Culture and the Incidental Self- and Mother-Reference

Effect in Memory

by

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Abstract

Co-presenting an item with self-relevant vs. other-relevant information at encoding can produce a self-memory advantage in the absence of any task demand to process the item’s self-relevancy. The present study examined (a) whether this “incidental” self-memory advantage would extend beyond highly self-relevant information such as one’s own name to include information relevant to one’s family member, specifically one’s mother, and (b) if and to what extend individualistic vs. collectivist cultures differentially affect the magnitude of the potential mother-memory advantage. During encoding, American and Moroccan participants were presented their own name, their mother’s name, or another person’s name simultaneously with the to-be-processed target words to which they made location judgments in relation to the name in the middle. In a subsequent memory test, we found that both Moroccan and American participants showed a significant memory advantage for target words and their associated source feature (i.e., the name each word was presented with at encoding) that were presented with their own name or their mother’s name compared with those presented with another person’s name. There was no significant effect of culture on the magnitude of a mother-memory advantage. Our findings provide evidence for the presence of an incidental mother-reference effect and further suggest that future studies are necessary to fully determine the effect of culture on the emergence of this incidental mother-memory advantage.
Introduction

The self is a central feature of the human experience; its development and maintenance in part dictate human socio-cognitive functioning (James, 1890/1983). Much of the research on the role of the self in cognition has focused on its role in memory (for review, see Symons & Johnson, 1997). In particular, studies have found that processing information in relation to the self at encoding produces a distinct memory advantage termed the self-reference effect (SRE; Rogers, Kuiper & Kirker, 1977). The SRE has typically been observed in self-referencing paradigms in which individuals are explicitly asked to process some stimuli in relation to themselves and other stimuli in relation to another person. For example, the most widely used trait-evaluation task asks participants to judge whether a personality-trait word describes themselves or another person (often a familiar celebrity such as a politician or an actor/actress) at encoding, and at a later memory test, words judged in reference to oneself are better remembered than those judged in reference to another person (e.g., Conway & Dewhurst, 1995; Ferguson, Rule & Carlson, 1983; Kuiper & Rogers, 1979). There have been many attempts to determine why the SRE arises, with current understanding suggesting that using well-established, highly organized self-concept/knowledge at encoding allows enhanced elaboration and organization of incoming information (Conway & Dewhurst, 1995; Keenan & Baillet, 1980; Klein & Kihlstrom, 1986; Klein & Loftus, 1988).

With the demonstration of the SRE, previous research has examined if, and to what extent, a similar memory advantage might occur when information is processed in relation to those who are close to the self, such as one’s family members,
particularly one’s mother. For example, Bower and Gilligan (1979) asked participants, in response to a series of personality-trait words, to think of specific events in which either their behaviors (i.e., self-reference) or their mother’s behaviors (i.e., mother-reference) exemplified a given personality-trait. The results from a subsequent memory test demonstrated that participants showed similar recall rates for the trait words from the self-reference condition and those from the mother-reference condition, demonstrating similar levels of an SRE and a mother-reference effect (MRE). These findings suggest that both one’s self-concept and concept of their mother, as well-developed, organized knowledge structures, enhance elaboration and organization of incoming information (Bower & Gilligan, 1979).

The presence of MRE raises an interesting question of how conceptions of self in different cultures might differentially influence one’s ability to remember information relevant to oneself vs. close other. Ample evidence suggests individualistic cultures, such as those prevalent in the United States and other Western societies, value individuals over groups. In this manner, they tend to promote uniqueness, autonomy and separateness, leading to a conception of the self as an autonomous independent person (i.e., independent self-construal; Hofstede, 1980; 2001; Hofstede & Bond, 1984; Markus & Kitayama, 1991; Triandis, 1989). In contrast, collectivistic cultures, such as those prevalent in Eastern societies (especially in East Asian countries) as well as Latin American and African societies, value groups over the individual. In turn, they tend to promote interdependence, consensus and intimacy, leading to a conception of the self that encompasses interpersonal and social relationships (i.e., interdependent self-construal; Hofstede, 1980; 2001;
Given the differences in self-construal between individualistic and collectivistic cultures, past studies have examined how cultures affect the magnitudes of SRE and MRE. For example, Sui, Zhu and Chiu (2007) investigated the effects of the self-referential and mother-referential processing on memory among bilingual participants in China. Using a trait-evaluation task in which participants were asked to process personality-trait words in reference to themselves or their mother, Sui et al. found a significant effect of cultural priming on memory for personality-trait words encoded in reference to the self vs. those encoded in reference to one’s mother. Although both the American and Chinese priming conditions led to a better memory for self-referenced than mother-referenced trait words, the self-mother difference in memory was much smaller in the Chinese compared to American priming condition.

In a similar study also using cultural priming and a trait-evaluation task, Ng and Lai (2009) found that under Western priming bicultural Chinese participants’ memory was better for self-referenced than mother-referenced words whereas under Chinese priming their memory did not significantly differ for self-referenced vs. mother-referenced words. Taken together, these findings suggest that the type of self-construal (i.e., independent or interdependent) that is prevalent at any given moment can determine the relative memorial advantage for information encoded with reference to oneself vs. a close other.

Of importance for the current investigation, recent studies on the SRE have shown that explicit self-reflection or evaluative appraisal of self-relevance such as that required in an explicit self-referential task (i.e., trait-evaluation task) is not
necessary for the SRE to emerge (Cunningham, Turk, MacDonald & Macrae, 2008; Turk, Cunningham & Macrae, 2008; Van den Bos, Cunningham, Conway & Turk, 2010). For instance, Turk et al. (2008) demonstrated that simply presenting a target stimulus alongside a self-relevant cue under a non-self-referential encoding context can produce an SRE. In Turk et al. (2008), participants were asked to indicate whether a series of personality-trait words appeared above or below the cue presented in the middle of the screen. The cue was either self-relevant (i.e., one’s own name or face) or other-relevant (name or face of another person). In a subsequent memory test, participants had better memory for words presented with the self-relevant cue than those presented with the other-relevant cue. This form of “incidental” SRE has been replicated in recent studies (Cunningham, Brebner, Quinn & Turk, 2014; Kim, Johnson, Rothschild, & Johnson, 2018; Kim, Jeon, Banquer, & Rothschild, 2019) for both target items themselves (i.e., item memory) and contextual features associated with the target items (i.e., source memory, Johnson, Hastroudi & Lindsay, 1993). The incidental SRE has been suggested to arise because self-relevant information automatically draws attention (e.g., Bargh, 1982; Gray, Ambady, Lowenthal & Deldin, 2004; Moray, 1959), which in turn promotes enhanced encoding of stimuli co-occurring with the self-relevant cues in the environment (Cunningham et al., 2014; Turk et al., 2008; Turk et al., 2011).

Notably, to our knowledge, the MRE has only been demonstrated under conditions in which the participants were explicitly asked to refer to-be-remembered information to their mother. Therefore, it is unknown if, and the extent to which a simultaneous presentation of target words with a mother-relevant cue (e.g., the name
of one’s mother) under an incidental, non-referral encoding context influences subsequent memory for the target words. As such the questions arise: Is explicit, evaluative reference to one’s mother at encoding necessary for the emergence of the MRE, or is a mere incidental association between to-be-remembered information and one’s mother under a non-referral encoding context sufficient to produce the MRE? If an incidental MRE can occur, does culture affect its presence and/or magnitude?

The present study aimed to address these questions using participants from individualistic and collectivistic cultures and a modified version of Turk et al.’s (2008) design. Specifically, we recruited American and Moroccan participants based on existing findings suggesting relatively individualistic vs. collectivistic values in these cultures (e.g., Balambo, 2014; Hofstede, 1980; 2001; Hofstede & Bond, 1984; Markus & Kitayama, 1991; Mone, Benga, & Opre, 2016; Oumlil & Balloun, 2009; Triandis, 1989; Veltri, Krasnova, & El Garah, 2011). Participants were presented with a series of personality-trait words appearing either above or below a centrally presented cue. This cue was either self-relevant (the participant’s own name), mother relevant (the name of the participant’s mother), or other-relevant (someone else’s name). The participants’ task was to make a location judgment to each target word (“Is the word above or below the name in the middle?”). Participants’ item and source memory for the target words were probed in a subsequent surprise memory test.

Based on previous literature on the incidental SRE (Cunningham et al., 2014; Kim et al., 2018; 2019; Turk et al., 2008) and the presence of the explicit, evaluative SRE under both individualistic and collectivistic cultural contexts (Sui et al., 2007),
we hypothesized that the incidental SRE would emerge for both item and source memory regardless of cultural leanings. Specifically, we expected to find better memory for target words and their associated contextual feature (i.e., the name each word was presented with) when the words were presented with self-relevant cues compared to when they were presented with other-relevant cues. We also predicted that the incidental MRE in both item and source memory would emerge to the extent that the mother-relevant cue attracts preferential attention compared to the other-relevant cue (e.g., Gronau, Cohen, & Ben-Shakhar, 2003), regardless of cultural leanings. Importantly, to the extent that relative amount of attention attracted by the mother-relevant cue is affected by cultures with potentially greater attention in collectivistic compared to individualistic cultures, we predicted that the magnitude of the MRE would be attenuated in American participants compared to that found in Moroccan participants.

Method

Participants and Design

Thirty-five undergraduate students at a Moroccan university (22 females; mean age = 20.49 [±2.97]) and thirty-five undergraduate students (22 females; mean age = 18.51 [±0.95]) at an American university participated in this study. The sample size for each cultural group was predetermined based on a medium effect size (e.g., Kim et al., 2018; 2019) using G*Power (f = .25, a = .05, power = .08). All Moroccan participants were native speakers of Arabic, particularly a local dialect (i.e., Darija), and all American participants were native speakers of English. The Moroccan participants were not compensated for their participants, and the American
participants received either course credit or payment in return for their participation. All participants provided written informed consent in accordance with the human subject regulations of Wesleyan University. Two additional American participants were excluded from analyses due to experimenter error.

We used a 2 (Culture: Moroccan or American) x 3 (Name Identity: Self-name, Mother-name, or Other-name) mixed factorial design with Name Identity as a within-subjects factor.

Materials and Stimuli

Singelis Self-Construal Scale (Singelis, 1994). This scale consists of two 15-item subscales, accessing an individual’s independent and interdependent self-construals, respectively. Example items from these subscales include “I do my own thing, regardless of what others think” (independent self-construal) and “I will sacrifice my self-interest for the benefit of the group I am in” (interdependent self-construal). Responses are made on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree). Responses to each subscale are summed and then divided by the total number of items (i.e., 15) to give the mean score of the items. Each participant thus receives two scores: one for the strength of the independent self-construal and the other for the interdependent self-construal.

Word Stimuli. A total of 128 personality-trait words taken from Anderson (1968) were used. For Moroccan participants, these words were translated into Modern Standard Arabic, also called Fus’ha, and were rated for their likeability and meaningfulness in a pilot study with independent group of eight Moroccan participants. For both English and Arabic-translated words, the 128 words were
divided into four lists of 32 words each that were matched for word length, syllable length, likeability and meaningfulness. Three lists served as critical “old” items that were presented in the encoding phase. The assignment of critical lists to Self, Mother or Other-Referent condition was counterbalanced across participants. A random half of the critical words in each Referent condition were presented at the top of the screen, and the other half were presented at the bottom of the screen. The remaining list served as “new” items and appeared only in the subsequent memory test.

**Name stimuli.** The name stimuli consisted of each participant’s own full name, their mother’s full name and the name of a gender-congruent familiar country-specific celebrity (for the Moroccan group, Rachid Allali or Dounia Batma; for the American group, Hugh Jackman or Angelina Jolie). For the Moroccan group, all names were written in Modern Standard Arabic, and for the American group all were written in English.

**Procedure**

The experiment consisted of the following four phases: Pre-experimental questionnaires, encoding, memory test, and post-experimental questionnaires.

**Pre-Experimental Questionnaires.** Participants filled out a pre-experimental questionnaire in which they provided their full names as well as that of their mother, to be used in the later sections of the study. They then filled out the Singelis Self-Construal Scale (Singelis 1994) which was used as a check of individual’s leanings on the individualistic/collectivistic spectrum.

**Encoding Phase.** Figure 1 depicts the schematic view of a trial sequence. Note that the words and names were presented in Modern Standard Arabic for
Moroccan participants. Each trial began with a 500-ms fixation cross that was followed by a name (each participant’s own name, their mother’s name, or the name of a gender-congruent familiar celebrity) presented in the center of the screen in black upper-case letters (48-point Palatino font). Five-hundred milliseconds after the onset of the name, a target word presented for 2s either above or below the name in red lower-case letters (48-point Arial font). The participants performed a location judgment task in which they indicated whether each word appeared above or below the immediately preceding name by a button press. The 32 Self, 32 Mother and 32 Other-Referent trials were randomly intermixed.

**Memory Test.** Immediately following the encoding phase, participants took a surprise memory test. The 96 old words from the encoding phase along with 32 new words were presented individually in the center of the screen in black lower-case letters (48-point Arial font) in a random order. For each word, participants were asked to first indicate whether or not they had seen the word in the preceding phase (old/new recognition). If participants responded that a word was “Old,” they were further asked to indicate who’s name the word was presented with in the preceding phase (their own, their mother’s or the celebrity’s). For both old/new and name memory judgments, participants had to respond within 4 s.

**Post-Experimental Questionnaires.** After the experiment, participants completed a post-experimental questionnaire that assessed their awareness of the experimental hypothesis and whether they anticipated a memory test.
Results

Singelis Self-Construal Scale

Table 1 shows mean scores and standard deviations of independent self-construal, interdependent self-construal, and the difference between them (independent self-construal minus independent self-construal). Independent samples $t$-tests revealed that Moroccan and American participants did not significantly differ in their scores on independent self-construal, $t(68) = .93, p > .3$, and on interdependent self-construal, $t(68) = .63, p > .5$. The difference scores also did not significantly differ between Moroccan and American participants, $t(68) = .09, p > .9$. The difference scores were significantly above zero for both Moroccan participants, $t(34) = 3.11, p = .004$, and American participants, $t(34) = 2.74, p = .010$, suggesting that both participant groups had stronger sense of independent self than interdependent self.

Item Memory

Participants’ hit rates and false-alarm rates were calculated by computing the proportion of “old” words correctly recognized as old and the proportion of “new” words incorrectly identified as old (Table 2). The corrected hit rates were calculated by subtracting the false-alarm rates from the hit rates and were submitted to a 2 (Culture: Moroccan or American) x 2 (Name Identity: Self-name, Mother-name, or Other-name) mixed-model analysis of variance (ANOVA). There was no significant main effect of Culture, $F(1, 68) = .043, p > .8$, but a significant main effect of Name Identity, $F(2, 136) = 14.83, p < .001, \eta^2_p = .18$. As shown in Figure 2, Bonferroni-corrected post-hoc tests revealed that words presented with Self-name ($M = .234, SD$
=.143) were significantly better remembered than those presented with Other-name 
\((M=.158, SD=.130), p < .001\), exhibiting an incidental SRE. Importantly, words 
presented with Mother-name \((M=.207, SD=.169)\) were also significantly better 
remembered than those presented with Other-name, \(p = .009\), providing evidence for 
an incidental MRE. Memory for words presented with Self-name vs. Mother-name 
did not significantly differ, \(p > .1\). The interaction between Culture and Name Identity 
was not significant, \(F(2, 136) = 1.58, p > .2\).

**Source Memory**

Source memory scores were calculated as the mean proportion of correctly 
recognized “old” words that were attributed to the correct source (i.e., the name 
presented with each word during the encoding phase). A 2 (Culture: Moroccan or 
American) x 2 (Name Identity: Self-name, Mother-name, or Other-name) mixed-
model analysis of variance (ANOVA) revealed a significant main effect of Culture, 
\(F(1, 68) = 9.14, p = .004, \eta^2_p = .12\), with American participants \((M=.484, SD =.193)\) 
showing significantly better source memory than Moroccan participants \((M=.395, SD 
= .177)\). The main effect of Name Identity was also significant, \(F(2, 136) = 18.40, p 
< .001, \eta^2_p = .21\). As shown in Figure 3, Bonferroni-corrected post-hoc tests revealed 
that source memory was significantly better for words presented with Self-name \((M 
= .521, SD = .195)\) than for those presented with Other-name \((M=.348, SD = .189), p < 
.001\), exhibiting an incidental SRE. Of importance, source memory was also 
significantly better for words presented with Mother-name \((M=.449, SD = .187)\) than 
for those presented with Other-name, \(p = .001\), providing evidence for an incidental 
MRE. In addition, source memory for words presented with Self-name was
significantly better than for those presented with Mother-name, $p = .029$. The interaction between Culture and Name Identity was not significant, $F(2, 136) = 1.48$, $p > .2$.

**Discussion**

The present study aimed to examine (a) whether the MRE would emerge under incidental, non-referential encoding context and (b) whether individualistic vs. collectivistic cultures affect the magnitude of the incidental MRE using American and Moroccan participants. Replicating previous findings of an incidental SRE (Cunningham et al., 2014; Kim et al., 2018; 2019; Turk et al., 2008), and in line with our hypothesis, we found a memory advantage for both item and source memory for target words presented with one’s own name compared to those presented with another person’s name. Importantly, as predicted, we also found a memory advantage for target words presented with the name of one’s mother compared to those presented with another person’s name in both item and source memory. In addition, we found that whereas one’s own name and the name of one’s mother produced similar levels of memory advantage for item memory, one’s own name produced greater memory advantage than the name of one’s mother for source memory. However, we found no significant difference between American and Moroccan participants in their sense of independent and interdependent self-construals. Likewise, contrary to our hypothesis, there was no significant effect of culture on the magnitude of the mother-memory advantage for item and source memory.

Of particular interest to this study is the significant difference in source memory between words presented with one’s own name and their mother’s which
was not seen in item memory. Previous research has shown that source memory requires greater attention (e.g., more complex initial processing) than does item memory (e.g., Castel & Craik, 2003; Troyer, Winocur, Craik, & Moscovitch, 1999) and that these two types of memory are supported by distinct neural mechanisms (Davachi, Mitchell, & Wagner, 2002; Gold et al., 2006; Leshikar and Duarte, 2012; Senkfor & Van Petten, 1998; Slotnick, Moo, Segal, & Hart Jr., 2003). Given these findings, our finding of greater SRE than MRE in source memory suggests that an individual’s personal, core self provides a heightened memory advantage over a close other when it comes to binding an item and its contextual features that requires greater attentional resources (Rosa & Gutchess, 2011). Future studies may quantify the amount of attention attracted by the self-relevant vs. mother-relevant cues under incidental encoding contexts and examine how different amounts of attention translates to the magnitude of the incidental self- and mother-memory advantages in both item and source memory.

Contrary to our expectation, we found no significant effect of culture on the magnitude of MRE. However, this null finding must be interpreted with caution as our American and Moroccan participant groups both reported stronger senses of independent than interdependent self. Given previous findings suggesting individualistic vs. collectivistic nature of American and Moroccan cultures (Balambo, 2014; Mone et al., 2016; Oumlil & Balloun, 2009; Veltri et al., 2011), this null finding may indicate that the current sample of Moroccan participants were not a good representative sample of Moroccan people as a whole.
Of note, while the official language of Morocco is Modern Standard Arabic (MSA), French and the Moroccan dialect (Darija) both fulfill other areas of importance in daily life, French in particular is considered the language of higher education (Chakrani, 2011; Ennaji, 2009; Marley, 2004; Redouane, 2010). In fact, the positioning of MSA as an official language is mostly in response to an effort to decolonize the country following independence in 1956 (Chakrani, 2011). Darija is more of the mother-tongue of the Moroccan people, and Moroccan people often only learn MSA through official schooling, sometimes alongside French (Chakrani, 2011; Ennaji, 2009; Redouane, 2010). French language and culture, due to Morocco’s former position as a French colony, permeate much of society, even leading to an elevated media and commerce presence of French over the Darija (Ennaji, 2009; Marley, 2004; Redouane, 2010). Due to the variation of language use in different sects of life, such as the street level vs. educational prestige, it is unknown how much Western and/or French priming participants experienced prior to arriving to the study site, or through the course of their daily lives as college students. Studies over the past few decades have also demonstrated the increasingly individualistic, democratic and urban youth emerging in Morocco. These more-Western influenced, urban beliefs have been linked with a loss of traditional values (Desrues, 2012; Macia, Lahman, Baali, Boëtsh, & Chapis-Lucciani., 2009; Tessler, 2000). Consequently, this distinction has led to certain portrayals of urban Moroccans more closely resembling French citizens than rural Moroccans (Macia et al., 2009).

Additionally, most of our Moroccan participants were majoring in English literature at a Moroccan university, and many chose to have the study explained in
further detail in English. Thus, it is possible that our Moroccan participant group may have been a self-selected group with more Western cultural leanings. This potential self-selection bias may indicate that the Moroccan participants may not be the most representative of Morocco, especially when taken into context that there is an unequal distribution in education level, literacy and drop-out rates between urban and rural areas, as well as between men and women (Desrues, 2012; Ennaji, 2009; Lavy, Spratt and Leboucher, 1995; Llorent-Bedmar, 2014; Karim, Mansouri, Nachat and Doumou, 2015). While university students typically serve as participants for psychological study in typical research endeavors, this self-selected group may be too far from the Moroccan norm to be a reliable data source.

Given the limitations of the present study, further research is required to determine the effects of culture on the magnitude of MRE and potential boundary conditions for the emergence of the MRE. For example, future studies may examine both the explicit and incidental SRE and MRE in countries with more collectivist leanings than Morocco in comparison with other Western individualist countries to see if the present findings are replicated. Collecting data from a wider variety of countries on the collectivism vs. individualism scale, in particular, would allow us to gain a deeper understanding of what cognitive and/or cultural factors need to be present for the MRE to emerge, both incidentally and explicitly. Using countries in such different locations could be useful so we can determine if it is the specific cultural or the amount of collectivist leaning that allows for the mother-reference effect to emerge. In a similar vein, future research can also examine the role of cultural priming in the emergence of the incidental mother-reference effect. Previous
research (Ng & Lai, 2009; Sui et al., 2007) showed that simply priming bilingual Chinese students with Western or Chinese images was sufficient to produce differential levels of memory advantage for words explicitly processed in reference to one’s mother. As previous research has suggested, explicit and incidental SRE are associated with different underlying mechanisms (i.e., greater elaboration/organization supported by using one’s self-concept at encoding vs. automatic attentional responses to personally-significant information), and future research is necessary to explore whether the effects of cultural priming for the explicit MRE would hold for the incidental MRE.

In summary, the present study demonstrated that a mother-memory advantage can arise from incidental associations between one’s mother and external stimuli, though there was no significant effect of culture on the magnitude of the MRE. Future research should provide a better understanding of the cognitive and cultural factors that contribute to the emergence of the mother-memory advantage, particularly in regard to cultural leanings.
References


Ng, S. H., & Lai, J. C. (2009). Effects of culture priming on the social connectedness


Tables

**Table 1.** Mean scores (standard error) of the Singelis Self-Construal subscales

<table>
<thead>
<tr>
<th></th>
<th>Independent Self-Construal</th>
<th>Interdependent Self-Construal</th>
<th>Difference Score (IND minus INT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moroccan</td>
<td>5.07 (.53)</td>
<td>4.73 (.72)</td>
<td>0.34 (.77)</td>
</tr>
<tr>
<td>American</td>
<td>4.98 (.55)</td>
<td>4.60 (.65)</td>
<td>0.38 (.82)</td>
</tr>
</tbody>
</table>

*Note.* IND and INT denote independent self-construal and interdependent self-construal, respectively.
Table 2. Mean proportion (standard error) of hits and false-alarms for item memory as a function of Culture and Name Identity

<table>
<thead>
<tr>
<th></th>
<th>Self-Name Hit</th>
<th>Mother-Name Hit</th>
<th>Other-Name Hit</th>
<th>False-Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moroccan</td>
<td>.219 (.152)</td>
<td>.203 (.181)</td>
<td>.168 (.147)</td>
<td>.329 (.221)</td>
</tr>
<tr>
<td>American</td>
<td>.249 (.134)</td>
<td>.212 (.159)</td>
<td>.148 (.112)</td>
<td>.190 (.177)</td>
</tr>
</tbody>
</table>

Note. There was no separate false-alarms per each Name Identity condition as there was a single pool of “new” items.
Figure 1. A schematic view of a trial sequence in the encoding phase. Numbers represent presentation durations in milliseconds (ms).
Figure 2. Item memory performance as a function of Name Identity among American and Moroccan participants. Error bars represent standard error of the mean (SEM). Asterisks indicate statistical significance at FDR-adjusted $p < .05$. Note that the presentation of the memory performance separately for different cultural groups is for illustrative purpose only as there was no significant interaction between Culture and Name Identity.
Figure 3. Source memory performance as a function of Name Identity among American and Moroccan participants. Error bars represent SEM. Asterisks indicate statistical significance at FDR-adjusted $p < .05$. Note that the presentation of the memory performance separately for different cultural groups is for illustrative purpose only as there was no significant interaction between Culture and Name Identity.