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# The Impact of Language-Induced Cultural Mindset on Originality in Idea Generation

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Creativity is vital in the contemporary business world. Drawing on the culture-as-situated-cognition theory, we investigate how language affects divergent thinking. We study multicultural bilinguals (Arabs in Israel) whose two languages reflect contrasting cultural mindsets: individualism (Hebrew) versus collectivism (Arabic). Theoretically, individualism is associated with novel thinking as it encourages autonomy of thought and action, whereas collectivism encourages compliance to social norms. We investigate the impact of language as a factor that may affect performance in divergent thinking tasks through its associated cultural mindset, distinguishing this from the effects of the speaker's proficiency in the language. We expected that individualism induced by language (in this case, Hebrew) would promote greater originality in tasks demanding high, but not moderate, levels of ingenuity. Study 1 ( $N = 163$ ) induced competing cultural mindsets using two cultural primes—language and task instructions—in a divergent thinking task. As hypothesized, Hebrew was associated with greater originality (uniqueness of ideas) but not fluency (number of ideas); and this pattern is specific to language, not the cultural prime induced by task instructions. Study 2 ( $N = 137$ ) confirmed that the effect is stronger in tasks calling for greater ingenuity. Implications for language management in organizations are discussed.

## Public Significance Statement

Creativity is an important skill for individuals and organizations. Many external factors impact creativity, among them cultural individualism. We expect individualism to amplify novel and original thinking. Using language as a cultural cue, we study Arab students proficient in Arabic and Hebrew and show that, despite being more fluent in Arabic (their mother tongue), they display greater originality in Hebrew (a language associated with individualistic values). This research shows that language is much more than words and sentences; it carries the essence of a culture and impacts performance.

**Keywords:** cultural mindset, individualism versus collectivism, creativity, divergent thinking, multiculturals

**Supplemental materials:** <https://doi.org/10.1037/xap0000437.supp>

Human workers in the future will need to be creative to fully realize the benefits of all the new things for the future—new products, ways of working and technologies. Robots currently can't compete with humans on creativity. The future workplace is going to demand new ways of thinking, and human creativity is the key to it.

—Bernard Marr, *Forbes*, 2019

Creativity is defined as the generation of novel and useful ideas that make a meaningful contribution to resolving a problem or meeting a need (Amabile, 1983; Guilford, 1950). In the contemporary business world, creativity is considered a critical virtue, essential to organizational and personal success, an ability that can grant firms and entrepreneurs sustained competitive advantage as they

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Initial findings of Study 2 were presented in the Annual meeting of Academy of Management in August 2015 as part of a symposium on multicultural employees; and in a local conference in Israel (Israel

Organizational Behavior Conference) in January 2016. The research materials, data files, and the syntax files are available at <https://osf.io/sdfvg>. The studies reported in this article were not preregistered.

Sharon Arieli is responsible for the conceptualization of overarching research goals, the development of the studies, and the management of the data collection. She also wrote the initial draft of the article. Sari Mentser is responsible for data analyses, and supported the first author in conceptualizing research goals, designing the studies, and collecting data. She also critically reviewed and edited initial drafts of the article.

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seek to cope with the current avalanche of new products, technologies, and work settings (Cheng et al., 2008; Miron et al., 2004; World Economic Forum, 2016). More importantly, creativity is a human capacity that is still missing in robots, making humans' contribution unique and unreplaceable. As a result, organizations constantly strive to improve their ability to perform and react creatively by identifying factors that amplify or hinder creativity in employees and teams.

With rising globalization, more and more attention is being given to culture as an environmental factor that may influence creative performance (Anderson et al., 2004; Erez & Nouri, 2010; Mok & Morris, 2010; Zhou & Su, 2010). Culture is conveyed through multiple channels, of which one important path is language and communication. Research speaks to the emergence of linguistic diversity as one of the major challenges facing national as well as multinational companies (Yanaprasart, 2016). Language management plays an important role in organizational coordination and consequently influences organizational functioning, success, and the likelihood of gaining a competitive advantage (Feely & Harzing, 2003). Language is much more than words and sentences; it carries the essence of a culture (Kay & Kempton, 1984).

We focus on the impact of individualism versus collectivism—a cultural dimension that is theoretically associated with creativity. Drawing on the culture-as-situated-cognition (CASC) theory (Oyserman, 2011, 2017), the current research is the first to experimentally study how creativity is affected by the cultural mindset induced by language. Language is an unobtrusive, holistic, and comprehensive prime for culture. We unfold some of the complexity inherent in language management by examining a population of multicultural, bilingual individuals whose two languages reflect contrasting cultural mindsets in terms of individualism versus collectivism. Specifically, our population comprises Arabs in Israel who speak Arabic (a language associated with a culturally collectivist mindset; Arieli & Sagiv, 2018) as their mother tongue, but who can also communicate fluently in Hebrew (a language associated with an individualist mindset; Arieli & Sagiv, 2018).

We start by reviewing research on culture and creativity and discussing association between individualism versus collectivism and creativity. We then present the CASC theory and the promise of employing language as a cultural prime. Finally, we formulate the hypotheses for two studies.

### Culture and Creativity

Culture is built on recurring events, situations, and experiences that provide group members with opportunities, constraints, and expectations that, in turn, form their values, systems of meaning, and patterns of thinking (see review in Gelfand et al., 2007; Oyserman, 2017). One way to distinguish between cultures is by identifying their predominant cultural values. Cultural values address issues that confront all societies and represent the way the physical and social environments are captured and understood by a specific cultural group (Schwartz, 1999; Triandis, 2001).

One of the most prominent value dimensions that interests researchers and organizations concerns the relationships and boundaries formed between the individual and the group. At the societal or cultural level, this dimension distinguishes individualistic cultures, which view individuals as independent entities who are encouraged to forge their own way in life, from collectivistic cultures, which view individuals as integral parts of the group and expect them to find

meaning in life through sharing and striving toward the group's goals (Hofstede, 1980; Schwartz, 1999; Triandis, 1995). Individualism reflects the motivation to express autonomy of thought and actions and is theoretically associated with creativity and novel thinking. In contrast, collectivism reflects the motivation to preserve the status quo and is thus considered as a barrier to creativity (Goncalo & Staw, 2006; Hennessey & Amabile, 2010; Hofstede, 1980; Schwartz, 1999).

Most research on culture and creativity has compared the creative performance of individuals from different nations, focusing mainly on Western versus East Asian societies (Zhou & Su, 2010). Researchers have argued that Westerners are likely to be more creative than East Asians because Western cultures socialize their members to think in an individualistic manner, demonstrating their originality and uniqueness (Fiske et al., 1998; Niu & Sternberg, 2001; Zhou & Su, 2010). In contrast, East Asian cultures are considered more collectivistic, placing higher importance on conformity and adherence to norms. However, empirical findings have been inconsistent, revealing a more complex picture. Some studies have indeed reported that Westerners (mainly Americans) outperform East Asians in measures of creativity (e.g., Jaquish & Ripple, 1984–1985; Niu et al., 2007; Niu & Sternberg, 2001; Saeki et al., 2001; Wong & Niu, 2013; Yi et al., 2013; Zha et al., 2006). Others have shown the opposite pattern (e.g., Chan et al., 2001; Rudowicz et al., 1995; Torrance & Sato, 1979), and still others have found no significant cross-cultural differences at all (e.g., Chen et al., 2002; Niu & Sternberg, 2002; Nouri et al., 2014; Riquelme, 2002; Saeki et al., 2001). Thus, further research is needed in order to reveal the influence of individualism versus collectivism on creativity and novel thinking. In this research, we take a situated approach to culture using language as a cultural prime among multicultural bilinguals.

### Culture-as-Situated-Cognition Theory

CASC theory builds on the understanding that cultures are not strictly individualistic or collectivistic, but rather encompass elements of both sets of values, taking into account both the interests of the group and the personal interests of their members (e.g., Oyserman, 2017; Schwartz, 1999; Triandis, 1995). Through their life experiences, members of a cultural group gain the cultural knowledge needed to navigate in society and are exposed to both individualistic and collectivistic cues and instantiations. Consequently, they forge both individualistic and collectivistic mindsets and can shift between them according to the situation (Oyserman, 2017). In other words, individuals are sensitive to the immediate cultural cues that are salient in a given situation and are likely to assume a congruent cultural mindset when they interpret the situation or when they are expected to react, perform, or make a decision.

Cultural mindset is defined as a cognitive schema involving goals (why to act), content (mental knowledge about the self), and procedures (how to think and act) that reflect a specific cultural orientation (Oyserman, 2011, 2017; Oyserman et al., 2009). To better understand the associations between individualism versus collectivism and creativity, we theoretically analyze each cultural mindset. The individualistic mindset consists of goals, content, and procedures relevant to independence, uniqueness, and separation, whereas the collectivistic mindset consists of goals, content, and procedures relevant to interdependence, assimilation, conformity, and connection (Oyserman, 2017; Oyserman & Lee, 2008). Thus, for example, we can expect someone assuming an individualistic mindset to be motivated by

goals highlighting self-direction and free choice (vs. conformity and obedience); to prefer semantic content emphasizing novelty and originality (vs. traditional solutions and norm-adherence); and to perform better under procedures focusing on independent objects (vs. contextual relationships between objects).

Cultural primes have been used to study cultural differences related to individualism versus collectivism across a range of outcomes. These include both self-perceptions and beliefs, such as self-construal as independent versus interdependent (e.g., Gardner et al., 1999; Goncalo & Kim, 2010; Lee et al., 2000); personal values (e.g., Ng et al., 2016; Verplanken et al., 2009); measures of cognitive performance (e.g., Arieli & Sagiv, 2018; Ji et al., 2004; Oyserman et al., 2009); and choices and behavior (e.g., Mourey et al., 2013; Shavitt et al., 2006; Spassova & Lee, 2013). However, very few studies have primed individualistic versus collectivistic mindsets in order to test the impact of culture on creativity. In one prominent example, Goncalo and Staw (2006) studied American students who were assigned to work in teams. They manipulated cultural mindset by emphasizing either the strength of the individual and the goal of “standing out” (individualistic mindset) or the strength of the group and the goal of “blending in” (collectivistic mindset). The findings indicated that team-level creativity was higher when the participants assumed an individualistic mindset. In another study, though one less directly relevant to the current research, Asian Americans who viewed their bicultural identity as highly integrated (i.e., they identified with both cultures and saw no conflict between them) reported greater need for uniqueness after exposure to a priming task highlighting American versus Chinese cultural icons (Mok & Morris, 2009, Study 1). To the best of our knowledge, no previous research has investigated how cultural mindset induced by language influences creativity. This study takes a first step in investigating this topic.

In this research, we use language as a cultural prime. Language is considered a natural and compelling cue for cultural knowledge, as it is deeply grounded in the cultural and social context in which it is used (e.g., Hong et al., 2001; Kay & Kempton, 1984; Trafimow et al., 1991). Studies have shown that the language used by bilinguals at any given moment leads to a culture-congruent response (e.g., Harzing & Maznevski, 2002; Hong et al., 2001; Lee et al., 2010; Ralston et al., 1995; see also review in Oyserman & Lee, 2008). Moreover, any act of verbal communication by definition involves language. Thus, relative to priming tasks that were developed in laboratory experiments (e.g., cultural symbols, Hong et al., 2000; isolated words and narratives, Oyserman & Lee, 2008), the realistic nature of verbal communication contributes to the ecological validity of the research. In addition, in contrast to many cultural primes, the use of language for communication has an advantage in that it can be manipulated at the same time as the dependent variable is measured.

### Bilingualism and Creativity

Research on bilinguals suggests that the capability to fluently speak more than one language has various cognitive consequences. With respect to creativity, experiments comparing bilingual and monolingual individuals performing creativity tests in the same language (e.g., English) have shown that bilinguals tend to score higher than monolinguals (Cummins, 1976; Cushen & Wiley, 2011; Hommel et al., 2011; Kharkhurin, 2007, 2009, 2011; Ricciardelli, 1992). This advantage may be related to bilinguals’ multicultural experience, and their exposure to diverse cultural traditions (Leung et al., 2008;

Tadmor et al., 2012); or it may reflect improved cognitive ability (Nothelfer, 2020). In this research, we investigate bilinguals *only* and test their performance in their mother tongue versus their second language.

So far, research focusing on bilinguals and investigating their performance in their mother tongue versus a second language has highlighted the advantages of using a foreign language, regardless of the cultural values that the language conveys. For example, one group of findings suggests that using a foreign language in decision making reduces bias. That stream of research distinguishes between fast, intuitive, emotional (and therefore biased) thinking (“System 1”) and slow, deliberative, systematic (and therefore unbiased) thinking (“System 2”), and suggests that using a foreign language puts individuals in a psychologically distant position, making them emotionally detached and their thinking more systematic (e.g., Cipolletti et al., 2016; Corey et al., 2017; Costa, Foucart, Arnon et al., 2014; Costa, Foucart, Hayakawa et al., 2014; Geipel et al., 2015; Keysar et al., 2012). However, research focusing specifically on creativity has found that as long as the language studied is not related to a culture emphasizing values of creativity, there is no effect of using a foreign language (Nothelfer, 2020). Given this null result for creativity, we do not expect that using a foreign language per se will encourage novel thinking.

### The Current Research

This research focuses on Arab citizens in Israel. As the biggest minority group in Israel (about 20% of the population), these citizens are extensively exposed to both the Arab and Israeli cultures. Relative to the larger Israeli society, which is considered more individualistic, Arab culture is more collectivistic, attributing high importance to tradition and group solidarity (e.g., Arieli & Sagiv, 2018; Cohen, 2007; Haj-Yahia, 1995; Schwartz, 1999). Most Arab citizens in Israel are bilingual, speaking both Arabic and Hebrew. Arabic typically dominates their kinship and communal environment, as well as elementary and high school education. Hebrew is dominant in the public arena (public services, malls, national television, major newspapers), and in social and higher education institutions. Thus, Arab Israelis almost universally speak Arabic as their native tongue and Hebrew as their second language.

We build on previous research showing the power of language to induce cultural mindsets (see meta-analysis, Oyserman and Lee, 2008) and on recent research among Arabs in Israel (Arieli & Sagiv, 2018). This research has shown both that Arabic induces a collectivistic mindset, whereas Hebrew induces an individualistic mindset, and that these differences are associated with differential performance in problem solving. On the other hand, for Arabs in Israel, working in Arabic may not only invoke a collectivistic mindset, but also the confidence and fluency that comes with working in one’s mother tongue. Similarly, for this population, working in Hebrew should not only generate an individualistic mindset but also carry the disadvantages that come with working in one’s second language.

This research was designed to investigate the impact of language on novel thinking, taking into account both the symbolic nature of language, which makes it a natural cultural prime, and the effect of language proficiency. Specifically, we expect that Hebrew, as an individualistic prime, will encourage original thinking. At the same time, we acknowledge the advantage of Arabic as a native language

for Arab Israelis. To adjudicate between these competing forces, we employ tasks requiring different degrees of ingenuity, while also comparing our main measure—originality—with another measure of creativity which requires less ingenuity, namely fluency. We reason that the advantage of working in one's mother tongue will become more prominent with tasks and measures requiring low or moderate levels of ingenuity. In such cases, the proficiency and confidence associated with working in one's native language may compensate for the incongruence between the collectivistic Arab culture and the demand for creativity. In contrast, when the task requires high levels of ingenuity, language proficiency by itself is less likely to benefit performance. Thus, when ingenuity requirements are higher the effect of the individualistic mindset triggered by Hebrew may be exposed more fully.

In two studies, we employ divergent thinking tasks varying in the level of ingenuity they require. Specifically, we evaluate creative performance in terms of both fluency (the number of ideas produced) and originality (the uniqueness of the ideas produced), reasoning that the latter requires higher ingenuity than the former. In Study 1, we test the effects of verbal language and of an additional nonlinguistic cultural prime (task instructions) on fluency and originality in a divergent thinking task. In Study 2, we employed an additional operationalization of task ingenuity by testing two different types of tasks. For both studies, our overarching theoretical hypothesis was that Hebrew would facilitate creative performance more than Arabic, but only when performance calls for a high (vs. moderate) level of ingenuity. In reporting each study, we present specific operational hypotheses reflecting the experimental design and the task(s) used.

## Study 1

Divergent thinking tasks are among the most common measures of creativity, as they allow testing of different levels of ingenuity and explicitly call for novel thinking. In a typical divergent thinking task, participants are asked to come up with novel ideas while focusing on specific stimuli (e.g., original uses for a common object or multiple examples of a product category).

Fluency and originality are both qualities of idea generation. They differ, however, in the degree to which they call for ingenuity (i.e., inventiveness or creative flair). Fluency is often treated as a crucial condition for innovation. For example, brainstorming, a popular idea-generating technique for groups, aims first for quantity, on the principle that a larger number of ideas are more likely to yield a reasonable set of high-quality ideas after screening. However, fluency does not guarantee originality. Consider, for example, a divergent thinking task focusing on original uses for a wool ball. One could produce a long list of ball games, ensuring a high fluency score. But as ball games tend to be quite similar to one another, the originality score for this list may not be very high. In contrast, short lists comprising only a few extremely novel ideas may receive a low fluency score, but a high score for originality. We thus expect cultural mindset induced by language to influence originality more than fluency on the basis that originality requires a higher level of ingenuity.

We suggested that because the priming effect of language arises partly from its associated cultural mindset and partly from the speaker's level of proficiency, language influences creativity in a particularly complex manner. Specifically, we argue that the cultural mindset primed by the language used when performing the task

(in this case, Hebrew vs. Arabic) will influence performance only in tasks requiring high ingenuity. To demonstrate the particularity of language as a prime, we compare the effect of language to the effect of a second cultural prime that induces a cultural mindset exclusively without also involving proficiency. Like other cultural primes commonly used in the literature, the prime we developed drew on fundamental cultural differences and was incorporated in the task instructions, such that the instructions were either decontextualized or contextualized (inducing an individualistic or collectivistic mindset, respectively; e.g., Hong et al., 2001; Mourey et al., 2013). If our reasoning is correct, a cultural prime that changes the nature of the task without affecting proficiency should have an equal effect on both measures of creativity—fluency (low ingenuity) and originality (high ingenuity).

We therefore hypothesize that:

*H1:* Instructions delivered in a decontextualized manner (inducing an individualistic mindset) will promote both higher fluency and higher originality compared to instructions delivered in a contextualized manner (inducing a collectivistic mindset).

*H2:* For bilinguals, whose mother tongue is Arabic, working in Hebrew (which induces an individualistic mindset) will promote higher originality (but not fluency) compared to working in Arabic (which induces a collectivistic mindset).

## Method

### *Transparency and Openness*

The original materials, data files, and syntax files used for this study are publicly available at <https://osf.io/sdfvg>. The syntax files contain the analytical codes needed to reproduce the analyses. All the materials used in this study are presented in English in this Method section, whereas the original versions (in Hebrew and Arabic) are presented online. The data used to validate the cultural mindsets induced by Hebrew and Arabic were drawn from a different research project (Roccas, 2017–2019). The data are available upon request.

### *Study Design*

We employed a 2 (language: Arabic vs. Hebrew)  $\times$  2 (instructions: contextualized vs. decontextualized) between-subjects design. All participants faced the same basic task—a classic divergent thinking task that calls for suggesting novel means of transportation (Gilhooly et al., 2007; see below). To induce a collectivistic versus individualistic cultural mindset, participants were randomly assigned to complete the study in either Arabic or Hebrew, respectively. They were further randomly assigned to one of two versions of the task, introduced either in a decontextualized manner (inducing an individualistic mindset) or a contextualized manner (inducing a collectivistic mindset). For exploratory purposes, personality scales were collected at the end.

### *Participants and Procedure*

**Sample.** Participants were 163 preundergraduate students attending a university open day dedicated to the Arab population (66% females, average age = 19.39). Arabic was the native language of all participants, and they all passed a threshold test for proficiency in Hebrew before attending the event. The participants were

recruited by a team of research assistants who communicated with them in Arabic. Those who volunteered to participate in the study were randomly assigned to one of two rooms, ostensibly because of space limitations. The experimenters in each room were bilingual Arab students proficient in both Arabic and Hebrew. The rooms themselves were almost identical and resembled ordinary classrooms. The participants conducted the entire experiment using booklets printed in either Hebrew or Arabic, depending on the condition they were allocated to. Within each language condition, half the participants were given booklets containing the contextualized instructions and the other half received booklets containing the decontextualized instructions. Participants were told only that the research project was designed to study creativity; they were not aware of either manipulation, and we did not instruct them explicitly to communicate in a specific language. The experimenters communicated only in the language of their condition, even if they were approached in the other language. All participants performed the tasks in the language they were assigned to. After completing the experimental task, participants received a chocolate bar as a token of gratitude for their participation.

**Recruitment, Stop Rule, and Exclusions.** We conducted a power analysis using G\*Power (Faul et al., 2007) to determine our sample size. A previous meta-analysis on the effect of individualism and collectivism primes (Oyserman & Lee, 2008) found an overall small effect of language primes ( $d = 0.23$ ), but this effect was appreciably larger for cognitive tasks ( $d = 0.77$ ). We therefore assumed a medium effect size ( $\eta_p^2 = .06$ , equivalent to  $d = 0.50$ ). The analysis indicated that 128 participants should be recruited to achieve 80% power, and we set this number as our minimum sample size. No participants who volunteered were excluded.

## Manipulations

**Language as a Cultural Mindset Prime.** The first manipulation was language (Arabic vs. Hebrew). To verify that using the Arabic (vs. Hebrew) language is associated with a more collectivistic (vs. individualistic) mindset, we analyzed existing cross-sectional data. The analyzed data had been collected in the lab as part of two different research projects. Participants in both projects were Arab students at an Israeli university, fluent in both Arabic and Hebrew. As the first task in the research, they completed the Schwartz Value Survey (SVS; Schwartz, 1992, 1999), which has been validated across cultures and languages. The SVS was collected in Hebrew in the first project ( $N = 503$ ) and in Arabic ( $N = 214$ ) in the second. We compared the importance attributed in each sample to embeddedness values—values

that prioritize preservation of the status quo, adherence to group norms, and suppression of self-interest, all of which are emphasized in collectivistic cultures (Schwartz, 1999). We also compared the importance attributed to autonomy values—values that prioritize self-expression and exploration, both intellectual and emotional, which are pursued in individualistic cultures (Schwartz, 1999). As expected, participants who completed the SVS in Arabic emphasized embeddedness values more ( $M = 0.23$ ,  $SD = 0.36$  vs.  $M = 0.01$ ,  $SD = 0.44$ ,  $t(340.13) = -6.44$ ,  $p < .001$ ,  $d = -0.57$ ) and autonomy values less ( $M = -0.28$ ,  $SD = 0.56$  vs.  $M = -0.02$ ,  $SD = 0.58$ ,  $t(715) = 5.81$ ,  $p < .001$ ,  $d = 0.47$ ) than those who completed it in Hebrew. Although these findings are based on cross-sectional data, they are consistent with our contention that compared to Hebrew, Arabic is more likely to induce a collectivistic (vs. individualistic) mindset.

**Task Instructions as a Cultural Mindset Prime.** As noted above, we used a classic divergent thinking task that calls for suggesting novel means of transportation (Gilhooly et al., 2007), and created two versions of it to prime individualism or collectivism. In developing the instructions, we built on past research on culture and cognition showing that Westerners tend to focus on objects, whereas East Asians tend to focus on the social context and on relationships between objects (see reviews in Nisbett, 2003; Nisbett & Masuda, 2003; Nisbett et al., 2001; Oyserman et al., 2009). Thus, task instructions that direct attention to an object in an abstract, noncontextualized way, or that detach the task from any particular social setting, serve as a cue for individualism. In contrast, instructions that direct attention to the social context in which the object will be used cue collectivism.

In the present study, in the contextualized condition (collectivism), participants were asked to suggest means of conveyance that would serve a specific family, whereas in the decontextualized condition (individualism), they were asked to think about novel means of conveyance generally. An English translation of the instructions can be found in Table 1 (note that in Hebrew and Arabic, the number of words in the two conditions is more balanced). Participants were asked to draw and name their ideas. Most of the participants wrote only idea titles, and only a few attached sketches. We therefore focused our analyses only on the textual responses. The time allotted to complete the task was 5 min.

To verify that the two sets of task instructions induce the respective cultural mindset, we ran a manipulation check. Using a separate sample, we studied the carryover effect of the instructions on self-construal as independent versus interdependent—one of the fundamental manifestations of individualism versus collectivism that is often used for manipulation checks (e.g., Arieli & Sagiv, 2018;

**Table 1**  
*Instructions for the Divergent Thinking Task (Study 1)*

Contextualized condition	Decontextualized condition
The Matar family includes a father, a mother, and three children. The family is looking for means of transportation that will meet its various needs.	Means of transportation allow people to travel and to move their belongings. Throughout human history, various means of transportation have been invented.
For example, they need to drop the children at school and pick them up, they need to get to work, meet friends, go out for trips, and so forth. Think of as many novel means of transportation as you can to meet the Matar family's needs.	For example, some transportation means are engine-powered and others are pulled by animals.
In the space below, draw and name the means of transportation you suggest.	Think of as many novel means of transportation as you can.
	In the space below, draw and name the means of transportation you suggest.

Goncalo & Kim, 2010; Lalwani & Shavitt, 2009; Oyserman & Lee, 2008; Zhang et al., 2016). One hundred and sixty-four Hebrew-speaking Israeli students were randomly assigned to the contextualized versus decontextualized conditions. They received the same instructions as in Table 1. After completing this task, the participants completed the Inclusion of Self in Other Scale (IOS), a pictorial scale designed to measure the level of proximity between the individual and the social group (Schubert & Otten, 2002; Swann et al., 2009). The measure consists of six pictures, each describing two circles with an increasing level of overlap. The participants were told that one circle represents themselves, whereas the other represents a group to which they belong. Their task was to choose the picture that best represents their relationships with the group. This measure has been used to assess people's self-concept as individualistic and independent (i.e., little overlap between the self and the other) versus collectivistic and interdependent (i.e., considerable overlap between the self and the other; e.g., Arieli & Sagiv, 2018). As expected, in the contextualized condition, the self-group overlap ( $M = 4.60$ ,  $SD = 1.01$ ) was higher than in the decontextualized condition ( $M = 4.23$ ,  $SD = 1.25$ ),  $t(150.37) = 2.08$ ,  $p = .039$ ,  $d = 0.33$ . The results support our contention that the contextualized and decontextualized versions of the instructions induce a collectivistic and individualistic mindsets, respectively.

### Measures

In this research, we focused on indexes assessing fluency and originality. We report other common indexes of divergent thinking in the Supplemental Materials, including flexibility, elaboration, and two alternative indexes for assessing originality.

**Fluency.** The fluency index for each participant was the total number of meaningful ideas generated by that individual ( $M = 4.52$ ,  $SD = 2.91$ ). We accepted all responses that indicated either a physical means of transportation or transportation in a metaphorical sense, reflecting concepts such as escape or transition. Together, the participants produced a total of 751 ideas. Fourteen responses that were meaningless or did not comply with the task instructions were classified as nonsense or irrelevant responses and excluded from further analysis (see Appendix A).

**Originality.** To obtain an originality score for each participant, we developed a four-step procedure drawing on Wilson et al. (1953). First, to avoid exposure to the language conditions, a bilingual research assistant translated the ideas proposed in the Arabic condition into Hebrew and those proposed in the Hebrew condition into Arabic. The ideas were then pooled into two versions of the same data set, one in Hebrew and one in Arabic.

Second, the ideas were coded by four judges. The ideas in Hebrew were coded by a bilingual judge as well as by a native Hebrew speaker who did not speak Arabic. The ideas in Arabic were coded by two bilingual judges. All the judges followed the same coding procedure. Ideas portraying similar means of transportation were classified together (e.g., the suggestions "car," "automobile," and "wheels" were classified into a category titled "car"; the suggestions "horse," "donkey," and "mule" were classified together under "animals used for transportation"). The 751 ideas produced were sorted into 75 categories (e.g., cars, submarines, planes, solar-powered vehicles, animals used for transportation, fantasy animals). Appendix A presents the full list of category names, the number of ideas sorted into

each category, and the by-category agreement for each set of two judges (6 comparisons for each category). Most of the by-category comparisons reflected full agreement between all four judges. Table 2 shows that the interrater reliability across all categories was high ( $IRR = .95-.92$ ). This set of analyses confirms that the coding is stable between the two languages and four judges. Hence, for convenience, for the analyses, we used the coding in the Hebrew version. A third judge resolved any disagreements between the two Hebrew-language judges.

Third, to compute an originality score, we calculated the frequency of each category in the sample. Categories that appeared less frequently were considered more original, and vice versa. We then weighed the frequency of each category by the total number of generated ideas. The resulting quotient was used to indicate the originality of each idea (Wilson et al., 1953).

Finally, because most participants provided more than one idea, we averaged the quotients for all the ideas proposed by a given participant to produce that participant's originality score. We used the linear transformation  $y = 1 - x$  so that higher scores would reflect higher originality. The originality scores ranged from 0.68 to 1.00 ( $M = 0.85$ ,  $SD = 0.10$ ).

## Results and Discussion

### Fluency

We conducted a two-way analysis of variance (ANOVA), entering language (Arabic vs. Hebrew) and mode of instructions (contextualized vs. decontextualized) as the independent variables, and the total number of ideas generated by the participant as the dependent variable. As hypothesized, a main effect of instructions emerged, such that participants completing the individualistic, decontextualized task generated significantly more ideas ( $M = 4.96$ ,  $SD = 3.13$ ) than participants completing the collectivistic, contextualized task ( $M = 4.04$ ,  $SD = 2.59$ ),  $F(1, 159) = 3.971$ ,  $p = .048$ ,  $\eta_p^2 = .024$ . In line with our expectations, the language used did not impact the number of generated ideas ( $M = 4.82$ ,  $SD = 2.77$  for Arabic vs.  $M = 4.18$ ,  $SD = 3.04$  for Hebrew),  $F(1, 159) = 1.835$ ,  $p = .178$ ,  $\eta_p^2 = .011$ , possibly suggesting a simultaneous effect of language proficiency (in the Arabic condition) and individualistic mindset (in the Hebrew condition). The interaction between language and instructions was not significant,  $F(1, 159) = 0.163$ ,  $p = .687$ ,  $\eta_p^2 = .001$ .

### Originality

We carried out another two-way ANOVA to test the effect of language and instructions on the originality of the generated ideas. As expected, the analysis yielded a main effect of instructions, such

**Table 2**  
*Interrater Reliability in Coding Across All Categories (Study 1)*

Raters	Hebrew II	Arabic I	Arabic II
Hebrew I	0.94	0.95	0.95
Hebrew II	—	0.95	0.92
Arabic I		—	0.95
Arabic II			—

*Note.* Hebrew I/II and Arabic I/II represent the first and second judges coding the Hebrew and Arabic versions of the generated ideas, respectively.

that participants in the decontextualized (individualistic) condition generated more original ideas ( $M = .88$ ,  $SD = .09$ ) than participants in the contextualized (collectivistic) condition ( $M = .82$ ,  $SD = .09$ ),  $F(1, 145) = 15.751$ ,  $p < .001$ ,  $\eta_p^2 = .098$ . These results suggest that the individualistic mindset prompted by the decontextualized instructions facilitated originality. Additionally, and as expected, the analysis yielded a main effect of language, with participants who worked in Hebrew generating more original ideas ( $M = .87$ ,  $SD = .10$ ) than participants who worked in Arabic ( $M = .84$ ,  $SD = .09$ ),  $F(1, 145) = 3.930$ ,  $p = .049$ ,  $\eta_p^2 = .026$ . There was no interaction between the two mindset primes (language by instructions),  $F(1, 145) = 0.074$ ,  $p = .786$ ,  $\eta_p^2 = .001$  (see Figure 1). These results confirm the hypothesis that fostering an individualistic mindset by using a language associated with cultural individualism (Hebrew) encourages originality in idea generation, even to the extent of overriding the natural advantage of using one's native tongue.

Overall, the results of this study support our hypotheses. The cultural prime embedded in the task instructions influenced both the quantity and the originality of the generated ideas (H1). Language-induced cultural individualism versus collectivism affected the originality of the generated ideas but not their quantity (H2). The effect of language on originality is small in magnitude, but it falls in the range found in the meta-analysis conducted by Oyserman and Lee (2008). This pattern supports our view that the influence of language is complex, deriving both from its symbolic nature (which, in the present case, allows it to trigger a particular cultural mindset) and from the psychological effects of using a language in which one feels more versus less competent.

On a theoretical level, we attribute the language effect found in this study to the cultural mindsets associated with Hebrew versus Arabic. However, in this sample, Hebrew and Arabic differ not only in the cultural mindset that they induce, but also in being a second versus a native language to the participants. One might therefore argue that the findings could be interpreted as resulting from use of a foreign language—that is, that using a foreign language may lead to more novel thinking. To rule out this alternative explanation, we reran this study among Jewish Israelis who completed it in either Hebrew or English. Similar to Arabs in Israel who speak Arabic as their mother tongue and begin to learn Hebrew only in school, we focused on

native Hebrew speakers who acquired their English in later childhood. Hebrew and English are both assumed to induce an individualistic mindset because they are both associated with cultures emphasizing individualism (Arieli & Sagiv, 2018; Sagiv, Schwartz, & Arieli, 2010; Schwartz, 1999). Thus, comparing the novelty of ideas generated while using these two languages constitutes a test of how use of a native (vs. second) language affects performance without involving a noticeable difference in cultural mindset. As expected, we replicated the effect of mode of instructions on both fluency,  $F(1, 145) = 20.329$ ,  $p < .001$ , and originality,  $F(1, 144) = 73.035$ ,  $p < .001$ , while finding a null effect for language use on both fluency,  $F(1, 145) = 0.001$ ,  $p = .975$ , and originality,  $F(1, 144) = 0.945$ ,  $p = .333$  (see the Supplemental Materials, for a detailed report of the method and results). These results strengthen our assertion that it is the cultural aspect of language, which impacts original thinking.

In Study 2, we move on to studying tasks that call for novelty in product development. Here again, we expect the use of Hebrew to bolster performance in tasks that require a higher level of novel and creative thinking.

## Study 2

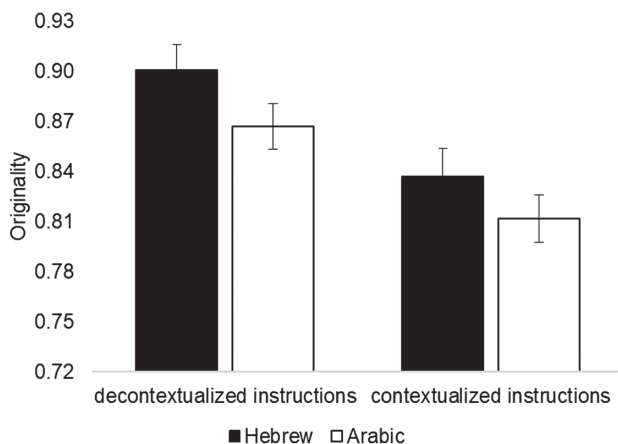
In this study, we aimed to investigate novel thinking in an applied domain. Given that most divergent thinking tests are context free, we developed tasks that follow the structure of classic divergent thinking tasks in calling for multiple novel ideas but are also grounded in an organizational context posing a business problem related to product innovation. By doing so, we respond to a call of many researchers in the field of creativity who encourage developing more realistic, domain-relevant tests (e.g., Barron & Harrington, 1981; Hennessey & Amabile, 2010; Sawyer, 2006; Weisberg, 2006).

We manipulate level of ingenuity in two ways. First, as in Study 1, we evaluated responses in terms of both fluency (the number of ideas suggested) and originality (the novelty of the generated ideas). As before, we consider originality as requiring greater ingenuity than fluency. Second, we developed two divergent thinking tasks that vary in the level of ingenuity they require. We reason that the cultural aspect of language will manifest in a task that requires high, rather than moderate, ingenuity. This is because performance in a task that requires only moderate ingenuity may solely reflect language proficiency. The greater the ingenuity a task demands, the more strongly will performance in the task depend on novel thinking.

In short, cultural individualism induced by Hebrew is expected to boost performance in both the measure (originality) and the task which call for higher levels of ingenuity. More precisely, we hypothesize that language and task will interact in influencing originality: participants working in Hebrew, a language that fosters an individualistic mindset, will articulate more original ideas than participants working in Arabic in a task requiring a high level of ingenuity. In a task requiring less ingenuity, however, working in Arabic (participants' mother tongue) may facilitate performance, thus concealing the potential effect of the individualistic mindset on originality. Following our reasoning that fluency does not require a high level of ingenuity, we do not expect a similar interaction for fluency. We therefore hypothesize:

**H3:** For bilinguals, whose mother tongue is Arabic, working in Hebrew (which induces an individualistic mindset) will promote higher originality (but not fluency) compared to working

**Figure 1**  
*Originality Scores by Language and Instruction Conditions (Study 1)*





in Arabic (which induces a collectivistic mindset). This effect will be particularly apparent in the task requiring greater ingenuity.

## Method

### *Transparency and Openness*

The original materials, data file, and syntax file used for this study are publicly available at <https://osf.io/sdfvg>. The syntax file contains the analytical codes needed to reproduce the analyses. All the materials used in this study are presented in English in this Method section, whereas the original versions (in Hebrew and Arabic) are presented online.

### *Study Design*

The study used a 2 (language: Hebrew vs. Arabic)  $\times$  2 (level of ingenuity: moderate vs. high) full factorial design. To induce a collectivistic versus individualistic cultural mindset, participants were randomly assigned to complete the study in either Arabic or Hebrew, respectively. They were further randomly assigned to one of two divergent thinking tasks in the domain of new product development, differing in their level of required ingenuity (see below). A personality measure was collected at the end for exploratory purposes.

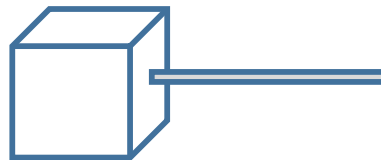
### *Participants and Procedure*

**Sample.** Participants were 137 preundergraduate students who volunteered to participate anonymously in this study (54% females, average age = 19.12). Arabic was the native language of all participants, and they all passed a threshold test for proficiency in Hebrew before attending the event. In recruiting the participants, we followed the same protocol as detailed in Study 1.

**Table 3**

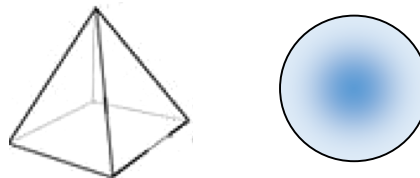
#### *Instructions for the Two Product Development Tasks (Study 2)*

Cube & Stick A wood products factory mistakenly produced a stock of 10,000 wooden cubes with a wooden stick extending from one side. The configuration looked like this:



The manager of the factory wants to sell this item as it is, but he is not sure what function it may serve. Try to think of as many novel uses as you can for this product that would be attractive for customers. You may change its orientation, size, or position.

Ball & Pyramid A wood products factory mistakenly produced a stock of 10,000 small wooden pyramids and 10,000 small wooden balls that looked like this:



The manager of the factory wants to create a new product by combining one pyramid and one ball in an original way. Try to think of as many possibilities as you can to combine the pyramid and the ball in a way that will create a novel product attractive for customers. You may combine the ball and the pyramid in any way you like, and change their orientation, size, or position.

*Note.* See the online article for the color version of this table.

**Recruitment, Stop Rule, and Exclusions.** A power analysis conducted in G\*Power indicated that 128 participants would be needed to detect a medium effect with 80% power ( $\eta_p^2 = .06$ , equivalent to  $d = 0.50$ ; see Study 1). The study took place during an open day at a state university in Israel that was targeted for the Arab population. For ethical reasons, we allowed all candidates who showed interest in the study to take part, and added a question measuring their Hebrew proficiency. Overall, 160 participated in the experiment. Of these, 23 were excluded because they rated their Hebrew proficiency as only 1 on a 1–7 fluency scale, where 1 = *basic* and 7 = *proficient* (average proficiency of the final sample = 5.12). After completing the experimental task, participants received a chocolate bar as a token of gratitude.

### *Tasks*

**Divergent Thinking Tasks.** For this study, we developed two divergent thinking tasks—the Cube & Stick and Ball & Pyramid tasks (see Table 3). Both tasks call for product innovation and are grounded in an organizational context. However, the tasks differ in the extent to which they require ingenuity.

Creative product development potentially requires both crafting a form (e.g., a product configuration) and considering its novel functionality (Sagiv, Arieli et al., 2010). In the Cube & Stick task, participants were introduced to a configuration that included two attached components (a cube and a stick) and were asked to propose as many novel uses for this configuration as they could. In contrast, in the Ball & Pyramid task, participants were introduced into two individual components (a ball and a pyramid) and were asked both to suggest the ways of combining them and to propose novel uses for their suggested configurations. Overall, the first task requires focusing only on the uses of a given product configuration, whereas

the latter requires both crafting a product configuration and proposing novel uses. Thus, theoretically, the former requires relatively lower levels of ingenuity and novel thinking than the latter.

To further provide empirical support for this distinction, we conducted a separate study (90 students, 53% female,  $M_{\text{age}} = 27.26$ ). We presented both tasks to participants in a random order and asked them to rate the degree to which each requires ingenuity on a scale from 1 (*does not require ingenuity at all*) to 7 (*requires very high ingenuity*). In line with our reasoning, the Ball & Pyramid task was rated higher in required ingenuity ( $M = 5.44$ ,  $SD = 1.32$ ) than the Cube & Stick task ( $M = 4.52$ ,  $SD = 1.63$ ),  $t(89) = 5.41$ ,  $p < .001$ ,  $d = 0.57$ .

The participants in the main study had 3 min to perform their task. To verify that participants understood their assignment, they first completed a practice task (whichever of the two tasks they would not complete in the actual experiment). This practice phase was included to prevent between-subjects variation in comprehension of the instructions that could affect performance in the critical, time-restricted task.

## Measures

As in Study 1, we focus on fluency and originality. Additional analyses on other indexes of divergent thinking are presented in the Supplemental Materials.

**Fluency.** As in Study 1, the fluency index was the total number of meaningful ideas generated by the participant. Together, participants performing the Cube & Stick task produced a total of 533 ideas, and those performing the Ball & Pyramid task suggested 394 ideas. Fifty responses in the Cube & Stick task and 54 responses in the Ball & Pyramid task that were meaningless or did not comply with the task instructions were classified as nonsense or irrelevant and were excluded from further analysis (see Appendix B).

**Originality.** To obtain an originality index, we followed the same four steps described in Study 1, conducting them separately for the two tasks. First, all ideas written in Arabic were translated into Hebrew by a bilingual research assistant. Given that we did not find differences between the Hebrew and Arabic coding in Study 1, we did not replicate the coding procedure in Arabic as well. The ideas were then pooled to create one data set. Second, two judges (one only Hebrew speaking and one bilingual), blind to the language condition, sorted them into categories (IRR was .98 for the Cube & Stick task and .93 for the Ball & Pyramid task). Ideas conveying similar functionality were classified together (e.g., “outdoor camping hammer” and “wooden hammer” were classified into a category titled “hammers”; “stool” and “chair” were classified under the category “chairs”). The 533 ideas generated in the Cube & Stick task were sorted into 24 categories of products (e.g., hammer, furniture, kitchen appliance), and 394 ideas suggested in the Ball & Pyramid task were sorted into 17 categories (e.g., signs, balance games, furniture). The number of categories differs between the tasks because it was directly determined by the pool of ideas generated by the participants. Appendix B presents all the categories in each task, as well as the number of ideas in each category, and the by-category agreement between the two judges. Most of the by-category comparisons reflected full agreement between the judges, and the rest yielded very high agreement. Disagreements were resolved through discussion with a third judge.

Third, we computed the ratio between the frequency of each category in the sample and the total number of ideas raised for the task. Less frequent categories were considered more original, and vice versa. The originality score for each idea was the originality score of its corresponding category (Wilson et al., 1953). Fourth, an originality index was computed for each participant by averaging the originality scores for all that participant’s ideas and applying the linear transformation used in Study 1 ( $y = 1 - x$ ). Higher scores indicate that the ideas proposed by the participant are shared by a lower percentage of people completing the task, thereby reflecting higher originality. Participants’ originality scores ranged from 0.78 to 0.99 ( $M = 0.88$ ,  $SD = 0.05$ ).

## Results and Discussion

### Fluency

We conducted a two-way ANOVA, entering the language used (Arabic vs. Hebrew) and the level of ingenuity required by the task (moderate vs. high) as the independent variables, and the total number of ideas generated by the participants as the dependent variable. A main effect of ingenuity level emerged, such that participants assigned to the Ball & Pyramid task generated significantly fewer ideas ( $M = 2.14$ ,  $SD = 1.60$ ) than participants assigned to the Cube & Stick task ( $M = 2.71$ ,  $SD = 1.92$ ),  $F(1, 133) = 4.154$ ,  $p = .044$ ,  $\eta_p^2 = .030$ . These findings may support our reasoning that the Ball & Pyramid task is more challenging, requiring more effort and ingenuity than the Cube & Stick task. The language used by the participants did not impact the fluency of generated ideas,  $F(1, 133) = 0.273$ ,  $p = .602$ ,  $\eta_p^2 = .002$ , possibly suggesting that using one’s native language (Arabic for our participants) and the individualistic mindset induced by Hebrew both influenced the stream of ideas, resulting in no advantage for either. The interaction between language and ingenuity level was insignificant,  $F(1, 133) = 1.946$ ,  $p = .165$ ,  $\eta_p^2 = .014$ .

### Originality

To test the effect of language on the originality of the generated ideas, we again carried out a two-way ANOVA, entering the language used (Arabic vs. Hebrew) and level of ingenuity required by the task (moderate vs. high) as two factors. The analysis yielded a main effect of ingenuity level, such that participants assigned to the Ball & Pyramid task generated fewer original ideas ( $M = .86$ ,  $SD = .06$ ) than participants assigned to the Cube & Stick task ( $M = .90$ ,  $SD = .04$ ),  $F(1, 120) = 26.675$ ,  $p < .001$ ,  $\eta_p^2 = .182$ . The meaning of this difference is not clear, as the originality index for each task was calculated separately and was based on tasks with a different number of categories. More important for the present purpose, the language used by participants significantly affected their originality, with participants who completed the questionnaire in Hebrew generating overall more original ideas ( $M = .89$ ,  $SD = .05$ ) than participants completing the questionnaire in Arabic ( $M = .87$ ,  $SD = .06$ ),  $F(1, 120) = 5.692$ ,  $p = .019$ ,  $\eta_p^2 = .045$ . Also importantly, these effects were qualified by an interaction between language and ingenuity level,  $F(1, 120) = 9.897$ ,  $p = .002$ ,  $\eta_p^2 = .076$ . Specifically, in the Cube & Stick task (which called for only moderate levels of ingenuity), the originality of the ideas did not differ between the Hebrew ( $M = .90$ ,  $SD = .04$ ) and Arabic ( $M = .91$ ,  $SD = .04$ )

conditions,  $t(120) = .516, p = .607$ . However, in the Ball & Pyramid task, participants using the Hebrew language generated more original ideas ( $M = .88, SD = .05$ ) than those working in Arabic ( $M = .84, SD = .05$ ),  $t(120) = 4.088, p < .001$  (see Figure 2). These results support H3, showing that the individualistic mindset induced by the Hebrew language promotes generating more original ideas, particularly in tasks that call for higher levels of ingenuity (the Ball & Pyramid task).

Overall, the results of this study supported our expectations regarding the effects of language in each of the tasks. Because the tasks were developed to pose different levels of ingenuity and yielded distinct sets of categories and samples of ideas (see Appendix B), the main effect of level of ingenuity on fluency and originality should be considered with reservations.

### General Discussion

In the contemporary global workplace, bicultural or even multicultural employees and managers are increasingly common (Brannen & Thomas, 2010). Consequently, managers and scholars are interested in identifying what benefits such individuals may bring to the organization, as well as understanding the associated challenges (Fitzsimmons, 2013). Language management in organizations, broadly speaking, is the study and practice of how organizations manage a culturally diverse workforce whose members have varying levels of proficiency in multiple languages. The current research advances our knowledge in this realm by examining creativity among bilingual Arab citizens in Israel—a population who have the ability, through their choice of language, to assume either an Arab (i.e., collectivistic) cultural mindset or an Israeli (i.e., individualistic) cultural mindset. As such, the present study also adds to our understanding of language management, and specifically, how managers can meet the challenge of linguistic diversity in a way that improves organizational performance (Feely & Harzing, 2003).

The current work considers the role played by language in divergent thinking and particularly the effect of using language to induce an individualistic (vs. collectivistic) cultural mindset. It seeks to deepen our understanding of how language impacts originality and novel thinking by considering two competing effects: the positive effect of an individualistic mindset induced by one

language and the positive effect of mother-tongue expertise in another. We investigate these effects in two studies using different cultural primes, different measures, and tasks requiring different levels of ingenuity. Together, our results suggest that differences in performance reflect the values primed (individualism vs. collectivism) as long as the demand for ingenuity is high. When the demand for ingenuity is lower, proficiency in one's mother tongue may also facilitate performance, thus reducing cultural differences.

In Study 1, we used a single basic divergent thinking task and employed two cultural primes—language and task instructions. Performance was evaluated in terms of fluency (the quantity of ideas generated) and originality (uniqueness of the ideas). As hypothesized, we found that the cultural prime induced by the task instructions yielded differences in both fluency and originality, such that the individualistic prime (decontextualized instructions) yielded better performance than the collectivistic prime (contextualized instructions). The impact of language was, as expected, more complex. Compared to Arabic, Hebrew facilitated the generation of original ideas (an element of creativity that requires more ingenuity) but did not affect the quantity of ideas produced (an element that requires less ingenuity). This suggests that participants' proficiency in Arabic (their mother tongue) equipped participants with a different kind of advantage than that granted by an individualistic cultural mindset.

In Study 2, we further investigated the interplay between language and the level of ingenuity required by the task using two divergent thinking tasks that call for different levels of ingenuity. Again, performance was assessed in terms of fluency and originality. Our findings showed that using Hebrew facilitated performance only in the task requiring a high level of ingenuity and only with respect to the originality measure, not fluency. When the task or measure called for lower ingenuity, performance in Arabic and Hebrew did not differ.

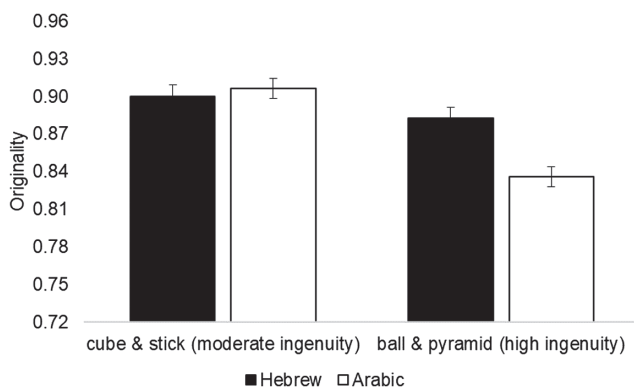
The findings support our overarching hypothesis, indicating that the impact of cultural mindset induced by language on creativity depends on characteristics of the task. They also highlight the importance of considering the possibility that different forces may be at work concurrently in cultural research. In our case, we conceptualized language as a cultural prime, whereas at the same time acknowledging the benefits associated with the sense of competence and security that accompanies communication in one's native language. These findings shed light on cultural differences in creativity and on language diversity. They also have implications for managers tasked with facilitating creative performance in culturally diverse teams.

### Cultural Individualism Versus Collectivism and Creativity

Results of previous studies have shown inconsistent findings regarding the impact of cultural individualism versus collectivism on creativity, suggesting that the relationship between this cultural dimension and creativity is complex, susceptible to other forces that may interfere and shape the pattern of relationships. In this study, we responded to this concern both theoretically and methodologically.

Theoretically, we acknowledge the multidimensional nature of creativity and focus on one aspect of creativity—novelty in divergent thinking. As such, we had clear expectations regarding

**Figure 2**  
Originality Scores by Language Condition and Task (Study 2)



the positive influence of individualism (relative to collectivism) on performance because, by definition, individualism encourages challenging the status quo, whereas collectivism encourages maintaining the status quo. In other forms of creative thinking, however, collectivism may provide advantages for creativity. For example, research on culture and cognition and on problem solving has shown that a collectivistic mindset contributes to thinking processes involving context dependency and associations between objects and concepts (Arieli & Sagiv, 2018; Nisbett, 2003; Nisbett et al., 2001; Nisbett & Masuda, 2003; Norenzayan et al., 2002; Varnum et al., 2010). Future research could expand our study by investigating additional tasks that differ in the type of creativity they require. Predictions regarding the impact of this cultural dimension on creativity should consider the specific features of the task.

In terms of methodology, the inconsistent results in the literature on individualism versus collectivism and creativity also call for more rigorous study designs than the cross-sectional studies typically conducted in the field. Drawing on the CASC theory, which posits that cultural mindsets are malleable and that individuals can shift from one mindset to another, we conducted two controlled experiments. In addition, our research design allowed testing the power of language as a cultural prime while also considering alternative factors that may influence performance (in our case, language proficiency in one's mother tongue). Thus, we were able to go beyond simple associations to a more complex consideration of how culture impacts creative performance.

Our results show that when a task requires superior ingenuity, the individualistic mindset induced by the use of a language associated with cultural individualism (Hebrew in the present case) facilitates performance. However, when the task requires more modest levels of creativity, other factors may play a role as well. Our results are in line with the interactionist theory of creativity, which defines creativity as a product of the individual's attributes and characteristics of the situation (Woodman et al., 1993). Any situation involves contextual and social factors that can promote or inhibit creative expression. In our research, cultural mindset induced by the language used in the task and the need for ingenuity (a task characteristic) serve as contextual factors. At the individual level, we focused on participants' bilingual and bicultural backgrounds.

Integrating the situational and personal factors, we hypothesized that a match between cultural mindset and task demands would facilitate performance. We thus predicted and showed that the individualistic mindset induced by Hebrew facilitates performance in tasks that call for high ingenuity compared to the collectivistic mindset induced by Arabic. We did not find a language effect on tasks requiring lower levels of ingenuity, suggesting that other contextual or personal variables may be more important in such tasks. In our study, it seems that using their native language—Arabic—for moderate-ingenuity tasks gave our participants an advantage equivalent to that provided by using Hebrew, which primed an individualistic mindset.

Our findings support the idea that cultural influence is complex, and that cultural groups are not unitary in their worldviews and backgrounds. As such, our results support CASC theory and the older interactionist theory of creativity in calling for new perspectives on past findings. By considering the contextual and personal factors at play in each study, it may be possible to identify factors

other than cultural mindsets and values that can explain unexpected results.

This research also sheds light on the use of language as a cultural prime. Language has many advantages as a cultural prime: It is a key ingredient of culture, it is unobtrusive, and it operates continually throughout the experiment. At the same time, results of a meta-analysis comparing the effect of various cultural primes on individualism or collectivism showed that language yielded the weakest overall effect compared to other priming techniques ( $d = 0.23$ ). The findings also showed that the effects vary considerably ( $Q = 41.13$ ,  $p < .001$ ), suggesting that other factors may influence performance (Oyserman & Lee, 2008). Our findings offer insights into the power of language to induce cultural mindsets by considering the differences between native and second languages. Future studies may study the boundary conditions of language as a cultural prime and identify other variables that may serve as alternative predictors or as moderators.

### Managing Language Diversity in Organizations

In today's multicultural landscape, language diversity can be a challenge for organizations (Yanaprasart, 2016). Many multinational corporations resolve this problem by choosing one official language as a way to establish efficient organizational communication. Yet, a "one language fits all" policy is likely to affect task performance—for better or for worse. Ensuring that all employees use a single common language facilitates smooth and organized communication. A multilingual policy, where individuals have autonomy to express themselves in their native tongue, demands more resources and requires a well-defined organizational structure and norms. At the same time, a multilingual policy has various advantages. First, regardless of any individual-level effects, cultural diversity has been shown to improve creativity at the team level by bringing together multiple bodies of knowledge, raising the likelihood that an original combination of thoughts will lead to novel ideas or solutions (Hennessey & Amabile, 2010). Second, in line with the current research, allowing organization members to switch between different languages may enable them to assume the cultural mindset that is most beneficial for a given task (e.g., an individualistic mindset for tasks requiring high originality).

Our participants were as creative when working in a language associated with collectivism (Arabic, participants' mother tongue) as when working in a language associated with individualism (Hebrew) only in a measure (fluency) or task (the Cube & Stick task) calling for moderate (vs. high) levels of ingenuity. This was not the case when a collectivistic or individualistic mindset was induced through the task instructions rather than language (Study 1). The results of Study 1 show that contextualized instructions (which induce a collectivistic mindset) dampened creativity regardless of the ingenuity measure (i.e., fluency or originality). We reason that the confidence and security associated with working in one's mother tongue canceled out the dampening effect of the collectivistic mindset induced by Arabic—but only when lower levels of creativity were called for.

### Limitations and Future Research

The two experiments presented in this article support our theoretical predictions. Additional studies could help in advancing more

nuanced predictions and strengthening the internal validity of the studies. For example, including a test for proficiency in Hebrew in the experiment would make it possible to statistically disentangle the impact of cultural mindset from the impact of language proficiency and to test the extent to which cultural mindset induced by language depends on language proficiency.

Extensive measurement of language proficiency could also help solve what may be an inconsistency between the results of the two studies. That is, in Study 1, which employed a task that requires a moderate level of ingenuity, a language effect emerged for the originality measure. However, in Study 2, the effect of language on originality emerged only for the task that required a high level of ingenuity but not for the task that required a lower level of ingenuity. One possible explanation for this inconsistency is that the effect of cultural mindset induced by language is susceptible to language proficiency. For example, it is possible that the participants in Study 1 were highly proficient in both Hebrew and Arabic, whereas participants in Study 2 were more proficient in Arabic than in Hebrew. If so, the superiority of Arabic as a native language would play a smaller role in Study 1 than in Study 2.

Additional studies may also make it possible to test the robustness of the findings using more balanced instructions. For example, the instructions used to prime cultural mindset in Study 1 could be phrased almost identically, but while asking participants to focus on people in general versus a specific family. Similarly, Study 2 could employ the same shapes either connected or separated to make the tasks more parallel. Future studies could also use more balanced conditions (e.g., employing the same neutral practice problem). Another interesting advancement would be to decompose the creative process into additional elements beyond fluency and originality, and then test the influence of cultural mindset on performance for each. Such an experiment would reveal a fuller picture of the impact of individualism versus collectivism on creativity, demonstrating both the drawbacks and advantages of each cultural mindset.

The current research focused on a single bilingual group—Arabs in Israel. Future research could enhance the generalizability of our findings by studying the impact of cultural mindset on creativity among additional bicultural groups. For example, it would be interesting to study two groups of bilinguals who speak the same two languages but differ in the language considered their mother tongue. Another possibility is to study bilinguals in other multicultural social and organizational contexts. For example, employees and managers are often exposed to a range of cultures, whether as expatriates, through participation in cross-cultural joint ventures, or by working with clients, suppliers, and colleagues from diverse cultural backgrounds. Future research could investigate the role that cultural exposure plays in forming cultural mindsets and how that affects creative performance in various types of tasks.

## Conclusions

To date, most research on culture and creativity has focused on identifying cultural attributes that are associated with creativity. The findings of the current research take us beyond this perspective, showing that the relationship between culture and creativity is also affected by features of the task, including the language in which it is performed. Focusing on originality and novel thinking—we considered two potentially competing effects of language: first, the potential of certain languages to induce a certain cultural mindset

(in particular, an individualistic vs. collectivistic mindset); and second, the feelings of ease, comfort, and competence that emerge when people communicate in their native tongue. Taken together, our results show that the individualistic mindset induced by language promotes originality when the demand for ingenuity is high. Our findings thus provide a new perspective for evaluating organizational policies that aim to establish “one-size-fits-all” linguistic homogeneity.

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**Appendix A**

**Categories of Responses Obtained in Study 1 and Rate of Agreement Between Each Set of Two Judges**

Category	N responses	H-I versus H-II	H-I versus A-I	H-I versus A-II	H-II versus A-I	H-II versus A-II	A-I versus A-II
Nonsense or irrelevant responses	14	1	0.88	0.88	0.88	0.88	0.75
Car	234	0.94	0.94	0.94	1	0.97	0.97
Two wheeler	77	1	1	1	1	1	1
Train	48	1	1	1	1	1	1
Animals used for transportation	47	1	1	1	1	1	1
Marine vehicles	36	0.80	1	1	0.80	0.80	1
Plane	31	1	1	1	1	1	1
Magic	26	0.75	1	0.92	0.75	0.67	0.92
Using feet	15	0.75	1	1	0.75	0.75	1
Wagon	12	1	0.80	0.80	0.80	0.80	1
Scooter	12	1	1	1	1	1	1
Ski board	11	1	1	1	1	1	1
Dragged by animals	11	1	1	1	1	1	1
Spaceship	10	1	1	1	1	1	1
Flying vehicle	9	1	1	1	1	1	1
Social interactions	8	0.83	1	0.67	0.83	0.5	0.67
Moving furniture	6	1	1	1	1	1	1
Air animal	6	0.80	0.80	1	1	0.80	0.80
Submarine	6	1	1	1	1	1	1
Marine animal	6	1	1	1	1	1	1
Present	6	1	0.50	1	0.50	1	0.50
Shoes with wheels	6	1	1	1	1	1	1
Personal flight tool	5	0.80	0.60	0.80	0.80	1	0.80
Solar vehicles	5	0.75	0.75	1	1	0.75	0.75
Heavy vehicle	5	1	1	1	1	1	1
Emergency vehicles	5	1	1	1	1	1	1
Hot-air balloon	5	1	1	1	1	1	1
Helicopter	5	1	1	1	1	1	1
Cable lift	4	1	1	1	1	1	1
Book	4	1	1	1	1	1	1
Terrestrial animal not used for transportation	3	1	1	1	1	1	1
Fantasy animal	3	1	1	0.67	1	0.67	0.67
Springboard	3	1	1	1	1	1	1
Beverage	3	1	1	1	1	1	1
Flying stroller/scooter	3	1	1	1	1	1	1
Stars	3	1	1	1	1	1	1
Piggyback ride	3	1	1	1	1	1	1
Zeppelin	3	1	1	1	1	1	1
Caravan	3	1	1	1	1	1	1
Flying bus/flying train	2	1	1	1	1	1	1
Home	2	1	1	1	1	1	1
Human	2	1	1	1	1	1	1
Game	2	1	1	1	1	1	1
Cellphone	2	1	1	1	1	1	1
Writing tools	2	1	1	1	1	1	1
Canopy	2	1	1	1	1	1	1

(Appendices continue)



## Appendix A (continued)

Category	N responses	H-I versus H-II	H-I versus A-I	H-I versus A-II	H-II versus A-I	H-II versus A-II	A-I versus A-II
Wings	2	1	1	1	1	1	1
Music	2	1	1	1	1	1	1
Heart	2	1	1	1	1	1	1
School	2	1	1	1	1	1	1
Television	2	1	1	1	1	1	1
Tree	2	1	1	1	1	1	1
Robot	1	0.50	0.50	0.50	0.50	0.50	1
Antigravity vehicle	1	1	1	1	1	1	1
Cape	1	1	1	1	1	1	1
Wheel	1	1	1	1	1	1	1
Electric shoes	1	1	1	1	1	1	1
Slingshot	1	1	1	1	1	1	1
Electric vehicle	1	1	1	1	1	1	1
Driverless vehicle	1	1	1	1	1	1	1
Pump	1	1	1	1	1	1	1
Springboard	1	1	1	1	1	1	1
Tent	1	1	1	1	1	1	1
Loneliness <sup>a</sup>	1	1	1	1	1	1	1
Happiness <sup>a</sup>	1	1	1	1	1	1	1
News	1	1	1	1	1	1	1
Window	1	1	1	1	1	1	1
Chemistry	1	1	1	1	1	1	1
Money	1	1	1	1	1	1	1
Laptop	1	1	1	1	1	1	1
Family trip	1	1	1	1	1	1	1
Hand	1	1	1	1	1	1	1
Butterfly	1	1	1	1	1	1	1
Speech	1	1	1	1	1	1	1
Tornado	1	1	1	1	1	1	1

Note. H = Hebrew; A = Arabic.

<sup>a</sup>We accepted this response as legitimate since it met the criterion of transportation in a metaphorical sense (e.g., escape).

## Appendix B

## Categories of Responses Obtained in Study 2 and Rate of Agreement Between Judges

Category	N responses	Agreement
Cube & Stick task		
Nonsense or irrelevant responses	50	0.94
Hanger	90	0.97
Hammer	82	1
Leisure/game	74	1
Furniture	53	0.98
Decorative object	28	1
Garden/outdoors	27	1
Signage	19	1
Kitchen appliance	18	1
Sports equipment	16	1
Electrical installation	13	1
Weapon/target	12	1
Work tools	11	1
Raw material	7	0.86
Stabilizing rod	7	0.86
Fixation	6	1
Barrier/fence	5	1
Creation	4	1
Elevation	3	1
Separation tool	3	1
Office equipment	2	1
For the hair	1	1
Massage/scratch	1	1
Cleanliness	1	1

(Appendices continue)

**Appendix B** (continued)

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Ball and Pyramid task		
Nonsense or irrelevant responses	54	0.98
Leisure/game	85	0.93
Connections	70	0.94
Decorative object	54	0.91
Furniture	27	1
Structure	22	0.86
Study tool	19	0.89
Storage	12	0.75
Clothing item	12	1
Balance	9	1
Signage	9	0.89
Kitchen appliance	6	1
Fixation	5	0.80
Vehicle	4	1
Body accessory	2	1
Professional device	2	1
Navigation	2	1

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