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# CHAPTER 4

## **Cross-cultural mental state reading ability in Antillean-Dutch, Moroccan-Dutch and Dutch young adults**

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## ABSTRACT

Understanding how bicultural and monocultural individuals are oriented towards the cultures they come into frequent contact with can increase insights into their adaptation and wellbeing. Previous research has shown a relation between culture and mental state reading in the form of the cultural in-group effect, which is defined as the advantage in reading mental states from the own cultural group compared to other groups. Thus, orientation towards cultures can be assessed not only in self-reported behavioral and psychological acculturation but also in the domain of social-cognitive abilities. The aim of the current research is to gain insight into acculturation in the social-cognitive ability of mental state reading. In addition, it explores how this facet of acculturation is related to the more traditionally studied behavioral and psychological acculturation. Cross-cultural mental state reading, language and possession of friends (behavioral acculturation), and cultural identification (psychological acculturation) were assessed in Antillean-Dutch ( $n = 128$ ), Moroccan-Dutch ( $n = 204$ ) and Dutch ( $n = 349$ ) young adults between 19 and 24 years old ( $M = 21.57$ ,  $SD = 1.38$ ). For cross-cultural mental state reading, the in-group effect was confirmed for the Dutch but not for the Antillean-Dutch and Moroccan-Dutch participants. However, association between mental state reading and behavioral and psychological acculturation in the three groups was not consistently observed. Despite this, the present results extend fundamental research on cross-cultural mental state reading and also help to further understand the orientation of these specific cultural groups.

## INTRODUCTION

Acculturation refers to the impact of intercultural contact on individuals' behavior, attitudes, and psychological processes (Sam & Berry, 2010; Ward & Geeraert, 2016). It applies especially to bicultural individuals who, in their daily life, frequently interact with different cultures. Traditionally, acculturation research focuses on socio-cultural factors, that is, assessing changes in the orientation of bicultural individuals towards the 'new culture' and 'culture of origin' in terms of language use and habits, attitudes towards social activities and psychological feelings of belonging and identity (Sam & Berry, 2010; Stevens, Pels, Vollebergh, & Crijnen, 2004; Ward & Geeraert, 2016). However, intercultural contact can impact other facets of life that are less directly intertwined with culture as well. In the present study, we have used a framework of cultural mindsets to understand acculturation in the social-cognitive process of mental state reading. This framework emphasizes that core mindsets differ between cultures, thereby resulting in cultural diversity in social cognition (Oyserman, 2011; Oyserman, 2017). Individuals have access to different mindsets, and the dynamic nature of mindsets implies that which one is active depends on contextual cues such as exposure to a specific culture (Elfenbein & Ambady, 2003; Oyserman, 2017). Consequently, individuals' exposure to a culture, as visible in the socio-cultural factors behavior and identification, is associated with their acculturation in mental state reading (Bjornsdottir & Rule, 2016). The aim of the current research was to gain insight into acculturation in mental state reading in Antillean-Dutch, Moroccan-Dutch and Dutch young adults and the interplay between acculturation in this facet and acculturation in self-reported socio-cultural factors (cultural identification, language use and friendship).

### **Cultural Mindsets and Acculturation in Mental State Reading**

Acculturation can be observed in all types of behaviors and cognitive, emotional and psychological processes that are impacted by cultural mindsets, which are sets of meanings that include knowledge of the self, cognitive procedures and interpersonal goals (Oyserman, 2011). The difference in the core themes between mindsets, which results in, for example, an emphasis on personal autonomy or on interpersonal connectedness, is also observed in social-cognitive processes. Mental state reading, a social-cognitive process that is part of Theory of Mind, can be regarded as a subtle and intricate social tool that is directly embedded in social interactions and relationships. It refers to the ability to "decode mental states on the basis of immediately available information such as facial expression" (Bora, Eryavuz, Kayahan, Sungu, & Veznedaroglu, 2006, p. 96; Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). This includes the recognition of simple (for instance, friendly) and more complex (for instance, suspicious) states. Moreover, mental state reading comprises the cognitive component of the

possession of a mental state lexicon (Fernández-Abascal, Cabello, Fernández-Berrocal, & Baron-Cohen, 2013), and also a more intuitive component that involves correctly assessing these states from facial expressions within immediate social interactions. It is through this intuitive component that cross-cultural differences in mental state reading emerge. Differences between cultural mindsets in interpersonal values and goals contribute to cultural diversity in facial emotional expressions, in terms of frequency, intensity and specific expression style (De Leersnyder, 2017; Elfenbein & Ambady, 2003; Jack, Garrod, Yu, Caldara & Schyns, 2012). Widespread support has been found for these culture-specific variations within the ongoing discussion on universality vs. cultural specificity of emotional expressions on the face (Chen & Jack, 2017; Ekman, 1987; Jack, Blais, Scheepers, Schyns, & Caldara, 2009; Jack et al., 2012; Marsh, Elfenbein, & Ambady, 2002; Matsumoto et al., 2008; Safdar et al., 2009).

An important observation in relation to mental state reading is the cultural in-group effect: mental state reading or simple emotion recognition is enhanced when individuals encounter the specific style of their own cultural group (Adams et al., 2010; Elfenbein & Ambady, 2003). For example, Asian individuals recognized emotional expressions in Asian faces better than in Western faces, whereas American or Canadian Western individuals recognized expressions in Western faces better (Adams et al., 2010; Elfenbein & Ambady, 2003). According to the theory of cultural mindsets, this effect shows how individuals are inclined towards the mindset primarily present in their culture and experience cultural fluency when encountering this style (Oyserman, 2011; Oyserman, 2017). Frequent exposure and the fact that it is their own style makes this style more familiar (Elfenbein & Ambady, 2003); this lowers the required effort in the intuitive process of reading mental states. In addition to this default tendency towards the mindset of the own culture, cultural mindsets are dynamic, and all individuals have access to different mindsets. Which mindset is active depends on immediate contextual cues and factors such as recent activations of this set of meanings (Oyserman, 2017). Recent and frequent exposure to any culture therefore impacts the presence of the cultural in-group effect. Most evidently, this affects bicultural individuals, who in their daily interactions are likely to frequently encounter different cultures. For instance, enhanced emotional or mental state reading of Western faces was observed in Chinese or East-Asian individuals who had lived in the US or Canada for a longer period of time, interacted more frequently with Canadians or endorsed mainstream Canadian values (Bjornsdottir & Rule, 2016; Elfenbein & Ambady, 2003). Similarly, exposure to and engagement with the mainstream culture of Korean-American and Turkish-Belgian individuals predicted similarity to mainstream (self-reported) emotional patterns (De Leersnyder, Mesquita, & Kim, 2011). If the bicultural individual is frequently exposed to both cultures, the in-group effect might consequently disappear altogether (De Leersnyder, 2017), or a main effect of the culture-of-origin in-group

advantage might remain but with individual fluctuations (Bjornsdottir & Rule, 2016).

These insights show how the mindset of a culture can become active through direct exposure in the form of contact with members of that culture (behavioral acculturation) or the sharing of values or cultural identification (psychological acculturation). Not only do these mechanisms concern orientations towards the majority as well as minority culture (Sam & Berry, 2010; Van Oudenhoven & Ward, 2013), but also their presence in other facets of acculturation such as personality (Eap et al., 2008; Güngör et al., 2013) and self-concept (Heine & Lehman, 2004) demonstrates that they are highly consistent. Investigating these mechanisms in the socially relevant construct of mental state reading can contribute significantly to understanding the impact of intercultural contact, especially when the focus is on groups other than the often-investigated Asian and Western ones.

### **Moroccan-Dutch, Antillean-Dutch and Dutch Cultural Groups: Characteristics, Acculturation Patterns and Cross-cultural Emotional Processes**

Antillean-Dutch and Moroccan-Dutch are two of the four main bicultural groups with a migration history in the Netherlands (Merz, Özeke-Kocabas, Oort, & Schuengel, 2009; Schalk-Soekar, van de Vijver, & Hoogsteder, 2004; Stupar, van de Vijver, Te Lindert, & Fontaine, 2014). The cultures of origin of both of these groups are, compared to the Dutch culture, more oriented towards family and group values; in addition, they have a more extensive religious affiliation and are less secular (Merz et al., 2009; Phalet & Schonplufg, 2001; Stupar et al., 2014; Van de Vijver, 2007). Whereas the Moroccan culture is somewhat more conservative and traditional in these respects, the Antillean culture is closer to the Dutch. The bicultural groups in the Netherlands are characterized by this positioning of the three cultures, which is intensified by their migration histories, immigration policies and demographic factors (De Valk & Billari, 2007; Merz et al., 2009; Stupar et al., 2014). Though first generations of both groups came to the Netherlands during the 1960s, Moroccan individuals came mostly as migrant workers (the majority were from the Rif area, being therefore part of the Berber subculture [Fokkema, Harmsen, & Nicolaas, 2009; Van Ditzhuijzen, 2005]) and were encouraged to maintain their culture of origin given the temporary intention of their stay (Jennissen, 2009; Stupar et al., 2014). The Dutch Antilles, on the other hand, are a former colony of the Netherlands and (mostly) still part of the Dutch Kingdom (De Valk & Billari, 2007). Antillean-Dutch migrants, who mostly came to the Netherlands for educational purposes, have thus been exposed to Dutch culture for much longer and also tend to have higher educational levels than Moroccan-Dutch individuals (De Valk & Billari, 2007; Ooijevaar, Bloemendaal, & Boerdam, 2016; Schalk-Soekar et al., 2004). Young adults of both groups, however,

are nowadays mostly second-generation immigrants (Merz et al., 2009), and they are generally closer to Dutch culture than their parents.

Acculturation patterns of attitudes, belonging and identity and behavior show that Antillean-Dutch young adults as well as adults perceive themselves as closer to Dutch culture than do Moroccan-Dutch individuals (Schalk-Soekar et al., 2004; Stupar et al., 2014). Moreover, the attitude towards maintaining the culture of origin is more negative in Antillean-Dutch than in Moroccan-Dutch individuals (Schalk-Soekar et al., 2004). Moroccan-Dutch adults and adolescents tend to feel at home in and identify with both Moroccan and Dutch culture, or mainly and more strongly Moroccan culture (Stevens et al., 2004; Stevens, Pels, Vollebergh, & Crijnen, 2007; Novin, Banerjee, & Rieffe, 2012; Özbek, Bongers, Lobbestael, & van Nieuwenhuizen, 2015). Acculturation in mental state reading has not been studied in these groups, but some studies have focused on emotional processes, mainly of Moroccan-Dutch individuals. In one such study, Antillean-Dutch young adults and adults were found to show a lower report of emotional expression than Moroccan-Dutch individuals, placing them closer to the Dutch (Stupar, van de Vijver, & Fontaine, 2015). In addition, a comparison of Dutch and Moroccan monocultural adolescents to Moroccan-Dutch adolescents with regard to anger expression style showed that Moroccans were less open and direct than Dutch adolescents, and also that the bicultural group appeared to fall in between both cultures (Novin & Rieffe, 2011). This indirect indication of the effect of cultural exposure (with Moroccan-Dutch individuals being in between Dutch and Moroccan ones in terms of anger expression) is confirmed by the association between identification with Dutch culture and reports of anger regulation similar to their Dutch peers in Moroccan-Dutch adolescents (Novin et al., 2012). Taken together, these findings indicate that cross-cultural differences in mental state reading are likely to exist between the Antillean, Moroccan and Dutch cultures, and that variation in the familiarity of bicultural individuals with both cultures is relevant for understanding their patterns of acculturation in this respect.

### **Current Research**

The aim of the current research was to gain insight into acculturation in the social-cognitive process of mental state reading in Antillean-Dutch, Moroccan-Dutch and Dutch young adults. To this end, the ability to read Antillean and Western eyes (in Antillean-Dutch and Dutch participants) or the ability to read Moroccan and Western eyes (in Moroccan-Dutch and Dutch participants) was compared. Because a general cultural in-group advantage may be present in bicultural groups, we expected that, first, Antillean-Dutch individuals are better at reading Antillean eyes than Western eyes, and second, Moroccan-Dutch individuals are better at reading Moroccan eyes than Western eyes. Third, we also expected Dutch individuals to be better at reading Western eyes than reading Antillean or Moroccan eyes.

The second aim of this study was to understand the association between acculturation in mental state reading and self-reported psychological and behavioral acculturation, which reflected daily familiarity with both cultures. Therefore, the association between cross-cultural mental state reading and self-reported acculturation in three socio-cultural factors, i.e., cultural identification, language and friends, was explored. The in-group effect was expected to vary between individuals depending on how familiar they were with the mindset and, consequently, mental state reading of both cultures. In Antillean-Dutch individuals, a positive relation was expected between the ability to read Antillean eyes and identification with Antillean culture, speaking Papiamentu and having Antillean friends, as well as between the ability to read Western eyes and identification with Dutch culture, speaking Dutch and having Dutch friends. Similarly, in Moroccan-Dutch individuals, identification with Moroccan culture, speaking Arabic or Berber and having Moroccan friends was expected to be positively related to the ability to read Moroccan eyes, whereas identification with Dutch culture, speaking Dutch and having Dutch friends was expected to be positively related to reading Western eyes. Finally, in Dutch participants, a positive relation was expected between having Antillean friends and the ability to read Antillean eyes and between having Moroccan friends and the ability to read Moroccan eyes. In all models, stronger effects were expected for language and friends than for cultural identification, since behavioral acculturation might more directly reflect daily interactions and familiarity. Further, in all the models, mental state reading of a specific culture was related to acculturation factors corresponding to that culture (as described above) as well as to acculturation factors referring to the other culture, in order to obtain a comprehensive picture. Finally, participants' gender and educational level were included as control factors because of a known gender difference in favor of females (Vellante et al., 2013) and the strong language component of the mental state reading task (Yildirim et al., 2011).

## **METHOD**

### **Participants**

The complete sample of participants consisted of 681 young adolescents (including 399 females) with an Antillean-Dutch, Moroccan-Dutch or Dutch background. Antillean-Dutch and Moroccan-Dutch background was determined based on country of birth of at least one of their parents. For the Dutch participants, both parents had to have been born in the Netherlands. All participants were living in Amsterdam during the first wave of the project. Demographics and the acculturation questionnaires, the latter of which was completed by only a subsample (as some participants had skipped all or some of the questions) of the Antillean-Dutch and Moroccan-Dutch participants ( $N = 275$ ),

were collected during this first wave. The participants were between 17 and 22 years old (Table 1). The educational level of the participants and both their parents was classified as low (0–2), moderate (3–4) and high (6–7) based on the international ISCED categorization (Table 1). During the fourth wave of the study, when the participants were between 19 and 24 years old, the Reading the Mind in the Eyes (RME) tasks were completed. Six participants were excluded before the analyses either because they had received the incorrect RME version (three participants) or because their ethnic background was unknown (three participants).

**Table 1.** *Demographics of the total sample*

	Total ( <i>N</i> = 681)	Dutch ( <i>n</i> = 349)	Moroccan- Dutch ( <i>n</i> = 204)	Antillean-Dutch ( <i>n</i> = 128)
Age wave 1 <i>M</i> ( <i>SD</i> )	19.47 (1.32)	19.38 (1.35)	19.50 (1.32)	19.65 (1.22)
Age wave 4 <i>M</i> ( <i>SD</i> )	21.57 (1.38)	21.50 (1.34)	21.71 (1.37)	21.84 (1.21)
Females (%)	58.6	54.5	60.3	67.2
Educational level of participant (%)				
Low	18.6	25.8	11.3	14
Moderate	31.6	18.1	45.6	59
High	49.8	56.2	43.1	55
Educational level of the father (%)				
Low	34.3	17.4	68.3	34.0
Moderate	15.1	13.0	14.3	23.0
High	50.6	69.6	17.4	43.0
Educational level of the mother (%)				
Low	32.0	12.7	66.1	33.6
Moderate	25.8	24.5	23.7	32.8
High	42.2	62.8	10.2	33.6
Criminal record (%)	15.7	18.6	15.2	8.6

## Procedure

The data used in this study are part of the Transitions in Amsterdam (TransAM) project and were collected during two waves (the first and the fourth) of this longitudinal study. The TransAM project, involving Dutch young adults with different ethnic backgrounds, is conducted by the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR) (Blokland, 2014). A sample of men and women aged 18, 19.5, and 21 years living in Amsterdam were randomly selected from the municipal registry to participate. The sample selection was stratified in order to obtain equal proportions of males and females and sufficient

participants with Moroccan-Dutch and Antillean-Dutch backgrounds. In addition, the number of participants with registered police contacts prior to the age of 17 was higher than average because one of the aims of the TransAM project was to study delinquent development in the early adult years (Hill, Blokland, & Van der Geest, 2016). Potential participants were first contacted by mail, and trained interviewers later visited them at home. In the case of participants who agreed to partake in the project, they were interviewed at a later date either at home or at the Vrije Universiteit campus. The acculturation questions were completed by the participants themselves, in the order in which they were listed in the measurements section. All participants were presented with all the relevant questionnaires and requested to fill them out. When a question was skipped, participants received an automatic notification, but they could still choose to move on to the next page without filling out the question. Communication concerning the project and the data collection itself was in Dutch. Participants were offered gift cards of €15 at the completion of each interview. Participants completed the fourth wave between 13 and 35 months after their completion of the first wave ( $M = 19.48$ ,  $SD = 2.41$ ). The TransAM project was approved by the registry committee of the municipality of Amsterdam, the Ministry of Justice and the Ethics Commission for Criminological Research (CERCO).

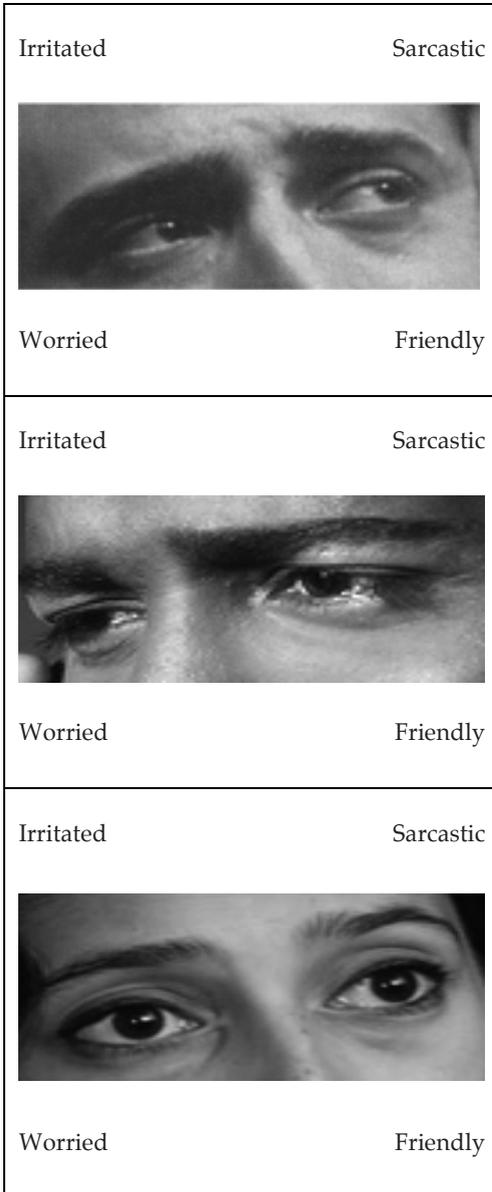
## Measures

### *Cross-cultural mental state reading*

Mental state reading was measured with the Dutch translation of the RME (Baron-Cohen et al., 2001). The RME consists of pictures of eyes that depict mental states. Each picture is accompanied by four words describing mental states, including one target and three foil words. Participants are required to choose the correct state. The original RME (Baron-Cohen et al., 2001; Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997) consists of 36 pictures. The majority of the eyes depicted in these pictures are Caucasian, and this version is commonly referred to as the Caucasian or Western mental state reading task (Adams et al., 2010; Bjornsdottir & Rule, 2016). In order to assess cross-cultural mental state reading in the current samples, this instrument was adapted into two additional versions—one with pictures of Moroccan eyes and one with pictures of Antillean eyes—in strict accordance with the procedure used for a previous similar adaptation (Adams et al., 2010) as well as for the original construction of the RME (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001). The aim of this adaptation was to construct new RME versions consisting of items that matched the original RME completely with regard to the combinations of target and foil words but differed with regard to the accompanying pictures.

Two pilot studies were conducted to construct the Antillean and the Moroccan RME. In both studies, pictures of Antillean or Moroccan faces were collected online by three of the involved researchers. These pictures were adapted

into black and white colors and the eye region was selected; this region consists of a rectangular area of  $5 \times 12.5$  cm around the eyes, starting above the eyebrows and ending halfway through the nose. Next, these pictures were matched by the researchers to the 36 target words of the original RME to create a Moroccan and an Antillean version of the RME.



**Figure 1.** Example items for Western, Antillean and Moroccan RME.

The pictures were validated in two or three rounds of an online questionnaire in a group of 18 Moroccan-Dutch and 18 Antillean-Dutch participants (see appendix A for further details on the pilot studies). The instructions stated that participants would see pictures of eyes accompanied by words and had to pick the word that best described the eyes. A glossary was provided with a definition of all the target and foils words and how they are used in a sentence.

The instruction and the tasks themselves were in Dutch, both in these pilots and in the final versions. Three final RME versions were constructed: 21 items with Antillean eyes, 21 items with Moroccan items and the original 21 items with Caucasian eyes (Figure 1). All combinations of target and foil words were identical across the three versions (Table 2). These versions were combined into a Moroccan-Western and Antillean-Western version, each of which comprised 42 pictures and one example picture.

**Table 2.** Target and foil words for the RME

Item	Target mental state	Foil 1	Foil 2	Foil 3
<i>Example</i>	<i>Panicked</i>	<i>Jealous</i>	<i>Arrogant</i>	<i>Hateful</i>
1	<i>Playful</i>	<i>Comforting</i>	<i>Bored</i>	<i>Irritated</i>
2	<i>Insisting</i>	<i>Joking</i>	<i>Amused</i>	<i>Relaxed</i>
3	<i>Worried</i>	<i>Irritated</i>	<i>Sarcastic</i>	<i>Friendly</i>
4	<i>Fantasizing</i>	<i>Aghast</i>	<i>Impatient</i>	<i>Alarmed</i>
5	<i>Despondent</i>	<i>Relieved</i>	<i>Shy</i>	<i>Excited</i>
6	<i>Preoccupied</i>	<i>Annoyed</i>	<i>Hostile</i>	<i>Horrorified</i>
7	<i>Anticipating</i>	<i>Decisive</i>	<i>Threatening</i>	<i>Shy</i>
8	<i>Thoughtful</i>	<i>Irritated</i>	<i>Encouraging</i>	<i>Sympathetic</i>
9	<i>Tentative</i>	<i>Arrogant</i>	<i>Grateful</i>	<i>Sarcastic</i>
10	<i>Friendly</i>	<i>Dominant</i>	<i>Guilty</i>	<i>Horrorified</i>
11	<i>Fantasizing</i>	<i>Embarrassed</i>	<i>Confused</i>	<i>Panicked</i>
12	<i>Defiant</i>	<i>Contented</i>	<i>Apologetic</i>	<i>Curious</i>
13	<i>Pensive</i>	<i>Irritated</i>	<i>Excited</i>	<i>Hostile</i>
14	<i>Hostile</i>	<i>Alarmed</i>	<i>Shy</i>	<i>Anxious</i>
15	<i>Cautious</i>	<i>Joking</i>	<i>Arrogant</i>	<i>Reassuring</i>
16	<i>Reflective</i>	<i>Impatient</i>	<i>Aghast</i>	<i>Irritated</i>
17	<i>Flirtatious</i>	<i>Grateful</i>	<i>Hostile</i>	<i>Disappointed</i>
18	<i>Confident</i>	<i>Ashamed</i>	<i>Joking</i>	<i>Dispirited</i>
19	<i>Concerned</i>	<i>Embarrassed</i>	<i>Guilty</i>	<i>Fantasizing</i>
20	<i>Distrustful</i>	<i>Aghast</i>	<i>Baffled</i>	<i>Terrified</i>
21	<i>Suspicious</i>	<i>Ashamed</i>	<i>Nervous</i>	<i>Indecisive</i>

All Moroccan-Dutch participants ( $n = 204$ ) completed a 42-item version with 21 pictures with Western eyes and 21 corresponding pictures with Moroccan eyes (with an example with Moroccan eyes). Half of the Dutch participants ( $n = 181$ ) completed this version as well (with an example with Western eyes). To control for a possible effect of order on the main interaction effect between the RME

version and cultural group (for instance, Antillean-Dutch participants scoring higher on the Antillean version only if they started with that version), half of the participants in both groups started with the Moroccan eyes ( $n = 188$ ) and the other half started with the Western eyes ( $n = 197$ ). All Antillean-Dutch participants ( $n = 128$ ) and the other half of the Dutch participants ( $n = 168$ ) completed a 42-item version with 21 pictures with Western eyes and 21 corresponding pictures with Antillean eyes. The Dutch participants started with an example with Western eyes, and the Antillean-Dutch participants started with an example with Antillean eyes. In the case of these participants too, half started with the Antillean eyes ( $n = 139$ ) and the other half started with the Western eyes ( $n = 157$ ).

### ***Psychological acculturation***

Cultural identification was measured as an aspect of psychological acculturation, by using two items for the Antillean-Dutch participants: 'I see myself as Dutch' and 'I see myself as Antillean' (Stevens et al., 2004). The Moroccan-Dutch participants were presented with four items: 'I see myself as Dutch', 'I see myself as Moroccan', 'I see myself as Berber' and 'I see myself as Arabic'. It is common to make this distinction when assessing Moroccan identification, although this information is usually considered together to indicate identification with Moroccan culture in general (Sterckx & van der Ent, 2015). Here, a general Moroccan identification score for each participant was obtained by using the item for which identification was highest. All items were answered on a scale of one (strongly disagree) to four (strongly agree). In addition, participants could respond with 'I don't know'.

### ***Behavioral acculturation***

First, language use was assessed by inferring how often Moroccan-Dutch participants spoke Dutch and Arabic or Berber, and how often Antillean-Dutch participants spoke Dutch, English and Papiamentu with their close others (Stevens et al., 2004). Three questions were included for each language—speaking the language with parents, siblings and Moroccan or Antillean friends. These items were answered on a scale of one (never) to five (always), and the option of 'non-applicable' was also provided. The three items were combined to obtain one indication for each language. Papiamentu and English were used in the Antillean-Dutch group since both are languages used in the Dutch-Antilles and by Antillean-Dutch individuals (Guus, Aarts, van der Avoird, Broeder, & Yagmur, 2002). However, Papiamentu is the main language of the Dutch Antilles (Extra, Aarts, van der Avoird, Broeder, & Yagmur, 2002), as confirmed by its higher report in the current sample. Therefore, Papiamentu was included for the Antillean-Dutch participants as an indication of their Antillean language use. Cronbach's alpha for the combined language scores (based on participants who completed all three language items) was .478 for the Dutch language and .706 for

Arabic/Berber in the Moroccan-Dutch group, and .409 for Dutch and .908 for Papiamentu in the Antillean-Dutch group<sup>1</sup>.

Second, all participants were presented with six items for inferring whether they had friends with specific backgrounds (for example, 'Do you have Antillean friends?'), to which the response could be *yes* or *no*. For the current research, three items were used—having Dutch friends, Antillean friends and Moroccan friends.

## RESULTS

### Cross-cultural Mental State Reading

Prior to assessing the differences between the three cultural groups for the RME versions, performance on the RME task was explored at the average and item level. Histograms for each RME version in the total sample as well as for the subsamples defined by cultural group showed normal distributions, though slight deviations were found for some versions in specific samples. The Western RME showed positive excess kurtosis in the total sample (kurtosis = 1.14) as well as in the Dutch sample (kurtosis = 2.53), for which it showed slight skewness to the right as well (skewness = -1.07). In the subsample of all participants who completed the Moroccan RME, the Dutch subsample showed positive excess kurtosis (kurtosis = 3.21) for the Western RME, which showed skewness to the right (skewness = -1.34). Further, the Moroccan RME showed positive excess kurtosis in the total sample (kurtosis = 1.13) and in the Dutch sample (kurtosis = 2.14), where it was also showed slight skewness to the right (skewness = -1.02). In all three versions, a few items were chosen correctly by less than 50% or more than 90% of the participants. Since low and high outliers in this range tend to occur with the RME (Fernández-Abascal et al., 2013; Prevost et al., 2014; Vellante et al., 2013), these items were included in the tasks.

Differences between the three cultural groups with regard to the control factors were also explored. First, Pearson's chi-square tests showed a significant association between gender and cultural background ( $\chi^2(2) = 6.62, p = .037$ ); this indicates that the proportion of men and women was not equivalent across the three cultural groups. Second, there was a significant association between the educational level of the participants and their cultural background ( $\chi^2(4) = 66.86, p < .01$ ). Third, point-biserial correlation showed that there was no significant association between age and cultural background ( $r_s(679) = .072, p = .059$ ). Finally, the effect of the order in which the RME versions were completed was checked. In the group of Dutch and Antillean-Dutch participants who completed the Antillean and Western RME, point-biserial correlations showed that whether participants started with the Antillean or Western version was not associated with performance on the Western RME ( $r_s(294) = .07, p = .250$ ), but it was associated

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<sup>1</sup> The low alpha values are probably partly attributable to the small number of items.

with performance on the Antillean RME ( $r_b(294) = -.28, p < .01$ ). In the group of participants who completed the Moroccan and the Western RME, which version participants started with was associated both with performance on the Western RME ( $r(383) = .13, p = .013$ ) and performance on the Moroccan RME ( $r_b(383) = -.118, p = .021$ ). Consequently, gender, educational level and order were included in the ANOVAs described below in order to control for their effects.

The expected advance of the three groups in reading eyes from their original cultural background was tested using two mixed ANOVAs. In the first ANOVA, scores were compared between Antillean-Dutch and Dutch participants who completed the Antillean and Western RME. RME version (within participants, two levels: Antillean and Western), cultural background (two levels: Antillean-Dutch and Dutch), gender, educational level of the participants, and order of the RME versions (two levels: Antillean RME first and Western RME first) were included as independent variables, to assess their effects on the RME scores. For the Western version, the assumption of equal variances was not violated. For the Antillean version, however, Levene's test indicated unequal variances ( $F(23,272) = 1.78$ ), with a larger variance observed in the Antillean group than in the Dutch group. First, a main effect of the RME version was observed ( $F(1,290) = 12.77, p < .01$ , partial  $\eta^2 = .042$ ): the overall score for the Western RME was higher than that for the Antillean RME (Table 3). A main effect of cultural background was also observed ( $F(1,290) = 15.92, p < .01$ , partial  $\eta^2 = .052$ ): the Dutch participants scored higher than the Antillean participants. Second, there was an interaction effect between RME version and cultural background ( $F(1,290) = 8.19, p = .005$ ,  $\eta^2 = .027$ ). Simple main effect analysis confirmed that Dutch participants scored higher on the Western than on the Antillean version ( $F(1,290) = 25.19, p < .001$ ), whereas Antillean-Dutch participants scored equally high on both versions ( $F(1,290) = .33, p = .567$ ) (Table 3). The findings that involve the control factors gender, educational level and order are included in Appendix B.

In the second ANOVA, scores were compared between Moroccan-Dutch and Dutch participants who completed the Moroccan and Western RME. RME version (within participants, two levels: Moroccan and Western), cultural background (two levels: Moroccan-Dutch and Dutch), gender, educational level of the participants, and order of the RME versions (two levels: Moroccan RME first and Western RME first) were included as independent variables, to assess their effects on the RME scores. First, there was no main effect of RME version ( $F(1,379) = .055, p = .815$ ), but a main effect of cultural background was present ( $F(1,379) = 25.28, p < .01$ , partial  $\eta^2 = .063$ ), with Dutch participants scoring higher than the Moroccan-Dutch participants (Table 4). Second, an interaction effect between RME version and cultural group was observed ( $F(1,379) = 4.99, p = .026$ , partial  $\eta^2 = .013$ ). Similar to the results of the first ANOVA, the Dutch participants scored higher on the Western than on the Moroccan version (marginally significant in simple main effects analysis:  $F(1,379) = 2.93, p = .088$ ) while the Moroccan-Dutch participants

scored similarly on both versions ( $F(1,379) = 1.97, p = .162$ ) (Table 4). Findings that involve the control factors gender, educational level and order are included in Appendix B.

**Table 3.** Means and standard deviations for the scores on the Western and Antillean RME

	Dutch participants	Antillean-Dutch participants	All
	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>
Western RME	16.14 (.21)	14.70 (.25)	15.42 (.17)
Antillean RME	14.97 (.18)	14.54 (.21)	14.75 (.14)
Both	15.56 (.16)	14.62 (.19)	

**Table 4.** Means and standard deviations for the scores on the Western and Moroccan RME

	Dutch participants	Moroccan-Dutch participants	All
	<i>M (SE)</i>	<i>M (SE)</i>	<i>M (SE)</i>
Western RME	15.15 (.23)	13.43 (.23)	14.29 (.17)
Moroccan RME	14.77 (.22)	13.74 (.23)	14.25 (.16)
Both	14.96 (.20)	13.58 (.20)	

**Table 5.** Descriptives for socio-cultural acculturation factors in the three groups

	Dutch	Antillean-Dutch	Moroccan-Dutch
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Identification with Dutch culture	--	3.03 (1.08)	3.17 (.95)
Identification with Antillean culture	--	2.78 (1.20)	--
Identification with Moroccan culture	--	--	3.45 (.83)
Talking Dutch	--	4.09 (1.11)	3.96 (.81)
Talking Papiamentu	--	2.32 (1.42)	--
Talking Arabic/Berber	--	--	2.81 (.96)
	% Yes	% Yes	% Yes
Dutch friends	99.1	91.4	79.9
Antillean friends	21.5	73.4	--
Moroccan friends	27.2	--	94.6

### Acculturation and Mental State Reading in the Two Bicultural Groups and the Dutch Group

Hierarchical regression models were used to test whether orientation towards a culture in the form of cultural identification, language and friends was positively related to the ability to read mental states from that culture. Separate models were analyzed with Antillean, Moroccan or Western mental state reading as the dependent variable. The use of hierarchical models made it possible to differentiate between the predictors: gender and educational level (as control

variables entered in the first block)<sup>2</sup>, orientation towards the culture corresponding to the culture of the mental states of the dependent variable (second block), and orientation towards the other culture (third block). For each model, assumptions were checked for multicollinearity (tolerance and VIF values), homoscedasticity and linearity (plots of standardized residuals), independence of errors (the Durbin-Watson test), and normal distribution of errors (histograms and normal probability plots of the standardized residuals). Unless otherwise specified below, these assumptions were met.

### *The Antillean-Dutch group*

In the Antillean-Dutch group, two models were tested (Table 6). Both models included 72 participants; participants who missed one or more acculturation questions were excluded from the analysis (9 participants answered 'I don't know' on the Antillean and Dutch identification question, 12 participants skipped the questions on Papiamentu and 1 participant skipped the question on Antillean friends) (descriptives for the socio-cultural acculturation factors can be found in Table 5. In addition, socio-cultural acculturation patterns of the Antillean-Dutch group, the Moroccan-Dutch group and a comparison between the groups are described in appendix C).

In the first model, the relation between Antillean mental state reading and gender and education (first block); Antillean identification, speaking Papiamentu and Antillean friends (second block); and Dutch identification, speaking Dutch and Dutch friends (third block) was assessed. Gender and educational level were not predictive of Antillean mental state reading ( $R^2 = .051$ ,  $F(2,71) = 1.86$ ,  $p = .163^3$ ). Adding Antillean identification, speaking Papiamentu and Antillean friends improved the overall model, making the model significant ( $R^2 = .159$ ,  $F(5,71) = 2.50$ ,  $p = .039$ ). However, only two marginally significant predictors were found: Antillean identification ( $p = .063$ ) and Antillean friends ( $p = .065$ ). The addition of Dutch identification, Dutch language and Dutch friends did not improve the model and did not make it significant ( $R^2 = .184$ ,  $F(8,71) = 1.78$ ,  $p = .098$ ).

In the second model, the relation between Western mental state reading and gender and education (first block); Dutch identification, speaking Dutch and Dutch friends (second block); and Antillean identification, speaking Papiamentu and Antillean friends (third block) was assessed. The model significantly predicted Western mental state reading ( $R^2 = .128$ ,  $F(2,71) = 5.05$ ,  $p = .009$ ), with educational level being a significant predictor ( $p = .006$ ). Addition of the second block of predictors did not significantly improve the prediction of Western mental state reading, but it made the model itself significant ( $R^2 = .209$ ,  $F(5,71) = 3.49$ ,  $p =$

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2 Possible order effects are considered to have been sufficiently ruled out in the first research question.

3 Findings concerning gender and educational level in all hierarchical models are included in the main text to keep the description of the steps of these models intact.

.007). In addition to educational level ( $p = .034$ ), identification with Dutch culture was a marginally significant predictor ( $p = .071$ ). Finally, the addition of Antillean identification, speaking Papiamentu and Antillean friends improved the model ( $R^2 = .315$ ,  $F(8,71) = 3.63$ ,  $p = .002$ ). Educational level ( $p = .008$ ) and speaking Papiamentu were significant predictors in this model ( $p = .022$ ).

**Table 6.** Hierarchical regression analyses in the Antillean-Dutch group for predicting Antillean and Western mental state reading

		Model			
Antillean RME		Western RME			
Predictor	$\Delta R^2$	$\beta$	Predictor	$\Delta R^2$	$\beta$
Step 1	.05		Step 1	.13*	
Gender		-.14	Gender		-.17
Educational level		-.18	Educational level		.32*
Step 2	.11*		Step 2	.09	
Gender		-.11	Gender		-.12
Educational level		-.15	Educational level		.25*
Antillean identification		-.31	Dutch identification		.23
Papiamentu		-.16	Dutch language		.11
Antillean friends		.28	Dutch friends		.04
Step 3	.02		Step 3	.11*	
Gender		-.09	Gender		-.14
Educational level		.10	Educational level		.31*
Antillean identification		-.29	Dutch identification		.16
Papiamentu		-.05	Dutch language		-.13
Antillean friends		.28	Dutch friends		-.05
Dutch identification		.04	Antillean identification		-.09
Dutch language		.15	Papiamentu		-.39*
Dutch friends		.19	Antillean friends		-.03
Total $R^2$	.18		Total $R^2$	.35	

.+  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$

### *The Moroccan-Dutch group*

Two similar models were tested in the Moroccan-Dutch group (Table 7). Both models included 157 participants; participants who missed one or more acculturation questions were excluded from the analysis (9 participants answered 'I don't know' on the Moroccan identification question, 14 participants answered 'I don't know' on the Dutch identification question, 3 participants did not answer the questions on Arabic and Berber language use, and 1 participant skipped the question on Moroccan friends and Dutch friends) (see Table 5 for descriptives of the socio-cultural acculturation factors. In addition, socio-cultural acculturation patterns of the Antillean-Dutch group, the Moroccan-Dutch group and a comparison between the groups are described in appendix C).

In the first model, the relation between Moroccan mental state reading and gender and education (first block); Moroccan identification, speaking Berber or Arabic and Moroccan friends (second block); and Dutch identification, speaking Dutch and Dutch friends (third block) was assessed. The model could predict Moroccan mental state reading ( $R^2 = .143$ ,  $F(2, 156) = 12.87$ ,  $p < .001$ ), with only gender appearing as a significant predictor ( $p < .001$ ; females scored higher than males). Addition of the second block also made the model significant ( $R^2 = .159$ ,  $F(5, 156) = 5.72$ ,  $p < .001$ ), but it was not a better predictor of Moroccan mental state reading than the first version and only gender was found to be a significant predictor ( $p < .001$ ). Addition of the third block did improve its prediction of mental state reading ( $R^2 = .211$ ,  $F(8, 156) = 4.94$ ,  $p < .001$ ). In this model, in addition to gender ( $p < .001$ ), speaking Dutch was also a significant predictor of the ability to read Moroccan mental states ( $p = .012$ ).

**Table 7.** Hierarchical regression analyses in the Moroccan-Dutch group for predicting Moroccan and Western mental state reading

		Model			
		Moroccan RME		Western RME	
Predictor	$\Delta R^2$	$\beta$	Predictor	$\Delta R^2$	$\beta$
Step 1	.14**		Step 1	.15**	
Gender		-.37**	Gender		-.33**
Educational level		.09	Educational level		.20*
Step 2	.02		Step 2	.06*	
Gender		-.36**	Gender		-.28**
Educational level		.09	Educational level		.17*
Moroccan identification		.01	Dutch identification		-.13
Arabic/Berber		.06	Dutch language		.23*
Moroccan friends		-.12	Dutch friends		-.04
Step 3	.05*		Step 3	.00	
Gender		-.29**	Gender		-.28**
Educational level		.06	Educational level		.18*
Moroccan identification		-.05	Dutch identification		-.13
Arabic/Berber		.11	Dutch language		.24*
Moroccan friends		-.08	Dutch friends		-.06
Dutch identification		-.07	Moroccan identification		-.04
Dutch language		.28*	Arabic/Berber		.00
Dutch friends		-.07	Moroccan friends		.02
Total $R^2$	.21		Total $R^2$	.21	

<sup>†</sup>  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$

In the second model, the relation between Western mental state reading and gender and education (first block); Dutch identification, speaking Dutch and Dutch friends (second block); and Moroccan identification, speaking Berber or Arabic and Moroccan friends (third block) was assessed. The model could predict

Western mental state reading ( $R^2 = .148$ ,  $F(2,156) = 13.37$ ,  $p < .001$ ), and both gender ( $p < .001$ ; females scored higher than the males) and educational level ( $p = .009$ ) were significant predictors. Addition of the second block explained more of the variance in Western mental state reading ( $R^2 = .206$ ,  $F(5,156) = 7.84$ ,  $p < .001$ ). In addition to gender ( $p = .001$ ) and educational level ( $p = .020$ ), Dutch language use was also found to be a significant predictor ( $p = .003$ ), and identification with Dutch culture was found to be a marginally significant predictor ( $p = .078$ ). Finally, addition of the third block did not improve the prediction of mental state reading, but the model was still significant ( $R^2 = .208$ ,  $F(8,156) = 4.85$ ,  $p < .001$ ). Gender ( $p = .001$ ), educational level ( $p = .020$ ) and Dutch language use ( $p = .005$ ) were identified as significant predictors of Western mental state reading.

### *The Dutch group*

Three models were tested in the Dutch group (Table 8). In these models, only having friends with an Antillean or Moroccan background were included as predictors, since in the Dutch group almost all participants reported having Dutch friends, which resulted in insufficient variance in this variable (see Table 5). Further, 168 of the Dutch participants completed the Antillean RME while the other 181 Dutch participants completed the Moroccan RME. All these participants completed the Western RME as well; therefore, in the model for the Western RME, these two groups of Dutch participants were taken together and Western mental state reading was related to both having Antillean and having Moroccan friends.

First, the relation between Antillean mental state reading and gender and educational level (first block) and Antillean friends (second block) was assessed. Three participants were excluded because they missed the item on having Antillean friends. Gender and educational level were not predictors of Antillean mental state reading, so the model was not significant ( $R^2 = .017$ ,  $F(2,164) = 1.39$ ,  $p = .251$ ). However, the addition of Antillean friends improved its prediction of Antillean mental state reading ( $R^2 = .059$ ,  $F(3,164) = 3.39$ ,  $p = .020$ ), and Antillean friends was found to be a significant predictor ( $p = .008$ ).

In the second model, the relation between Moroccan mental state reading and gender and educational level (first block) and Moroccan friends (second block) was assessed. Three participants who missed the item on Moroccan friends were excluded. This model was found to be significant ( $R^2 = .047$ ,  $F(2,177) = 4.36$ ,  $p = .014$ ), with gender appearing as a significant predictor ( $p = .012$ ; females scored higher than males). The model was improved by adding Moroccan friends ( $R^2 = .07$ ,  $F(3,177) = 4.34$ ,  $p = .006$ ). In addition to gender ( $p = .035$ ), Moroccan friends was found to be a significant predictor ( $p = .044$ ).

In the third model, the relation between reading Western mental states and gender and educational level (first block) and both Antillean and Moroccan friends (second block) was assessed. Seven participants missed the item on Antillean friends and/or the item on Moroccan friends and were therefore

excluded. Further, in this model the assumption of homoscedasticity was violated. The model was found to be significant ( $R^2 = .036$ ,  $F(2,314) = 6.35$ ,  $p = .002$ ), and both gender ( $p = .003$ ; females scored higher than males) and educational level ( $p = .052$ ) were significant predictors. Although addition of the predictors Antillean friends and Moroccan friends did not improve the model, the model was still significant ( $R^2 = .049$ ,  $F(4,341) = 4.34$ ,  $p = .002$ ), with gender remaining a significant predictor ( $p = .007$ ).

**Table 8.** Hierarchical regression analyses in the Dutch group for predicting Antillean, Moroccan and Western mental state reading

Predictor	Model					
	Antillean RME		Moroccan RME		Western RME	
	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$
Step 1	.02		.05*		.04*	
Gender		-.07		-.19*		-.16*
Educational level		.11		-.11		.10
Step 2	.04*		.02*		.01	
Gender		-.06		-.16*		-.15*
Educational level		.10		.06		.08
Antillean friends		-.21*		--		-.09
Moroccan friends		--		-.16*		-.05
Total $R^2$	.06		.07		.05	.05
<i>n</i>	165		178		342	

+  $p < .10$ , \*  $p < .05$ , \*\*  $p < .001$

## DISCUSSION

### Cross-cultural Mental State Reading and the In-group Advantage

The first aim of the current research was to gain insight into cross-cultural mental state reading in Antillean-Dutch, Moroccan-Dutch and Dutch young adults. Contrary to expectations, Antillean-Dutch individuals read Antillean and Western eyes equally well, and Moroccan-Dutch individuals performed equally well at reading Moroccan and Western eyes. However, the Dutch group did show an advantage in reading Western eyes compared to reading Antillean or Moroccan eyes. This presence of the in-group effect in the Dutch group indicates the experience of cultural fluency: a higher familiarity amongst Dutch individuals with the Western, compared to the Antillean or Moroccan, style of mental state expression enhances their mental state reading of this culture (Elfenbein & Ambady, 2003; Oyserman, 2011; Oyserman, 2017). The in-group effect confirms that reading mental states in Western faces differs from reading mental states in Antillean and Moroccan faces, indicating the presence of a difference in style between these specific cultures. Previous cross-cultural Asian and Western comparisons of emotional expression styles (Adams et al., 2010; Bjornsdottir &

Rule, 2016) are extended by this finding. In addition, it further confirms the existence of cultural diversity in the facial expressions of emotions (Jack, Blais, Scheepers, Schyns, & Caldara, 2009; Jack et al., 2012). However, it would be valuable to further examine directly whether the variation in emotional expression style in the current groups is related to variation in interpersonal goals and values that are part of their cultural mindsets (De Leersnyder, 2017; Elfenbein & Ambady, 2003; Jack et al., 2012; Oyserman, 2011), for instance, by priming these mindsets (Oyserman & Lee, 2008).

Absence of the in-group effect in Antillean-Dutch and Moroccan-Dutch individuals appears to be due to their relatively high ability to read both eyes. This within average performance (Fernández-Abascal et al., 2013; Prevost et al., 2014; Vellante et al., 2013; Yildirim et al., 2011) of both groups on both types of mental state reading suggests that the Western as well as Antillean or Moroccan mindset is currently or frequently activated. This dual orientation in itself is, specifically in the Moroccan-Dutch group, in line with a high orientation towards both the Dutch and Moroccan culture in socio-cultural factors (Stevens et al., 2004) and emotion regulation (Novin & Rieffe, 2011; Novin et al., 2012). Furthermore, for both groups, these patterns are promising in terms of adaptation. The experience of cultural fluency with both the Western and Moroccan or Antillean expression style in mental state reading would enable competent navigation through different intercultural social interactions. Yet, it is important to further specify in which contexts exactly this cultural fluency with either mindset is experienced. The cultural mindset framework stipulates that mindsets can be more accessible because of frequent or recent exposure, but also that immediate contextual cues contribute to a current mindset activation (Oyserman, 2017). The emotional patterns of bicultural individuals have been shown to be more oriented towards the majority culture in a situation where this culture is more emphasized (e.g., at work [De Leersnyder, 2017] or with friends [Novin et al., 2012]), and yet oriented towards the original culture in a situation where this culture is more at the foreground (e.g., at home [De Leersnyder, 2017]). Consequently, the presence of such cues during the present data collection can be considered. For instance, the data collection took place at home, possibly activating the Antillean or Moroccan mindset, but the interviewers mostly had a Dutch background, activating perhaps a Western mindset. In the present situation, therefore, both mindsets might indeed have been at the foreground. Future studies can attempt to investigate cross-cultural mental state reading while deliberately placing Antillean-Dutch and Moroccan-Dutch individuals in situations that emphasize the majority or the original culture.

Acculturation processes are inherently embedded in the overall societal climate (Verkuyten, Thijs, & Stevens, 2012), and the perceived majority attitudes (Hong, Morris, & Benet-Martinez, 2016) and discrimination (Jasinskaja-Lahti, Mähönen, & Liebkind, 2012) towards specific groups. Therefore, when factors

such as (social) adaptation and wellbeing are being considered in the study of acculturation, studies should, in addition to the immediate context such as the home environment, also take into account the larger context of society. For instance, stereotypes about a bicultural group can influence how individuals from the majority group interpret their emotional expressions (Kommattan, Jonas, & Fisher, 2017). This can directly impact cross-cultural interactions as well as the extent to which competent social navigation, and adaptation, is experienced.

### **Acculturation and Cross-cultural Mental State Reading**

The second aim of this research was to relate cross-cultural mental state reading to self-reported psychological and behavioral acculturation. The considerations above concern immediate contextual cues (such as the environment in which an interaction takes place) which impact cultural mindset activation. Yet, these socio-cultural acculturation factors reflect the more general daily presence of contextual cues (such as the frequency of specific interactions), which can impact the accessibility of or familiarity with a mindset as well. In none of the three groups, however, did the indicators of daily familiarity with a certain culture, in the form of identification, language or friends, consistently and in the expected direction explain variation in the ability to read mental states of that culture. However, these findings should be interpreted with caution because of the different (and sometimes quite small) sample sizes of the models, which, in addition, were not compared directly. Despite these limitations, which will be discussed more extensively below, a few potentially promising effects and patterns were present.

In the present study, two distinguishable roles for language appeared. Moroccan-Dutch individuals performed better at both Moroccan and Western mental state reading when they reported that they used the Dutch language more often with close others. This finding is not surprising given the reliance of the RME upon verbal abilities (Yildirim et al., 2011), and its confinement to the Moroccan-Dutch group could be related to their overall lower level of Dutch language skills (Ooijevaar et al., 2016). Variation in daily language use might not affect performance when the overall level of the language is high enough. This role of language concerns an effect on mental state reading performance through the verbal component of the task. The relation between higher use of Papiamentu and lower Western mental state reading in Antillean-Dutch individuals, however, suggests a negative impact of activation of the Antillean mindset for Western mental state reading. A similar indirect effect of exposure to a mindset was found in East-Asian individuals living in Canada, whose identification with the Asian culture negatively predicted their Western mental state reading (Bjornsdottir & Rule, 2016). From the perspective of acculturation theory, this indirect effect is interesting. Acculturation is explicitly approached bi-dimensionally, taking into account orientation towards both cultures and not necessarily expecting that when orientation towards one culture increases, orientation towards the other decreases

(Sam & Berry, 2010). Moreover, such an association reflects a specific acculturation strategy which possibly includes the experience of incompatibility between both cultures (Cheng, Lee, & Benet-Martinez, 2006; Ward, 2013). To understand acculturation in Antillean-Dutch individuals, on whom not many insights exist, future studies can look further into these type of patterns, especially since this suggested incompatibility is not in line with the general cross-cultural mental state reading patterns of this group (which indicate relatively high compatibility with both cultures). Qualitative research can be valuable here, as it could potentially reveal the nuanced underlying experiences of bicultural individuals that are not captured by quantitative measures (Barker, 2015).

The only other effect that involved the expected predictors concerns a rather puzzling finding regarding the friends of the Dutch participants. Having Antillean or Moroccan friends was, unexpectedly, related to lower Antillean and Moroccan mental state reading while being unrelated to Western mental state reading in the Dutch participants. Both this negative relation itself (given what is known on the positive relation between Theory of Mind skills such as mental state reading and friends or social behavior [Slaughter, Imuta, Peterson, & Henry, 2015]) and the fact that this relation is restricted to Antillean and Moroccan mental state reading are difficult to interpret. Taking into account the limited meaning of the factors friends and the absence of information on friends with other backgrounds, any interpretation seems too speculative here. More complete information should be gained on Dutch individuals' social lives, including at least the presence of friends with different backgrounds, and preferably, insights into the quality of these bonds. In addition, other factors can be considered as indicators of exposure to a different culture for a specific majority group. This can include detailed information on individuals' work or educational environment (where they might be in frequent intercultural contact, even when they are not friends with their coworkers or peers) or on the exposure they obtain through media use. Although this finding was not of primary interest, in both Antillean-Dutch and Moroccan-Dutch individuals, a higher educational level was beneficial only for Western mental state reading. This finding in itself could indicate that Western mental state reading, despite the equally good performance, is after all somewhat more difficult and less part of the default mindset (Oyserman, 2011; Oyserman, 2017); which makes it susceptible to variation in educational level. Cultural fluency in reading eyes of their own culture, which requires less effort, might become apparent not only in performance level but also in how robust the performance is. Findings on cross-cultural mental state reading at the neural level also suggest that reading the eyes of the other culture shows the most variation; this indicates that the in-group effects stem mostly from a failure to read the other culture's eyes and not from enhanced reading of the own culture's eyes (Adams et al., 2010). Finally, it should be taken into account that the current bicultural groups were all second-generation immigrants who were relatively highly oriented towards both

cultures. It is possible that when variability in these orientations increases, differences in acculturation become more relevant to understanding cross-cultural mental state reading.

### **Mental State Reading and Acculturation**

Two final points can be raised concerning the construct of mental state reading and its measurement with the RME. First, in understanding cross-cultural differences and acculturation in mental state reading, our focus lies on its intuitive component of correctly inferring mental states from facial expressions. More precisely, we focus on the *emotional content* of these inferred mental states. This is, given the extensive line of research on culture and emotional expressions (Chen & Jack, 2017; Ekman, 1987; Marsh et al., 2002; Jack et al., 2009; Jack et al., 2012; Matsumoto et al., 2008; Safdar et al., 2009) and previous similar starting points (Adams et al., 2010; Bjornsdottir & Rule, 2016), a valid direction. However, it can be considered that cultural differences in mental state reading arise, in addition, within intuitively inferring mental states in the face. Faces are always part of a context, which consists of several different aspects, such as the rest of the body or other faces which are present (Matsumoto & Hwang, 2010). Cultural differences may be present in the extent to which the focus in emotion expression (and inference) lies on the face or on the context (Matsumoto & Hwang, 2010). Japanese individuals, for example, are more inclined to incorporate information from the social context when inferring facial emotional expressions than Western individuals (Masuda et al., 2008). Cultural habits such as these, possibly grounded as well in cultural framework aspects of personal interrelatedness and consequently communication styles, are likely to affect how familiar, and therefore enhanced, individuals are in reading mental states in the face in the first place instead of in reading mental states of their own culture specifically. This could be one of the explanations for the overall higher performance in mental state reading of Dutch individuals in the current research. Yet, within this overall higher performance, cross-cultural differences are still present, indicating that different mechanisms may be at work here.

The second point is that although mental state reading is promising as a subtle social tool, some questions have been raised about this construct and its measurement. A lack of consensus on the construct (Fernandez-Abascal et al., 2013; Johnston, Miles, & McKinlay, 2008) and incomplete reports on its validity and reliability (Fernandez-Abascal et al., 2013; Prevost et al., 2014) (including in samples with different cultural backgrounds) are important issues. More fundamental sources of criticism concern the reliance of the task upon static instead of dynamic facial expression and the fact that the task does not differentiate between posed and genuine emotions (Johnston et al., 2008). The latter is related to the fact that correct mental states in the pictures are based on consensus among the researchers involved in constructing the task (Johnston et

al., 2008), which is the case in both the original task (Baron-Cohen et al., 2001) and later adaptations (Adams et al., 2010), including that of the current research. In themselves these criticisms are important, but they can be partly dealt with by being aware of (and explicit about) the scope and limitations of the construct and task. With regard to the current research and future directions, these limitations, or characteristics of the construct and task, are most relevant when they interfere with cross-cultural differences in communication style or habits. The RME aims to specifically measure expressions in the eyes and does not take into account contextual information (Baron-Cohen et al., 2001). Because of the cultural difference in whether the context of a face is actually incorporated when inferring emotions (Matsumoto & Hwang, 2010), this deliberate characteristic of the task might impact its cultural validity. Future studies would benefit from specific reports on the (cultural) validity of the RME, as well as, complementary insights into other constructs or tasks that focus on the face in a context, for instance, in order to understand the role of culture and acculturation in social cognition.

### **Limitations and Conclusion**

In addition to these reflections on the RME and mental state reading, two interconnected limitations of the current research concern the acculturation measurements and the study sample. First, cultural orientation and possession of friends were assessed using only one item. Although these constructs have been measured with these single items previously (Stevens et al., 2004), they can be assessed more widely (by including whether the values are shared with both groups, the number of friends or frequency of contact) and more deeply (by adding experience of identification and quality of friendship). Second, unfortunately in this study, there was a substantial reduction in the number of Antillean-Dutch and Moroccan-Dutch participants for these measurements, on account of the participants skipping all the questions, specific questions or answering 'I don't know' to questions on cultural identification. This is problematic, especially in the Antillean-Dutch group, because of the resulting smaller sample sizes, but also because of a possible bias. Participants who feel uncertain or negative about these types of rather sensitive questions might be more inclined to skip them, which could have contributed to the relatively high orientation towards both cultures in our sample. Insisting that these questions be filled in might discourage participants altogether, but future research could take into account 'I don't know' answers (possibly as a specific strategy) as well attempt to infer (for example, by adding an open-ended question) why participants skipped these questions. Third, in all three cultural groups, the presence of individuals with a criminal background was slightly higher than can be expected in the general population. However, the proportions were comparable across groups and were not extreme, which makes it unlikely that this affected the findings. Finally, the data on sociocultural acculturation were

collected during an earlier wave of the project. It seems unlikely though that there were any changes in acculturation in these young adults, given that they have lived in the Netherlands their entire life.

The current research obtained insights into acculturation in bicultural as well as monocultural individuals in mental state reading, as well as its interplay with acculturation in socio-cultural factors cultural identification, language use and friends. This increases the knowledge on the working of cultural fluency in this socially highly relevant social-cognitive process in contexts other than Asian and Western comparisons. It appears important to be aware of, and address explicitly in the future, the impact of different contextual cues on this experience of fluency, in the form of immediate environments, societal contexts and frequency of daily contextual cues. Furthermore, the mechanisms associated with these different contexts might operate indirectly.

Finally, intertwined with studying different facets of acculturation is the use of different methods. The patterns of mental state reading are all the more meaningful since they reflect a directly measured skill that is not prone to biases of self-report. In addition to the two methods, self-reports and assessed skills used here, the intricate patterns of acculturation can be further understood by adding qualitative measures that can tap into the exact mechanisms and experiences behind these patterns (Barker, 2015; Kim, Sarson, & Sarason, 2006). Finally, including the association with adaptation and wellbeing will contribute substantially to the full understanding of acculturation in bicultural and monocultural individuals.

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## APPENDIX A

### **Sample and procedure details of the pilot studies used for constructing the Antillean and Moroccan RME**

Participants of the pilot studies were recruited through the networks of the researchers as well as through snowball sampling. The participants included 18 Moroccan-Dutch participants (15 women) who were between 18 and 26 years old ( $M = 21.83$ ,  $SD = 2.33$ ) and 18 Antillean-Dutch participants (7 women) who were between 30 and 65 years old ( $M = 44.56$ ,  $SD = 12.04$ ) (only 14 participated in round 2). In the first round, the participants were presented with 36 images of Antillean or Moroccan eyes selected by the researchers. In both samples, participants were divided into two groups. Items were approved when at least 60% of the participants in both groups chose the correct mental state term (Adams et al., 2001, Baron-Cohen et al., 1997). Images that were not approved were replaced with new images that were obtained online, which were presented in a second round (and a third round for the Moroccan version) to the same participants. This resulted in the selection of 22 out of the original 36 items that were approved in both the Moroccan and Antillean version. Since one of the approved items was used as an example item, the three final versions consisted of 21 items with Antillean eyes, 21 items with Moroccan items and the original 21 Caucasian eyes.

## APPENDIX B

### Effects of the control factors gender, educational level and order

In the Antillean RME model, a main effect of gender was observed ( $F(1,290) = 6.15, p = .014, \text{partial } \eta^2 = .021$ ), with females ( $M = 15.37, SE = .15$ ) scoring higher than males ( $M = 14.81, SE = .19$ ). Second, there was a main effect of educational level ( $F(2,290) = 11.38, p < .001, \text{partial } \eta^2 = .073$ ). Pairwise comparisons showed that participants with a higher educational level scored higher ( $M = 15.71, SE = .16$ ) than participants with a medium educational level ( $M = 14.49, SE = .20, p < .01$ ) and participants with a low educational level ( $M = 15.06, SE = .26, p = .029$ ). Third, the order in which the RMEs were completed also had an effect ( $F(1,290) = 31.17, p = .038, \text{partial } \eta^2 = .015$ ). Participants who started with the Antillean version scored higher ( $M = 15.32, SE = .17$ ) than participants who started with the Western version ( $M = 14.86, SE = .16$ ). In the Moroccan RME model, there were main effects of gender and educational level. First, females ( $M = 15.14, SE = .18$ ) scored higher than males ( $M = 13.40, SE = .20$ ) ( $F(1,379) = 44.07, p < .01, \text{partial } \eta^2 = .10$ ). Second, the effect of educational level ( $F(2,379) = 14.01, p < .01, \text{partial } \eta^2 = .07$ ) was confirmed in pairwise comparisons. Participants with a high educational level ( $M = 15.07, SE = .19$ ) scored higher than participants with a medium educational level ( $M = 13.48, SE = .24, p < .01$ ) and participants with a low educational level ( $M = 14.27, SE = .31, p = .025$ ). Participants with a low educational level scored higher than participants with a medium educational level ( $p = .047$ ). Third, the order in which the RMEs were completed did not seem to have an effect ( $F(1,379) = .005, p = .941$ ).

## APPENDIX C

### **Acculturation patterns of Antillean-Dutch and Moroccan-Dutch young adults**

The self-reported socio-cultural acculturation factors (cultural identification, language and friends) of the Antillean-Dutch and Moroccan-Dutch can be used to gain insights in acculturation patterns of these two groups. It can be expected that in these psychological and behavioral acculturation factors Moroccan-Dutch individuals are oriented towards both the Dutch and Moroccan culture, with a somewhat higher orientation towards the Moroccan culture. Antillean-Dutch individuals can be expected to be highly oriented towards the Dutch culture. In comparison, their orientation towards the Antillean culture might be equally high or a little lower. Orientations are expected to correspond across the three acculturation factors (for example, when cultural identification with the Dutch culture is high, individuals are also likely to use the Dutch language often and report to have Dutch friends).

Acculturation patterns were processed separately for the Antillean-Dutch and Moroccan-Dutch group. In each group, correlations between cultural identification, language use and friends were computed to infer correspondence between these acculturation factors. Further, scores on cultural identification and language use concerning both cultures were compared, testing the expected higher orientation towards the Moroccan culture in the Moroccan-Dutch sample as well as the expected higher orientation towards the Dutch culture in the Antillean-Dutch sample.

In the Antillean-Dutch group, acculturation factors were highly intercorrelated (Table C1) (correlations between items were computed for the group of participants who completed both items, the smallest resulting group consisted of 79 participants). Participants' identification with the Antillean ( $M = 2.78$ ,  $SD = 1.20$ ) and Dutch culture ( $M = 3.03$ ,  $SD = 1.08$ ) did not differ (Wilcoxon signed-rank test used on all comparisons between acculturation factors due to non-normal distribution),  $Z = -1.14$ ,  $p = .255$ . Antillean-Dutch participants did use the Dutch language ( $M = 4.09$ ,  $SD = 1.11$ ) more often than Papiamentu ( $M = 2.32$ ,  $SD = 1.42$ ),  $Z = -5.47$ ,  $p < .001$ . The majority of the participants had Antillean (73.4%) and Dutch (91.4%) friends.

In the Moroccan-Dutch group as well, significant correlations appeared between acculturation factors (Table C2) (the smallest group included in the correlations consisted of 159 participants). Identification with the Moroccan culture ( $M = 3.45$ ,  $SD = .83$ ) was stronger than identification with the Dutch culture ( $M = 3.17$ ,  $SD = .95$ ), ( $Z = -3.34$ ,  $p = .001$ ) and the Dutch language ( $M = 3.96$ ,  $SD = .81$ ) was used more often than Arabic or Berber ( $M = 2.81$ ,  $SD = .96$ ) ( $Z = -8.70$ ,  $p < .001$ ). Participants had both Moroccan (94.6%) and Dutch (79.9%) friends.

**Table C1.** Intercorrelations (*df*) for acculturation factors in the Antillean-Dutch participants

Acculturation factor	1	2	3	4	5
1. Identification A					
2. Identification D	-.33*(80)				
3. Papiamentu	.65**(77)	-.38**(76)			
4. Dutch	-.42**(87)	.37**(87)	-.56**(85)		
5. Friends A	.57**(86)	-.31**(87)	.55**(84)	-.36**(95)	
6. Friends D	-.23*(87)	.09(87)	-.12(85)	-.04(96)	-.12(95)

\*  $p < .05$ , \*\*  $p < .01$

Note. All correlations are Spearman correlations except those with friends (factor 5 and 6), which are point-biserial correlations.

**Table C2.** Intercorrelations (*df*) for acculturation factors in the Moroccan-Dutch participants

Acculturation aspect	1	2	3	4	5
1. Identification M					
2. Identification D	.23**(157)				
3. Arabic/Berber	.21**(164)	-.05(159)			
4. Dutch	.03(166)	.21**(161)	-.36**(172)		
5. Friends M	.14(165)	.06(160)	.10(171)	-.11(174)	
6. Friends D	-.22**(165)	.17*(160)	-.18*(171)	.07(174)	.19*(174)

\*  $p < .05$ , \*\*  $p < .01$

Note. All correlations are Spearman correlations except those with friends (factor 5 and 6), which are point-biserial correlations.

These findings show that both bicultural groups are relatively highly oriented towards both cultures. Identification with the Moroccan culture is somewhat higher in Moroccan-Dutch individuals, while the Antillean-Dutch group reports more frequent use of the Dutch language. Most interestingly however, are the distinct patterns shown in the combination of orientations towards both cultures. At this next level of understanding acculturation patterns by examining the combination or management of cultural orientations, the bicultural groups of the current research show two management styles similar to previously identified approaches (Cheng, Lee, & Benet-Martinez, 2006; Hong et al., 2016; Van Oudenhoven & Benet-Martinez, 2015). The Antillean-Dutch participants show the consistent tendency to be either more strongly directed towards the Dutch or towards the Antillean culture. When they feel more Dutch, they feel less Antillean, and when they feel more Antillean, they use Papiamentu less frequently and less often have Antillean friends, in line with the management style of experiencing the two cultures as oppositional and keeping them separate in daily life (Cheng et al., 2006; Ward, 2013). Moroccan-Dutch individuals show a quite different, more blended and flexible pattern, characterized by combining and highlighting

different aspects of both cultures depending on the specific domain. When individuals in this group feel more Moroccan, they also feel more Dutch, and when they have Moroccan friends they also have Dutch friends. At the same time however, more frequent use of the Dutch language implies less frequent use of Arabic or Berber, and feeling Moroccan more strongly implies less often having Dutch friends and speaking Arabic or Berber more frequently. This management style implies the experience of both cultures as compatible and of being part of a blended culture (Cheng et al., 2006; Ward, 2013).

Although this sharp distinction between management styles of the current bicultural groups is insightful in itself, most surprising are the specific styles these groups adopt. A blended strategy would seem more likely in Antillean-Dutch individuals, since they would be alternating between and combining aspects of two cultures which have been described as relatively close (De Valk & Billari, 2007; De Valk & Liefbroer, 2007; Merz et al., 2009; Stupar et al., 2014). Interestingly, the unexpected strategy of the current Moroccan-Dutch individuals has been identified before, in a recent focus group study with 40 Moroccan-Dutch young adults. They describe their 'hybrid identity', which consists of different identities related to specific aspects of their life and associated with either the Moroccan culture (participating in holidays at home) or Dutch culture (speaking the Dutch language) (Sterckx & van der Ent, 2015). This strategy employed by present young Moroccan-Dutch individuals, different from the earlier noted consistent patterns in this group (Stevens et al., 2004), might be related to their age, generational status, or other current influences or circumstances. The young adults in the focus group mention the influence of the attitude of the Dutch majority, which they experience as a denial of their Dutch identity while imposing negative associations with their Moroccan identity. For them this contributes to a response of proudly emphasizing their Moroccan identity. Recent acculturation research confirms such mechanisms related to the societal climate (Verkuyten et al., 2012), perceived majority attitudes (Hong et al., 2016), and discrimination (Jasinskaja-Lahti et al., 2012). Bicultural groups can react differently to these phenomena, including by overemphasizing or redefining a denied identity (Hong et al., 2016). It is possible that such mechanisms and reactions operate in the Antillean-Dutch group, contributing to redefined, more distinct Dutch and Antillean identities. Future research could further try to unravel these processes by taking the ways in which the Antillean-Dutch and the Moroccan-Dutch group are embedded in society into account. The more immediate situational embeddedness of these behavioral and psychological patterns also needs to be explored. Similar to the emotional patterns, it can be specified for instance how individuals identify with both cultures when they are in a home or in a work environment. Finally, promising here is the addition of qualitative research such as focus groups, which can reveal nuanced, detailed underlying experiences of bicultural individuals not captured by quantitative measures (Barker, 2015).