

# Thinking Outside the Box: Multiple Identity Mind-Sets Affect Creative Problem Solving

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## Abstract

Rigid thinking is associated with less creativity, suggesting that priming a flexible mind-set should boost creative thought. In three studies, we investigate whether priming multiple social identities predicts more creativity in domains unrelated to social identity. Study 1 asked monoracial and multiracial participants to write about their racial identities before assessing creativity. Priming a multiracial's racial identity led to greater creativity compared to a no-prime control. Priming a monoracial's racial identity did not affect creativity. Study 2 showed that reminding monoracials that they, too, have multiple identities increased creativity. Study 3 replicated this effect and demonstrated that priming a multiracial identity for monoracials did not affect creativity. These results are the first to investigate the association between flexible identities and flexible thinking, highlighting the potential for identity versatility to predict cognitive differences between individuals who have singular versus multifaceted views of their social selves.

## Keywords

multiracial, social identity, creativity, racial identity, priming

Rigid thinking in one domain is known to predict inflexibility in other domains, leading to less divergent thought and creative insight (Sassenberg & Moskowitz, 2005; Schooler & Melcher, 1995; Ward, 1994). Creativity occurs more frequently when people consider multiple perspectives rather than relying solely on preexisting beliefs (e.g., Nijstad, De Dreu, Rietzschel, & Baas, 2010; Sassenberg & Moskowitz, 2005; Sligte, de Dreu, & Nijstad, 2011). Research comparing the creativity of bicultural individuals (those who identify with both their home and host cultures vs. assimilated or separated individuals who identify with only a single culture) is one source of support (e.g., Simonton, 1988; Ward, 1994). Bicultural individuals are found to demonstrate more novelty on a creative uses task, a more complex thinking style, and greater workplace innovation (Tadmor, Galinsky, & Maddux, 2012). Other work also shows that when different social identities are activated, this change in mind-set affects cognitive tendencies including academic outcomes, face perception, and social behavior (e.g., Aronson, Steele, Salinas, & Lustina, 1998; Chiao, Heck, Nakayama, & Ambady, 2006; Gaither, Sommers, & Ambady, 2013; Pauker, Ambady, & Freeman, 2013). Research also highlights that levels of integrated identities or management of multiple identities also influences creativity by increasing accessibility to cognitive resources (Cheng, Sanchez-Burks, & Lee, 2008). Taken together, these findings suggest that another pathway toward creativity may be the strategic activation of a multifaceted self-concept that can be harnessed to facilitate increases in creativity.

Although some individuals (e.g., monocultural individuals) may be predisposed to think about the social self in relatively less flexible ways, reminding individuals of their multifaceted social identities may offer a simple way to boost creativity. This research aims to specify that the social self is far from a constant entity, using priming to investigate the link between social identities and creativity. Thus, we suggest that a bicultural identity is not necessary to increase creativity, but rather that situational priming should facilitate a more versatile, integrated, or flexible self-view that transfers to cognitive outcomes.

To test these predictions, we conducted three studies examining whether reflecting on one's multiple social identities predicts general forms of creativity. We expected that reminding individuals of their versatile identities should boost creativity in cognitive domains unrelated to social identity. Although researchers have defined creativity in a number of ways, we measure two main types of thinking styles—convergent and

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divergent thinking. Convergent thinking occurs when someone is searching for one specific outcome on a given problem, whereas divergent thinking occurs when someone is asked to generate as many responses as possible based on a relatively weak set of guidelines (McCrae, 1987). Although both types of creative thinking involve decision making and idea generation, the constraints and cognitive control needed for both types differ, suggesting they measure different abilities.

To establish our priming methods using a population similar to the previously examined bicultural population, Study 1 primed multiracial and monoracial participants' racial identities to see whether activating a flexible (multiracial) versus a concrete (monoracial) racial identity has differential effects on creativity. Recent work shows that priming essentialist or fixed views of group membership leads to less creativity on tasks measuring association and insight abilities (Tadmor, Chao, Hong, & Polzer, 2013). However, multiracials often exhibit versatility in their own racial identities, including an ability to navigate between identities as circumstances demand (Chiao et al., 2006; Gaither et al., 2013; Rockquemore, Brunnsma, & Delgado, 2009), suggesting that a multiracial identity could be one specific type of social identity structure that, when activated, predicts cognitive flexibility.

However, we do not believe that this effect is unique to bicultural or multiracial individuals, and Study 2 capitalized on this by asking a more general sample of participants to acknowledge that they too have multiple social identities. Although tendencies toward rigid thinking predispose people to think about the self in rigid ways (Linville, 1985, 1987; Roccas & Brewer, 2002), everyone, no matter their racial background, has multiple social identities (e.g., race, gender, age, occupation, and hobbies; Lickel et al., 2000). Finally, to examine the relevancy of the identities primed and their link to creativity, Study 3 combined the first two studies by exploring whether multiracial priming only affects creativity for those who actually identify as multiracial. Taken together, these studies examine for the first time the relationship between a flexible self-concept (regarding race or identity more broadly) and improved performance on creativity tasks unrelated to social domains.

## Study 1: Multiracials Versus Monoracials and Racial Identity

### Method

Multiracial ( $N = 58$ ; 36 female,  $M_{\text{age}} = 22.91$ ,  $SD = 5.93$ ; 21 Asian/White, 10 Black/White, 6 Black/Hispanic, 21 other) and monoracial ( $N = 109$ ; 54 female;  $M_{\text{age}} = 19.43$ ,  $SD = 1.20$ ; 81 White, 15 Asian, 5 Black, 3 Hispanic, 2 Native American, 3 unknown) participants were recruited through a university participant pool and online postings.<sup>1</sup> The participants first completed demographic questions (gender, age, religion, and race). The race question asked participants to select their race by checking all that may apply (White, Black, Asian, Hispanic, Multiracial, and other—please specify). All multiracials

selected the multiracial box and all but 11 multiracials specified what type of multiracial they identified as by checking additional boxes. Next, participants responded to one of the following prompts: *Race Prime*—"Based on your response to the race question above, please write one paragraph about your racial identity, what it means to you, experiences you may have had, etc."; *Control*—"Please write one paragraph about your average day, things you typically do, places you go, etc."

Next, using methods directly adapted from Tadmor, Chao, Hong, and Polzer (2013), participants completed the Remote Associates Test (RAT; Mednick, 1962) that measures participants' convergent thinking abilities by asking them to form associations between three words by thinking specifically of a fourth related word (e.g., given the words "paint," "doll," and "cat," the target would be "house"). Since the RAT depends on considering possible relationships between the given words by deciding on a common denominator, this task uses relational processing (IJzerman, Leung, & Ong, 2014; Kray, Galinsky, & Wong, 2006). Participants saw two examples and answered six problems. Finally, to measure one's ability to overcome functional fixedness (i.e., thinking in fixed ways about an object's function), participants completed the Duncker (1945) candle problem that measures counterfactual thinking abilities. This task asks participants to figure out a way, using only a book of matches and a box of tacks, to affix a candle to the wall so it will not drip onto the table. To succeed, participants must use insight abilities to see the answer by looking beyond preexisting uses for each object until the correct answer is reached (see Tadmor et al., 2013, for similar methods). Since the RAT and candle tasks have specific correct answers, both tasks measure convergent thinking.

## Results and Discussion

There was a significant interaction between participant race and condition for RAT problems solved,  $F(1, 163) = 4.67$ ,  $p = .032$ ,  $\eta_p^2 = .03$ . Planned contrasts revealed that multiracials primed with their racial identity solved more RAT problems than nonprimed multiracials,  $t(56) = 2.25$ ,  $p = .028$ ,  $r = .29$ , but monoracials did not differ in RAT scores across priming conditions,  $t(107) = .56$ ,  $p = .57$  (see Table 1 for means). Results from a binary logistic regression showed that there was no interaction effect ( $b = -.10$ ,  $SE = 0.66$ , Wald = .02,  $p = .88$ ) or main effect for either racial group membership ( $b = -.46$ ,  $SE = 0.46$ , Wald = 1.01,  $p = .32$ ) or priming condition ( $b = .29$ ,  $SE = 0.54$ , Wald = .28,  $p = .59$ ) on candle task performance (see Table 1 for percentages).

These results highlight that racial priming caused multiracials (but not monoracials) to solve more RAT problems, a creativity task unrelated to race. Although Tadmor and colleagues (2013) found that priming essentialism affected performance on the candle task, we did not find any differences. Both the candle task and the RAT are measuring convergent thinking, however, the RAT is centered around relational processing when considering multiple words at a given moment,

**Table 1.** Study 1 Outcomes for Multiracial and Monoracial Participants by Priming Condition.

Measure	Multiracials		Monoracials	
	Race Primed	Control	Race Primed	Control
Number of RAT solved	2.07 (1.19) <sup>a</sup>	1.41 (1.02)	1.40 (1.01)	1.52 (1.18)
Candle solved percentage	55.17	62.07	42.49	47.06

Note. Standard deviations are in parentheses.

<sup>a</sup>Denotes only race-primed multiracials differed from other conditions,  $p < .05$ .

suggesting racial identity priming may specifically affect relational creative thinking.

We argue these results demonstrate that the malleable nature of multiracial identification can also translate into more flexible thought processes in nonsocial domains. Importantly, there was no main effect on RAT performance by participant demographic; multiracials were not *always* more creative than monoracials, but rather only outperformed them after racial priming. These results also show that racial priming outcomes are not always negative and that they can differ for multiracials—although reminding monoracial minorities about their race causes decrements in academic outcomes (e.g., Aronson et al., 1998), reminding multiracials that they are multiracial does not show the same stereotype threat effects (Shih, Bonam, Sanchez, & Peck, 2007).

However, in comparison to priming a multiracial identity mind-set, which activates multiple racial backgrounds simultaneously, priming a monoracial identity is actually more similar to priming a singular identity. So, would priming a multiple social identity mind-set for monoracial individuals also lead to similar boosts in creativity? This question is explored in Study 2.

## Study 2: Monoracials and Priming Multiple Identities

### Method

Monoracial ( $N = 57$ ; 36 female,  $M_{\text{age}} = 18.61$ ,  $SD = 1.41$ ; 32 White, 16 Asian, 3 Black, 5 Hispanic, 1 Middle Eastern) participants were recruited through a university participant pool. Participants were randomly assigned to respond to one of the following prompts: *Multiple Identities Prime*—“Please write a few sentences about all of the different identities that you have (i.e., social identities, gender, race, family identities, group identities, etc.). Write about how these multiple identities overlap and affect your life and what they mean to you.”; *Control*: “Please write one paragraph about your average day, things you typically do, places you go, etc.” To isolate the same domains of creativity, participants completed the same RAT and candle tasks as in Study 1 (see Tadmor et al., 2013). But because the candle task yielded null results in Study

1, and because both the candle task and the RAT measure convergent thinking, participants in Study 2 completed a pasta-naming task to measure divergent thinking. Participants read five examples of pasta names that all ended with the letter “i” and were asked to come up with five new names of pasta. Because participants were never explicitly told that they needed to use any of the features shown in the example pasta names, creative thinking was measured by counting the number of new pasta names that did not end with *i* (see Dijksterhuis & Meurs, 2006; Gocłowska, Crisp, & Labuschagne, 2013; Rubin, Stoltzfus, & Wall, 1991, for similar methods). Therefore, despite the fact that the RAT and the pasta naming task measure different forms of creative thinking, the generation of new pasta names while still considering existing pasta names also involves relational processing like that of the RAT, linking these two creativity measurements more than with the candle task (Galinsky & Moskowitz, 2000). Finally, as a manipulation check for the prime, at the end of the study, all participants were asked to simply list the identities that they have and the number of identities self-reported was totaled. We expected participants in the multiple identities condition to self-report more identities than those in the control condition.

## Results and Discussion

Regarding the manipulation check, participants primed with multiple identities self-reported significantly more identities than participants in the control condition (who also listed their identities at the end of the experiment),  $t(50) = 2.37$ ,  $p = .022$ ,  $r = .32$ , demonstrating that the priming manipulation was successful (see Table 2 for means). However, as in Study 1, no significant differences emerged by priming condition for candle task performance:  $\chi^2(1, N = 57) = 2.46$ ,  $p = .12$  (see Table 2 for percentages). But as expected, monoracials primed with having multiple identities solved significantly more RAT problems than monoracials in the control condition,  $t(55) = 2.18$ ,  $p = .033$ ,  $r = .28$ , demonstrating that priming multiple identities aids in flexible thinking abilities for monoracials. Participants primed with having multiple identities also generated more pasta names not ending with *i*,  $t(55) = 2.29$ ,  $p = .026$ ,  $r = .28$ . Furthermore, there was a significant and positive correlation between the number of identities listed in the manipulation check and the number of RAT problems solved ( $r = .28$ ,  $p = .04$ ) and the number of pasta names not ending with *i* ( $r = .34$ ,  $p = .01$ ), but no correlation with the candle task ( $r = .06$ ,  $p = .67$ ).

These results extend Study 1 by demonstrating that thinking about multiple identities also helps monoracials on creative thinking tasks. Thus, creativity boosts associated with thinking about social identities flexibly are not limited to individuals (e.g., bicultural and multiracial) who have inherently fluid identities. Study 1 instructed monoracial participants to write about their monoracial, or singular racial identity, and no increase in creativity was seen. However, Study 2 shows that asking monoracial participants to think about how they too have multiple social identities increased performance on both

**Table 2.** Studies 2 and 3 Outcomes for Participants by Priming Condition.

Measure	Multiple Identities Prime	Control	
<b>Study 2</b>			
Number of RAT solved	1.75 (.79)*	1.25 (.97)	
Candle solved percentage	55.2%	75.0%	
Pasta names not ending in “i”	1.55 (1.52)**	.75 (1.08)	
Number of self-reported identities	6.22 (2.14)**	4.68 (2.56)	
Measure	Multiple Identities Prime	Multiracial Prime	Control
<b>Study 3</b>			
Number of RAT solved	1.74 (1.15)*	1.21 (.93)	1.13 (.84)
Pasta names not ending in “i”	1.74 (1.69)*	1.00 (1.06)	.97 (1.20)
Number of self-reported identities	6.43 (2.65)*	4.69 (2.24)	4.75 (3.04)

Note. Standard deviations are in parentheses. Study 3 results compare the Multiple Identities Prime to the other conditions.

\* $p < .04$ . \*\* $p < .03$ .

the RAT and the pasta naming task—two distinct creative problem-solving tasks involving relational thinking measured in different ways. These results highlight that the flexibility associated with multiple racial identities extends to having multiple social identities more broadly for monoracials, which translates into the same creativity gains in nonsocial domains.

Additionally, like Study 1, Study 2 also found null results for the candle task, which was used in an earlier study examining fixed beliefs and creativity (Tadmor et al., 2013). This suggests that priming essentialist thinking may have different effects on different types of creativity than priming a racially flexible or flexible identity mind-set. In fact, the number of multiple identities listed correlated with both the RAT and pasta naming tasks, but not with the candle task, providing further support that the candle task may be distinct compared to these other tasks—at least as it relates to multiple identity priming. Furthermore, the candle task is considered an insight problem with an outcome focusing on one’s ability to suppress preexisting assumptions about the box’s use, since without that ability the correct answer cannot be found (Maddux & Galinsky, 2009; Schooler & Melcher, 1995). Alternatively, the RAT and the pasta naming tasks are both considered to measure participants’ ability to create new associations between ideas by using relational processing, because the cues given in the prompts are known to activate close associates as possible answers, targeting flexible thinking more than the fixed dichotomous outcome for the candle task (IJzerman et al., 2014; Mednick, 1962; Topolinski & Strack, 2008). Although additional research is needed to further define the various uses of these different creativity tasks, it is clear that the candle task

does differ in some distinct ways in comparison to both the RAT and pasta naming tasks. Future research should examine the boundary effects of these results while also outlining what types of creative thinking may or may not be affected based on different contexts and priming tasks.

One could argue that priming a multiracial or multiple identities mind-set is merely priming participants to think from different perspectives, which in turn boosts creativity. If that were true, monoracials primed to think as if they too were multiracial should also show positive gains in creativity. However, if the primed identity really does need to be personally relevant to be influential, then priming a multiracial identity for someone who does not identify that way should not affect creativity. In fact, some recent research suggests that thinking about the inconsistencies of different individuals boosts creative thinking abilities (e.g., Gocłowska et al., 2013; Huang & Galinsky, 2010; Miron-Spektor, Gino, & Argote, 2011; Wan & Chiu, 2002), but these outcomes depend on a need for structure and relevancy to the self (Gocłowska, Baas, Crisp, & De Dreu, 2014; Gocłowska & Crisp, 2013; Nijstad et al., 2010; Ritter et al., 2012). Relatedly, social group identification is an important component of the self from which the individual derives an important sense of belonging (Correll & Park, 2005; Tajfel & Turner, 1986). Therefore, we predict that priming a multiracial identity for a monoracial individual should not affect creativity because the identity is not reflective of a monoracial person’s sense of self. Study 3 examines this hypothesis.

### Study 3: Monoracials and Priming Multiple Versus Multiracial Identities

#### Method

Monoracial ( $N = 95$ ; 45 female,  $M_{\text{age}} = 19.24$ ,  $SD = 1.37$ ; 63 White, 20 Asian, 6 Black, 6 Hispanic) participants were recruited through a university participant pool. Methods were similar to Study 2, except that in addition to being randomly assigned to either a *Multiple Identities Prime* or a *Control* condition, a third condition was added, that is, *Multiracial Identity Prime*. In this condition, participants responded to the following prompt: “Based on ancestry patterns over time, research shows that the majority of the population is now considered multiracial or mixed-race even if one’s parents are both the same racial background. Therefore, we would like you to write a few sentences about having a multiracial identity and what it means to you and how being multiracial and having multiple social identities affect your life. Please write about what your life would be like as a multiracial person, having flexible racial identities.” Because the candle task did not yield significant results in the previous two studies, that task was excluded from Study 3. After responding to the prompt, participants completed the same RAT and pasta naming tasks as in Study 2. Finally, as a manipulation check for the prime, participants were asked to list the identities that they have and the number of self-reported identities were summed.

## Results and Discussion

Regarding the manipulation check, there was a main effect of condition on the number of identities listed,  $F(2, 74) = 3.69$ ,  $p = .03$ ,  $\eta_p^2 = .09$ .<sup>2</sup> Planned contrasts showed that multiple-identities-primed participants self-reported significantly more identities than both multiracial-primed participants,  $t(71) = 2.43$ ,  $p = .018$ ,  $r = .28$ , and control participants,  $t(71) = 2.18$ ,  $p = .032$ ,  $r = .25$ . Multiracial primed and control participants did not differ on the number of identities listed,  $t(71) = .07$ ,  $p = .94$ , demonstrating that the priming manipulation was successful (see Table 2 for means).

Regarding the number of RAT problems solved, there was a significant effect of condition,  $F(2, 92) = 3.45$ ,  $p = .032$ ,  $\eta_p^2 = .07$ . Planned contrasts revealed that multiple-identities-primed monoracials solved significantly more RAT problems than both multiracial-primed monoracials,  $t(92) = 2.15$ ,  $p = .034$ ,  $r = .22$ , and control participants,  $t(92) = 2.45$ ,  $p = .016$ ,  $r = .25$ . RAT scores did not differ between multiracial-primed and control participants,  $t(92) = .34$ ,  $p = .74$ . There was also a significant effect of condition on the number of pasta names reported not ending with the letter *i*,  $F(2, 92) = 3.35$ ,  $p = .039$ ,  $\eta_p^2 = .07$ . Planned contrasts showed that multiple-identities-primed monoracials created significantly more pasta names not ending in *i* than both multiracial-primed monoracials,  $t(92) = 2.22$ ,  $p = .029$ ,  $r = .23$ , and control participants,  $t(92) = 2.28$ ,  $p = .025$ ,  $r = .23$ . Pasta naming scores did not differ between multiracial-primed and control participants,  $t(92) = .09$ ,  $p = .92$  (see Table 2 for means). However, unlike Study 2, there were no correlations between the number of identities listed in the manipulation check and the number of RAT problems solved ( $r = .04$ ,  $p = .71$ ) or the number of pasta names not ending with *i* ( $r = .18$ ,  $p = .12$ ).

These results support our hypothesis that the mind-set activated for an individual needs to be one with which that individual can identify. We show that reminding monoracials that they have multiple social identities enhances cognitive performance on both the RAT and pasta naming tasks. However, reminding monoracials that they have multiracial ancestry does not produce similar effects. This was expected since other research has found the category “multiracial” to be cognitively inaccessible to many monoracials (Chen & Hamilton, 2012). However, other research has shown that when a particular mind-set is activated, that mind-set or perspective can transfer to influence new contexts (e.g., De Dreu, Baas, & Nijstad, 2008; Maddux & Galinsky, 2009; Markman, Lindberg, Kray, & Galinsky, 2007). In contrast, our results highlight that there are clear boundary effects for those outcomes.

Moreover, although past work shows that recalling multicultural or diverse experiences primes a more flexible mind-set (Maddux, Adam, & Galinsky, 2010; Maddux & Galinsky, 2009), we show here that specifically priming a multiracial mind-set for a monoracial individual does not result in enhanced creativity. Therefore, this suggests that creativity gains may only be seen when the mind-set or perspective primed is one with which an individual can directly identify.

This supports past work linking highly integrated identities with increases in creativity (Cheng et al., 2008), but extends that work by highlighting how priming multiple identities more broadly also boosts creativity. We believe much like having highly integrated identities, priming a multiple identity mind-set also activates access to multiple resources or perspectives, which influences both convergent and divergent thinking. Ritter and colleagues (2012) also demonstrated that creativity gains are only seen when participants are primed with a mind-set that is highly self-relevant. However, they link creativity gains with inconsistency priming or priming a sense of a unique experience. This work extends those results by illustrating that priming actual self-relevant social identities also leads to creativity gains, since thinking from a multiple identity mind-set could be considered to be thinking from a perspective inconsistent with normal thinking abilities. However, this parallel outcome is in need of future study to see whether both integrated identities and inconsistent experiences lead toward similar gains in creativity.

Moreover, because Study 3 did not replicate Study 2’s findings linking the number of multiple identities listed at the end of the study with RAT and pasta naming performance, this suggests that although the prime itself led to similar outcomes, it may not be the number of identities that a person thinks of that leads to boosts in creativity. Instead, creativity may be associated with how flexible a person thinks those multiple identities are. Alternatively, creativity could be associated with how identified a person may be with the identities activated, or a combination of these factors may also underlie these results. It is clear that additional research is needed to pinpoint the process linking multiple identity mind-sets to creativity, since the present results suggest that pathway may be multifaceted and context dependent.

## General Discussion

In this research, we found evidence that priming multiple, flexible social identities for both multiracial and monoracial individuals can generate flexible creative thinking abilities, boosting creativity on different cognitive tasks in domains unrelated to social identity. Study 1 showed that multiracials primed with their flexible multiracial identity performed significantly better on an RAT than nonprimed multiracials or monoracials primed with their singular racial identity. Study 2 demonstrated that priming flexible multiple identities more generally positively affected monoracials’ abilities on the same RAT and an additional pasta naming task, both measuring flexible thinking. Study 3 revealed that only priming a self-relevant multiple identity mind-set boosted creativity. In sum, these results suggest that activating a multiple identity mind-set with which one can identify can positively affect creativity in non-social domains.

These findings are supported by past work highlighting that thinking from multiple perspectives aids in flexible thinking (e.g., Benet-Martinez, Lee, & Leu, 2006; Cheng et al., 2008;

Maddux & Galinsky, 2009; Tadmor, Tetlock, & Peng, 2009). But the present studies extend that work not by focusing on having diverse perspectives from life experiences (i.e., living abroad), but rather by examining the link between a fixed view of one's racial or social identities and the initiation of creativity. Moreover, although bicultural individuals have been studied within this framework (e.g., Benet-Martinez et al., 2006; Tadmor et al., 2009), this is the first research to date to examine this question through a multiracial lens, pinpointing tangible differences between multiracial and monoracial populations regarding the intersection between their racial identities and creativity—a group comparison seldom made in research to date (Gaither, in press).

An important future question is whether thinking about multiple identities more generally would also produce similar gains in creativity. For example, would asking a monoracial person to think about the identities of another multiracial individual boost creativity as well, or is a direct link to one's own identity required? Additionally, because some bilingual research has shown creativity boosts without explicit priming (see Bialystok & Craik, 2010, for a review), future work could also compare groups with established dual identities (i.e., bilingual, biracial, and bicultural) to other groups with more prominent singular identities (i.e., monolingual, monoracial, and monocultural) to examine whether priming different multiple identity mind-sets may show even more pronounced creativity boosts in some groups over others. We show that priming a self-relevant multiple identity mind-set shows boosts in creativity, but some individuals may have more everyday experiences navigating between their multiple identities, making that multiple identity mind-set more cognitively accessible. Furthermore, our participant sample also did not allow for statistical comparisons of possible subgroup differences among multiracials or monoracial minorities, so it is unclear whether various racial backgrounds respond to racial identity priming differently. Finally, there are many other creativity measurements not utilized in the present studies, meaning our results highlight merely one pathway to more flexible thinking outcomes. Therefore, it is clear that additional work is needed to identify the exact process behind multiple identity mind-sets in order to create a more unified theory surrounding flexible thinking abilities. This work should examine whether the types of multiple identities people think of moderate flexible thinking abilities and which tasks provide the best measurements (see Runco, 2007). However, given that everyone has multiple social identities, the present findings still highlight promising steps for increasing creativity in the general population by reframing views of the self.

Psychologists are beginning to show an increased interest in the cognitive and social tendencies linked to having multiple social identities. The current findings are the first to identify a link between having multiple, flexible social identities with a cognitive outcome: creativity. Although past work has examined links between bicultural identity and creativity, we extended these findings by showing that priming racial identity in multiracial people leads to more versatile thinking. We also

showed that priming multiple social identities in general causes boosts in convergent and divergent creative thinking. Researchers need to identify whether these effects are seen in other real-world domains that need flexible thinking such as job interview performance, negotiations, decision making, and management success (e.g., Ford & Gioia, 2000; Nemeth, 1995; Pruitt & Lewis, 1975; Tadmor et al., 2012). We show that something as simple as thinking about the multiple social identities a person has could serve as an intervention to get people to “think outside the box.” These findings therefore add to a growing literature regarding both multiracial identification and flexible social identification more broadly and how they relate to cognition and behavior—questions that will only continue to gain in importance given the demographic trajectory of contemporary society.

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### Notes

1. Four monoracial and two multiracial participants ( $n = 2$  experimenter error,  $n = 4$  used cell phone to text or check e-mail during priming) were excluded ( $N = 173$ ).
2. Some participants skipped this question resulting in fewer degrees of freedom.

### References

- Aronson, J., Steele, C. M., Salinas, M. F., & Lustina, M. J. (1998). The effects of stereotype threat on the standardized test performance of college students. In E. Aronson (Ed.), *Readings about the social animal* (8th ed., pp. 415–430). New York, NY: Freeman.
- Benet-Martinez, V., Lee, F., & Leu, J. (2006). Biculturalism and cognitive complexity: Expertise in cultural representations. *Journal of Cross-Cultural Psychology, 37*, 386–407. doi:10.1177/0022022106288476
- Bialystok, E., & Craik, F. I. (2010). Cognitive and linguistic processing in the bilingual mind. *Current Directions in Psychological Science, 19*, 19–23. doi:10.1177/0963721409358571
- Chen, J. M., & Hamilton, D. L. (2012). Natural ambiguities: Racial categorization of multiracial individuals. *Journal of Experimental Social Psychology, 48*, 152–164. doi:10.1016/j.jesp.2011.10.005
- Cheng, C.-Y., Sanchez-Burks, J., & Lee, F. (2008). Connecting the dots within: Creative performance and identity integration.

- Psychological Science*, 19, 1178–1184. doi:10.1111/j.1467-9280.2008.02220.x
- Chiao, J. Y., Heck, H. E., Nakayama, K., & Ambady, N. (2006). Priming race in biracial observers affects visual search for black and white faces. *Psychological Science*, 17, 387–392. doi:10.1111/j.1467-9280.2006.01717.x
- Correll, J., & Park, B. (2005). A model of the ingroup as a social resource. *Personality & Social Psychology Review*, 9, 341–359. doi:10.1207/s15327957pspr09044
- De Dreu, C. K. W., Baas, M., & Nijstad, B. A. (2008). Hedonic tone and activation in the mood—creativity link: Towards a dual pathway to creativity model. *Journal of Personality and Social Psychology*, 94, 739–756. doi:10.1037/0022-3514.94.5.739
- Dijksterhuis, A., & Meurs, T. (2006). Where creativity resides: The generative power of unconscious thought. *Consciousness and Cognition*, 15, 135–146. doi:10.1016/j.concog.2005.04.007
- Duncker, K. (1945). On problem solving (L. S. Lees, Trans.). *Psychological Monographs*, 58, (5, Whole No. 270).
- Ford, C. M., & Gioia, D. A. (2000). Factors influencing creativity in the domain of managerial decision making. *Journal of Management*, 26, 705–732. doi:10.1177/014920630002600406
- Gaither, S. E. (in press). “Mixed” results: Multiracial research and identity explorations. *Current Directions in Psychological Science*.
- Gaither, S. E., Sommers, S. R., & Ambady, N. (2013). When the half affects the whole: Priming identity for biracial individuals in social interactions. *Journal of Experimental Social Psychology*, 49, 368–371. doi:10.1016/j.jesp.2012.12.012
- Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: Decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology*, 78, 708–724. doi:10.1037/0022-3514.78.4.708
- Gocłowska, M. A., Baas, M., Crisp, R. J., & De Dreu, C. K. W. (2014). Whether social schema violations help or hurt creativity depends on need for structure. *Personality and Social Psychology Bulletin*, 8, 959–971. doi:10.1177/0146167214533132
- Gocłowska, M. A., & Crisp, R. J. (2013). On counter-stereotypes and creative cognition: When interventions for reducing prejudice can boost divergent thinking. *Thinking Skills and Creativity*, 8, 72–79. doi:10.1016/j.tsc.2012.07.001
- Gocłowska, M. A., Crisp, R. J., & Labuschangne, K. (2013). Can counter-stereotypes boost flexible thinking? *Group Processes & Intergroup Relations*, 16, 217–231. doi:10.1177/1368430212445076
- Huang, L., & Galinsky, A. D. (2010). Mind-body dissonance: Conflict between the senses expands the mind’s horizons. *Social Psychological and Personality Science*, 2, 351–359. doi:10.1177/1948550610391677
- IJzerman, H., Leung, A. K. Y., & Ong, L. S. (2014). Perceptual symbols of creativity: Coldness elicits referential, warmth elicits relational creativity. *Acta psychologica*, 148, 136–147. doi:10.1016/j.actpsy.2014.01.013
- Kray, L. J., Galinsky, A. D., & Wong, E. M. (2006). Thinking within the box: The relational processing style elicited by counterfactual mind-sets. *Journal of Personality and Social Psychology*, 91, 33–48. doi:10.1037/0022-3514.91.1.33
- Lickel, B., Hamilton, D. L., Wierzchowska, G., Lewis, A., Sherman, S. J., & Uhles, A. N. (2000). Varieties of groups and the perception of group entitativity. *Journal of Personality and Social Psychology*, 78, 223–246. doi:10.1037/0022-3514.78.2.223
- Linville, P. W. (1985). Self-complexity and affective extremity: Don’t put all of your eggs in one cognitive basket. *Social Cognition*, 3, 94–120. doi:10.1521/soco.1985.3.1.94
- Linville, P. W. (1987). Self-complexity as a cognitive buffer against stress-related illness and depression. *Journal of Personality and Social Psychology*, 52, 663–676. doi:10.1037/0022-3514.52.4.663
- Maddux, W. W., Adam, H., & Galinsky, A. D. (2010). When in Rome . . . learn why the romans do what they do: How multicultural learning experiences facilitate creativity. *Personality and Social Psychology Bulletin*, 36, 731–741. doi:10.1177/0146167210367786
- Maddux, W. W., & Galinsky, A. D. (2009). Cultural borders and mental barriers: The relationship between living abroad and creativity. *Journal of Personality and Social Psychology*, 96, 1047–1061. doi:10.1037/a0014861
- Markman, K. D., Lindberg, M. J., Kray, L. J., & Galinsky, A. D. (2007). Implications of counterfactual structure for creative generation and analytical problem solving. *Personality and Social Psychology Bulletin*, 33, 312–324. doi:10.1177/0146167206296106
- McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*, 52, 1258–1265. doi:10.1037/0022-3514.52.6.1258
- Mednick, S. A. (1962). The associative basis of the creative process. *Psychological Review*, 69, 220–232. doi:10.1037/h0048850
- Miron-Spektor, E., Gino, F., & Argote, L. (2011). Paradoxical frames and creative sparks: Enhancing individual creativity through conflict and integration. *Organizational Behavior and Human Decision Processes*, 116, 229–240. doi:10.1016/j.obhdp.2011.03.006
- Nemeth, C. J. (1995). Dissent as driving cognition, attitudes, and judgments. *Social Cognition*, 13, 273–291. doi:10.1521/soco.1995.13.3.273
- Nijstad, B. A., De Dreu, C. K. W., Rietzschel, E. F., & Baas, M. (2010). The dual pathway to creativity model: Creative ideation as a function of flexibility and persistence. *European Review of Social Psychology*, 21, 34–77. doi:10.1080/10463281003765323
- Pauker, K., Ambady, N., & Freeman, J. B. (2013). The power of identity to motivate face memory in biracial individuals. *Social Cognition*, 31, 780–791. doi:10.1521/soco.2013.31.6.780
- Pruitt, D. G., & Lewis, S. A. (1975). Development of integrative solutions in bilateral negotiations. *Journal of Personality and Social Psychology*, 31, 621–633. doi:10.1037/0022-3514.31.4.621
- Ritter, S. M., Damian, R. I., Simonton, D. K., Van Baaren, R. B., Strick, M., Derks, J., & Dijksterhuis, A. (2012). Diversifying experiences enhance cognitive flexibility. *Journal of Experimental Social Psychology*, 48, 961–964. doi:10.1016/j.jesp.2012.02.009
- Roccas, S., & Brewer, M. B. (2002). Social identity complexity. *Personality and Social Psychology Review*, 6, 88–106. doi:10.1207/S15327957PSPR060201
- Rockquemore, K. A., Brunnsma, D. L., & Delgado, D. J. (2009). Racing to theory or retheorizing race? Understanding the struggle

- to build a multiracial identity theory. *Journal of Social Issues*, 65, 13–34. doi:10.1111/j.1540-4560.2008.01585.x
- Rubin, D. C., Stoltzfus, E. R., & Wall, K. L. (1991). The abstraction of form in semantic categories. *Memory & Cognition*, 19, 1–7. doi:10.3758/BF03198491
- Runco, M. A. (2007). *Creativity, theories and themes: Research, development, and practice*. San Diego, CA: Academic Press.
- Sassenberg, K., & Moskowitz, G. B. (2005). Don't stereotype, think different! Overcoming automatic stereotype activation by mindset priming. *Journal of Experimental Social Psychology*, 41, 506–514. doi:10.1016/j.jesp.2004.10.002
- Schooler, J. W., & Melcher, J. (1995). The ineffability of insight. In S. M. Smith, T. B. Ward, & R. A. Finke (Eds.), *The creative cognition approach* (pp. 97–133). Cambridge, MA: MIT Press.
- Shih, M., Bonam, C., Sanchez, D., & Peck, C. (2007). The social construction of race: Biracial identity and vulnerability to stereotypes. *Cultural Diversity and Ethnic Minority Psychology*, 13, 125–133. doi:10.1111/j.1540-4560.2008.01584.x
- Simonton, D. K. (1988). *Scientific genius: A psychology of science*. Cambridge, England: Cambridge University Press.
- Sligte, D. J., de Dreu, C. K. W., & Nijstad, B. A. (2011). Power, stability of power, and creativity. *Journal of Experimental Social Psychology*, 47, 891–897. doi:10.1016/j.jesp.2011.03.009
- Tadmor, C. T., Chao, M. M., Hong, Y. Y., & Polzer, J. T. (2013). Not just for stereotyping anymore: Racial essentialism reduces domain-general creativity. *Psychological Science*, 24, 99–105. doi:10.1177/0956797612452570
- Tadmor, C. T., Galinsky, A. D., & Maddux, W. W. (2012). Getting the most out of living abroad: Biculturalism and integrative complexity as key drivers of creative and professional success. *Journal of Personality and Social Psychology*, 103, 520–542. doi:10.1037/a0029360
- Tadmor, C. T., Tetlock, P. E., & Peng, K. (2009). Acculturation strategies and integrative complexity: The cognitive implications of biculturalism. *Journal of Cross-Cultural Psychology*, 40, 105–139. doi:10.1177/0022022108326279
- Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup conflict. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations*, (pp. 23–45). Mahwah, NJ: Erlbaum.
- Topolinski, S., & Strack, F. (2008). Where there's a will—there's no intuition: The unintentional basis of semantic coherence judgments. *Journal of Memory and Language*, 58, 1032–1048. doi:10.1016/j.jml.2008.01.002
- Wan, W. W. N., & Chiu, C. -Y. (2002). Effects of novel conceptual combination on creativity. *The Journal of Creative Behavior*, 36, 227–240. doi:10.1002/j.2162-6057.2002.tb01066.x
- Ward, T. B. (1994). Structured imagination: The role of category structure in exemplar generation. *Cognitive Psychology*, 27, 1–40. doi:10.1006/cogp.1994.1010

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