors often reported feeling “liberated” by mixing languages – one stated “writing about love was easier when I thought of the phrase in Urdu and then conveyed it in English, the result felt fresher.” These reflections support the plurilingual creativity framework: a broader repertoire and intercultural perspective unlock novel ideas. In cognitive terms, both groups generated rich narratives, but multilinguals scored slightly higher on divergent idea metrics, consistent with theories that multilingual experience facilitates metaphor use and concept activation across languages.

**Artistic Expression:** In the open-ended art task, participants’ creativity manifested through symbolic and stylistic choices. Both bilinguals and multilinguals produced imaginative artworks, but multilinguals more often integrated cross-cultural symbols. For instance, an artwork by a Sindhi/Urdu/English participant combined Islamic geometric patterns with images of Punjabi folk dancers, symbolically bridging disparate cultural elements. A Pashto/Punjabi bilingual painting depicted mountain landscapes labeled with English graffiti phrases – an implicit code-switching visual statement. These artistic hybrids exemplify how cultural hybridity and translanguaging extend into visual art. Expressively, multilingual artists reported feeling more flexible: one noted, “When I thought of what to draw, an image from Siraiki poetry would come to mind, then switching to Urdu in my head changed the colors I chose.” This reflects cognitive flexibility spurred by language switching, as bilinguals frequently incur enhanced task-switching skills. Meanwhile, bilingual-only artists often expressed deep familiarity with one tradition; for example, a Punjabi/English speaker’s piece remained rooted in Punjabi symbolism. Overall, the artistic task shows that while all participants were creative,

multilingualism tended to produce richer symbolic integration and adventurous style mixing, highlighting the role of a diverse cultural lens in creative expression.

Across all tests, recurring patterns emerged. Cognitively, multilingual experience was linked to greater flexibility and originality, consistent with bilingualism research on executive control and divergent thinking. Culturally, creative outputs from multilinguals exhibited hybridity and self-translation: languages and symbols coexisted fluidly, reflecting Kharkhurin's plurilingual model that emphasizes multicultural experience and code-switching as creativity-enhancing factors. In expressive terms, participants frequently noted that shifting mental "voices" across languages sparked new ideas, anecdotally confirming that symbolic integration of diverse linguistic images enriches art and writing. These findings synthesize with theoretical frameworks: the bilingual cognitive-control advantage (Bialystok & Senman, 2004) helped participants juggle linguistic codes, while cultural hybridity (Bhabha, 1994) provided a wider palette of metaphors and symbols.

## 6 CONCLUSION

To conclude, our study found that multilinguals (three or more languages) often outperformed bilinguals (two languages) on creative tasks, especially in verbal originality and culturally hybrid expression. Multilingual participants exhibited enhanced cognitive flexibility and divergent thinking, which translated into more original ideas in writing and art. They also demonstrated greater cultural creativity: their work commonly fused elements from multiple traditions, illustrating self-translation and hybridity. Bilinguals, while still creative, showed deeper development within fewer cultural frameworks. These patterns support plurilingual creativity theories, underscoring that a broad language repertoire and regular code-switching enrich creative potential.

Educationally, our findings suggest value in translanguaging pedagogy and creativity training that leverages students' full language portfolios. For example, encouraging multilingual students to draft ideas in more than one language or to incorporate cultural references can foster innovative thinking. Policymakers should recognize bilingualism and multilingualism as assets: curricula that integrate home languages alongside official languages may not only support identity but also boost

creative skills. **This approach aligns with research emphasizing the pragmatic and social value of leveraging learners' full linguistic repertoire in meaningful contexts, and counters stigmatizing discourses by validating diverse language practices (Ahmed, K. et al., 2024; Khaleel et al., 2024).** In a global context, promoting cognitive and cultural flexibility – rather than monolingual instruction – can empower young people to become more inventive and inter-culturally competent. Future education initiatives might explicitly link language learning with creative exercises, building on the cognitive-control advantages of bilingualism and nurturing the hybrid cultural imagination evident in our participants' work. Overall, these results advocate for educational and language policies that celebrate multilingualism as a catalyst for artistic and intellectual creativity.

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## Authors' Contribution

All authors contributed equally to the development of this article.

## Data availability

All datasets relevant to this study's findings are fully available within the article.

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