

Cultural neuroscience and the category of race: the case of the other-race effect

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Abstract The use of the category of race in science (in relation to humans) remains controversial. During the last few years there has been a lively debate on this topic in the field of a relatively young neuroscience discipline called *cultural neuroscience*. The main focus of cultural neuroscience is on biocultural conditions of the development of different dimensions of human perceptive activity, both cognitive or emotional. These dimensions are analysed through the comparison of representatives of different social and ethnic groups. In my article, I present arguments supporting these two hypotheses: (1) the other-race effect understood as an individual, distinct effect does not exist. It is rather an exemplification of a much broader phenomenon which I call *the unfamiliarity homogeneity effect*. It includes not only problems with differentiation and recognition of faces of representatives of other ethnic groups, but also covers similar recognitional difficulties (e.g. recognition of members of other- social groups, other languages or even certain sounds and objects); (2) The race-based terminology and categories are used in cultural neuroscience research in a vague and inconsistent manner. Such an approach distorts the science both in empirically and conceptually significant respects. The unfamiliarity homogeneity effect is an example of such a situation: narrowing it to the other-race effect makes it difficult to analyse in a wider context crucial for its understanding.

Keywords Other-race effect · Cross-race effect · Unfamiliarity homogeneity effect · Cultural neuroscience · Race · Biocultural constructivism

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1 Introduction

The use of the category of race in science (in relation to humans) is particularly controversial among researchers, who are highly sensitive to any signs of ethnocentrism (Martínez Mateo et al. 2012). On the one hand, ‘race’ is considered a purely social construct which cannot be justified within a biological perspective (Lewontin 1972). On the other hand, research in genetics (Laland et al. 2010), the neurosciences¹ (Chiao and Ambady 2010; Han et al. 2013) or pharmacology (Harty et al. 2006; Yasuda et al. 2008) points out various differences between ethnic groups conditioned by both environmental and socio-cultural factors. A similar discrepancy in thinking about the category of race can also be noticed in some of its definitions from the Oxford Dictionary of English. Here, race is defined both as ‘each of the major divisions of humankind, having distinct physical characteristics’, as well as ‘a group of people sharing the same culture, history, language etc’. (<http://www.oxforddictionaries.com/definition/english/race#race-2>). Thus, the category of race can clearly be seen to be imprecise and entangled in various political, historical and economic contexts.²

Like the fields above, the use of the concept of race is just as controversial in *cultural neuroscience*. Cultural neuroscience (CN) is a specific field in the neurosciences developed within a research programme called *biocultural constructivism* (BC). The focus of cultural neuroscience is upon the biocultural conditions of the development of different dimensions of human perceptive activity, both cognitive and emotional. These dimensions are analysed through the comparison of representatives of different social and ethnic groups. One example of research in this area, which is of the utmost relevance today [in our troubled times provoking mass migrations] is the *other-race effect* which, in brief, consists of difficulty in the differentiation and recognition of the faces of representatives of other ethnic groups.

The purpose of this article is to present arguments supporting two hypotheses:

- (1) The first of these is that the other-race effect (ORE), understood as an individual, distinct effect, does not actually exist. It is rather an example of a much broader phenomenon, which I call the *unfamiliarity homogeneity effect* (UHE). This includes not only problems with the differentiation and recognition of the faces of representatives of other ethnic groups, but also covers similar difficulties

¹ I use form *neurosciences* to emphasize the pluralist character of neuroscience.

² The publication of a book by Nicholas Wade entitled *A Troublesome Inheritance: Genes, Race and Human History* (Wade 2014) has recently unveiled the emotions related to the category of race in scientific circles. In his book, Wade presents a number of arguments meant to show that human races exist for real, and that genetic differences between the races (e.g. various IQ levels) shape visible social phenomena, such as the economic success of the representatives of the white race. The book has caused strong reactions among some researchers such as Graham Coop, Michael Eisen, Rasmus Nielsen, Noah Rosenberg and Molly Przeworski, who work in the fields of population genetics. They all oppose the idea of using their research results to prove Wade’s theses. An open letter was published in *The New York Times* signed by over hundred and forty scientists who declare that none of their research results support Wade’s ideas. (<http://cehg.stanford.edu/letter-from-population-geneticists/>). However, a thesis that race categories have no scientific grounds does not mean that there are no biological differences between humans. Nevertheless, these differences cannot be defined by the common understanding of the category of race and they are not fully genetically determined.

relating to other social groups, languages, sounds and objects, whose recognition we are not specialised in. What is thus evident is that ORE is consequently not eliminated, but rather reduced to one of the number of effects occurring within UHE. And this phenomenon still requires an in-depth analysis associated with the study of the relationships existing within and between ethnic groups. However, its appropriate description (as one of the similar effects resulting from unfamiliarity with the perceived object) should allow its better understanding;

- (2) The second hypothesis is that the race-based terminology and categories used in cultural neuroscience research are vague and uneven. Such an approach distorts the science, in empirically and conceptually significant ways. The unfamiliarity homogeneity effect is an example of such a situation: narrowing it to the other-race effect makes it difficult to analyse in a wider context, which is crucial for its correct characterisation.

The article, based on the outline above, is thus divided into two parts. The first presents the research on the other-race effect. It also introduces main theoretical bases of cultural neuroscience and discusses some criticism on the use of the category of race in this field of science. The second part presents arguments supporting the thesis that the other-race effect is just one of the examples of the unfamiliarity homogeneity effect. It also claims that a precise conceptual analysis of the terms used in cultural neuroscience (especially such troublesome terms like “race”) is necessary in order to avoid future ambiguities and inconsistencies.

2 Other-race effect and the development of cultural neuroscience

2.1 Cultural neuroscience: main goals and assumptions

Cultural neuroscience (CN) can be defined as “a theoretical and empirical approach to investigate and characterize the mechanisms by which [the] hypothesized bidirectional, mutual constitution of culture, the brain, and genes occurs” (Chiao et al. 2010, p. 356). In other words, CN is centred on mutual interaction between these three elements (culture, the brain and genes) and tries to investigate them using methods developed and applied by neuroscientists, genetics, psychologists and anthropologists. However, researchers in cultural neuroscience do not concentrate on individual differences, as these are the domain of neuroanthropologists. Instead, they aim at answering the following questions relating to the levels of social groups or populations:

- (1) How do certain cultural phenomena (such as beliefs and values) influence behaviour, as well as neural and genetic processes?;
- (2) How do neurobiological and genetic mechanisms facilitate the creation and transfer of cultural phenomena? (Chiao et al. 2010, p. 356).

The basic theoretical assumption which forms the starting point for the analysis of the above issue is biocultural constructivism (BC), according to which the brain and culture constantly and mutually constitute, as well as determine, each other (Baltes et al. 2007, p. 15). This is mainly a result of the fact that the network of connections

between neurons (and, in a sense, the structure of the human brain) is not genetically pre-programmed but rather co-shaped by environmental stimulation such as, for example, individual socio-cultural experience and surroundings. Moreover, according to biocultural constructivism we should abandon the view of cultural evolution seen as a period in human evolution that began at a particular point of biological evolution. We should rather treat our species as a result of complicated biological and social processes (Ramirez-Goicoechea 2006, p. 292). Thus, the course of ontogenetic development is conditioned genetically, as well as environmentally and culturally, which leads to the disapproval of radical cultural, genetic and neural determinism.

Most of the research in cultural neuroscience deals with the comparison of the influence of social and cognitive behaviours on the brain structures of culturally differentiated groups of people (e.g., cultural individualism vs. collectivism, westerners vs. easterners, religious vs. non-religious people, etc.). Some of these studies focus on differences in the processing and interpretation of information between the representatives of different races. Most of them are studies based on the achievements of the neuroscience of race, dealing with such phenomena as the other-race effect (ORE) (Ito and Bartholow 2009; Kelly et al. 2007a), ingroup favouritism (Brewer 2007), judging mental states and activating attitudes (e.g. empathizing with one's own- and other-group members) (Marsh et al. 2003; Xu et al. 2009).

2.2 What is *Other-race effect*?

The other-race effect, also known as the cross-race effect/bias, other-race bias or own-race bias, is the effect which consists of the difficulty in the differentiation and recognition of the faces of representatives of other ethnic groups (essentially it is about the impression that 'they all look alike to me'). However, despite the apparent impression that ORE is defined in a rather precise manner, it happens that different phenomena are referred to by this term. Let us examine a few examples, relevant to the proposed arguments:

- (1) As mentioned above, ORE is likewise known as the cross-race effect (CRE) (Sporer 2001; Hugenberg et al. 2007). At the same time, the cross-race effect is both repeatedly narrowed down to "the tendency for eyewitnesses to be better at recognizing members of their own race/ethnicity than members of other races/ethnicities" (Bornstein et al. 2013, p. 1), or expanded to ingroup advantage/favouritism, manifested in several effects such as the other-race effect, racial bias in empathy etc. In the first case, eyewitnesses' problems with recognizing the faces of representatives of other-ethnic groups are just one of many examples of ORE, occurring in very specific circumstances. In the second situation, ORE is just one of many phenomena associated with in- and out-group biases.
- (2) ORE is sometimes treated as an own-race bias in the memory for faces (Meissner and Brigham 2001; Kubota and Senholzi 2011; Lucas et al. 2011). In a paper titled *Why Some Faces won't be Remembered: Brain Potentials Illuminate Successful Versus Unsuccessful Encoding for Same-Race and Other-Race Faces*, the authors state that "the *other-race effect* refers to the robust phenomenon wherein

recognition memory is less accurate for other-race faces than for same-race faces”³ (Lucas et al. 2011, p. 1). I think that although the trouble with remembering the faces of representatives of other ethnic groups relates to the difficulty in recognising people of other races, it is not the only phenomenon which occurs in ORE.⁴ The second one is referred to as the apparent homogeneity of the representatives of other ethnic groups. Therefore, one could deduce that ORE is a broader phenomenon than the effect of a racial bias in remembering faces. This is because the difficulties in distinguishing and in recognising the faces of representatives of other ethnic groups are equally important and cannot be reduced to problems with remembering the faces of representatives of other ethnic minorities.

- (3) Another approach is represented inter alia by Ge, Zhang, Wang, Quinn, Pascalis Kelly, Slater, Tian and Lee in their paper *Two faces of the other-race effect: Recognition and categorisation of Caucasian and Chinese faces* (Ge et al. 2009). They present the opinion that “the other-race effect is a collection of phenomena whereby the faces of one’s own race are processed differently from those of other races. One such occurrence is the own-race recognition advantage whereby own-race faces are recognised more accurately and faster than other-race faces” (Ge et al. 2009, p. 1199). Another one, according to the authors, is the other-race categorisation advantage, which consists of a faster and more accurate categorisation of other-ethnic group faces by race. This approach is consistent with the position of Natu, Raboy and O’Toole, who assume that “combined, studies of human perception and memory suggest both a categorization and recognition component of the other-race effect, with more efficient categorization of other-race faces ‘by race’ and less accurate ability to differentiate among individuals of other-races” (Natu et al. 2010, p. 1053).

In this paper I pay special attention to the aspect of the apparent homogeneity of representatives of other-ethnic groups which leads to difficulties with their differentiation (the previously mentioned, famous “they all look alike” characteristic of ORE). This effect is closely associated with other phenomena, such as problems with remembering other people’s faces, racial bias in empathy etc., although establishing the exact relationship between these requires further investigation.

2.3 Selected hypotheses about the causes of ORE

Scientific literature mentions a number of causes of ORE. They are often divided into two categories: social factors (e.g. the motivation of individuals and their emotional reactions in a defined social context), and cognitive factors. The most quoted example of the first group of factors is the stereotyping of people of other races by auto-categorizing them as members of another social group. In this approach, the

³ Another example is a short commentary *Knowing you beyond race: the importance of individual feature encoding in the other-race effect* (Kubota and Senholzi 2011) in which the authors describe ORE as a “memory bias indexed by superior memory for ingroup members of the perceiver’s race relative to outgroup members of a different race” (Kubota and Senholzi 2011, p. 1).

⁴ This is consistent with the third approach, which is presented below.

representatives of ethnic groups other than one's own are treated rather as objects representing a certain category (in this case, the ethnic group). At the same time, their individual physical attributes are overlooked and / or ignored and treated as irrelevant (Sporer 2001). In this case, ORE can be viewed as a sign of ethnocentrism, i.e. a tendency to divide people automatically into representatives of one's own race and other races, at the same time being favourable towards one's own racial group and discriminative towards other groups (Campbell and LeVine 1961; Kurzban et al. 2001).

As far as the impact of the second factor (the cognitive one) is concerned, it highlights the decreased ability to perceive the facial representations of other ethnic groups in a holistic way (Tanaka and Farah 1993; Michel et al. 2006). This approach shows that the perception of a novel face configuration in a facial composite interferes with the recognition of its constituent parts (Michel et al. 2006, p. 609). The person watching the faces of representatives of other ethnic groups perceives them in a more 'fragmented' way and is unable to 'make them whole'. This impedes the later identification of previously seen faces.

An example of a broader cognitive mechanism responsible for the occurrence of ORE is perceptual narrowing or perceptual expertise (Kelly et al. 2007a; Nelson 2001). Simply defined, it is based on the fact that in the course of their ontogeny, people have become experts in recognising objects that often appear in their environment. In other words, a baby begins its life with a versatile mechanism for the processing of people's 'faces'. In time, when the system receives more and more visual information, the baby 'adjusts' itself to process the categories of faces which are most common in the visual environment of the child (Kelly et al. 2009).

What is noteworthy, however, is that some of the latest research indicates the importance of both social and cognitive factors on the occurrence and development of ORE (Lucas et al. 2011; Young et al. 2012). There is also a problem with the precise separation of these components. As noted by Lucas, Chiao and Paller:

One key reason is that these contributing factors may not operate independently from one another. For example, perceptual expertise may play a causal role in determining the level of abstraction at which a face is categorized, such as whether the face is viewed primarily as an individual or primarily as a member of a certain racial group. In this way, perceptual and social factors may create and maintain the other-race effect through a cycle wherein perceptual homogenization encourages social homogenization. Indeed, perceptual training in ORE face recognition was recently found to reduce implicit social stereotyping to a degree that correlated across-subjects with levels of reduction in the other-race effect (Lebrecht et al. 2009). Thus, differences in face recognition that appear to be a direct result of perceptual expertise may partially or entirely reflect the downstream effects of social-cognitive processes. (Lucas et al. 2011, p. 2)

2.4 ORE in neuroscientific research

The development of tools for imaging brain activity (e.g. fMRI or EEG) has allowed us to look at the other-race effect from a neurobiological perspective, which confirms

the above observations. Experiments using neuroimaging tools have allowed the registration of the neural correlates of ORE: that is, the activity of two areas which are associated with facial perception, i.e. the lateral fusiform gyrus (connected with the encoding of the visual aspect of the face) and posterior cingulate cortex (PCC) (Ito and Bartholow 2009, p. 524). ORE is characterised by a greater activity in response to one's own- than other-race members in both the aforementioned areas. The activity of the lateral fusiform gyrus is modulated by experience, and thus most of the hypotheses treat ORE as a result of differences in contact/experience with members of other-race members. Even in big, western multicultural cities, nowadays there is a certain social segregation based on socioeconomic background, which can differ with respect to the level of the individual's experience with other-race members. This kind of 'contact hypothesis' predicts a close relationship between our exposures to other-race faces and the intensity of the other-race effect, also in line with the concept of perceptual narrowing (Hancock and Rhodes 2008; Kelly et al. 2007b; Sangrigoli and De Schonen 2004).

In addition, many recent studies on ORE have confirmed that this effect is acquired by people with time (Kelly et al. 2009; Sangrigoli et al. 2005; Sangrigoli and De Schonen 2004). In general, this effect does not appear among infants up to three months of age and slowly develops from that period to around nine months old. The 3-month-old children (Caucasian and Chinese) were able to recognise faces from four ethnic groups (Caucasian, Chinese, African and Middle Eastern). The 6-month-olds have more problems with this task and can recognise faces only from some of these groups (e.g. Caucasian and Chinese). Finally, the 9-month-olds can do this only with their own-race members (Kelly et al. 2007a, 2009). Interestingly, Sangrigoli and de Schonen published the results of an experiment in which even among the three-month-olds, the occurrence of ORE was observed, but it was easily 'removed' by showing these infants the faces of representatives of other different ethnic groups (Sangrigoli et al. 2005; Sangrigoli and De Schonen 2004).

As for social factors, the results of research (Devine et al. 2002; Ito and Bartholow 2009; Young et al. 2012) suggest that another important element modulating the activation of the fusiform gyrus is one's motivation. This situation is well illustrated by an experiment in which a group of Caucasian study participants were told that they had been randomly assigned to one of two competing, 'racially differentiated' teams. At the beginning of the study, participants had to learn to recognise the members of the two groups, i.e. to remember which person belongs to which team. Then they were shown pictures of the previously viewed people. It was observed that the activity of the fusiform gyrus depended on the team membership of the people whose photos were shown during the second stage of the experiment. This activity increased when the person tested was looking at photographs of 'new team mates' faces, but it decreased when they were the faces of 'rivals' in both cases, regardless of their race. There was a motivational factor which resulted from the fact that some of the people in the study obtained the 'buddy from the same team' status. This factor modulates the activity of the mechanisms processing information about the human face (Van Bavel et al. 2008). According to Ito and Bartholow, this suggests that a need of belonging to a group influences people's responses in studies concerning ORE. Researchers also notice that greater activity of the fusiform gyrus in the left hemisphere in response

to the photos of the same team members correlates with the ease with remembering these people (Ito and Bartholow 2009, p. 524). In addition, an analysis of the neuronal reactions to the faces of representatives of other ethnic groups (when the subjects were people who declared a strong desire to control prejudice) does not show the presence of the other race effect unless the faces were shown too briefly to be consciously detected (30 ms). This effect appeared only when the exposure time was reduced to thirty milliseconds, so the response to a stimulus was automatic (Ito and Bartholow 2009, p. 528).

These results are also consistent with the effects of empathy studies conducted by Xiangyu Zuo and Shihui Han (Xu et al. 2009; Zuo and Han 2013). Their reports suggest that cultural experience reduces the effect of racial bias in empathy, analysed on the basis of the neuronal activity of the subjects. Zuo and Han suggest that although they observed an increased empathy among adults watching the suffering of representatives of their own ethnic group (in comparison with the representatives of other groups) in laboratory conditions, this effect disappears or is significantly reduced when the tactics of the manipulation of group relationships or cognitive strategies are used (Sheng and Han 2012). In their study, Zuo and Han investigated whether ‘real-life’ experiences with representatives of other ethnic groups may reduce the racial bias ‘in empathic neural responses to other’s suffering’ (Zuo and Han 2013, p. 34). Their research shows that if individuals had a daily constant contact with other races, their neural reactions to other’s suffering did not differ significantly regardless of one’s race (no matter what the race of the person who experienced the suffering was).

The primary goal of the researchers mentioned above was to test whether in natural conditions cultural experience also determines the neuronal responses evoked during the observation of the suffering of representatives of different ethnic groups. Their results show that an ethnically diverse environment and frequent, prolonged contact with the representatives of other races significantly increase the level of empathy towards representatives of other ethnic groups, so it is possible to ‘learn’ the tendency to reduce racial bias (Zuo and Han 2013). Thus, a reasonable conclusion is that ORE is affected and modulated by cultural experience. It is already known that in the case of people educated outside their ethnic group (e.g. adoptive), the phenomenon of the so-called reversed other-race effect occurs (adopted children specialise in recognizing people in their immediate environment, so they lose the ability to distinguish between the representatives of their own ethnic group) (Sangrigoli et al. 2005). There are also studies indicating that among individuals living in ethnically diverse environments, the incidence of ORE is lower, or the effect does not occur at all (Brigham and Malpass 1985; Cross et al. 1971). It should be noted, however, that even in the case of frequent contact with representatives of other ethnic groups, in the absence of adequate socio-cultural factors (e.g. the motivation) ORE frequently occurs to a similar extent as in the case of monocultures. It follows that the perceptual narrowing hypothesis is not sufficient to accurately explain all the aspects of this problem (Lucas et al. 2011; Young et al. 2012, 2015).

As has been established, most of the researchers in the area of cultural neuroscience agree that ORE is modulated by socio-cultural factors. This is hardly surprising within the context of the basic tenets of bio-cultural constructivism. However, given the above analysis, the fact that many papers on ingroup favouritism treat ORE as an independent

distinct effect is thought-provoking. The reason for this inconsistency is probably partly due to the fact that the categories of “race” and “other-race effect” are often used in a vague and unclear manner. This causes a number of problems within the area of research on group biases in cultural neuroscience.

According to Marina Martinez Mateo⁵ imprecise or reckless usage of racial categories can result in ethnic and cultural groups being treated in cultural neuroscience (CN) as biologically determined, objective categories. For example, Juan Chiao, one of the leading researchers in the area of CN, defines race as a ‘type of social group membership that [...] share a common ethnic heritage and a subset of physical attributes (e.g. skin tone, facial, and body shape)’ (Chiao et al. 2008, p. 2172). Due to the fact that the concept of ‘ethnic heritage’ remains relatively enigmatic, what is left is the subset of biologically founded physical attributes:

Among these studies, universal explanations were most prevalently based on phenotypic similarities between participants and respective stimulus material [e.g. comparisons between black vs. white skin colours (Richeson et al. 2008), afrocentric vs. eurocentric features (Ronquillo et al. 2007) or between Japanese vs. Caucasian faces (Chiao et al. 2008)] and thus related to putatively biological criteria. The problem with this approach is that the outer appearance and, accordingly, the phenotypical definability of group membership form the main argument of group demarcation, ignoring underlying political and social processes. The biological existence of “races” is thereby assumed. (Martínez Mateo et al. 2012, p. 157)

The impression that CN researchers use the term ‘race’ in a biological-reductivist way is strengthened by the fact that when analysing such issues as ingroup favouritism or ORE, they sometimes use evolutionary explanations. Typically they interpret the human automatic response to representatives of other ethnic groups as an adaptation which helps us in dealing with potentially hostile members of foreign coalitions. For example, Wheeler and Fiske point out that:

People instantly categorize other people on the basis of social distinctions such as race, gender, and age. Such rapid and even automatic responses direct much of human cognition and behavior. The sensory and social world bombards people with information, so such adaptive shortcuts efficiently use their limited mental resources. Social cognition is no exception to this rapid, convenient type of response. (Wheeler and Fiske 2005, p. 56)

Indeed, if such mechanisms dedicated to the processing of information were related to ethnicity, there would have to be some selective pressure for this trait. But the idea that that people have some kind of special brain modules dedicated to the automatic detection of one’s ethnicity raises many questions—which will be presented in the

⁵ Marina Martinez Mateo together with different teams of researchers has already written several articles about cultural neuroscience. Her last article analyses the essentialist, postcolonial and eurocentric character of CN studies (Martínez Mateo et al. 2013).

second part of the paper.⁶ Still, as noted by Martínez Mateo, in many CN studies that analyse interracial relationships, one can find arguments based on the assumption that the tendency towards stronger visual identification or paying more attention to the recognition of the faces of people from the same ethnic group is an essential, automatic and uncontrollable feature of *Homo sapiens* (Martínez Mateo et al. 2013).

Interestingly, it occurs even in studies which point out the cultural conditions of ORE. On the one hand recently most CN researchers have rejected the idea that biological factors are the only factors affecting ingroup favouritism. They also point out the importance of education and cultural training to enable the weakening and elimination of group/ethnic bias (Sangrigoli et al. 2005; Zuo and Han 2013). For example in a very interesting paper already cited above called *The neural correlates of race*,⁷ (Ito and Bartholow 2009), the authors state that ‘race is a multifaceted social variable through which processes such as categorization, knowledge activation and motivation interact in complex yet subtle ways’ (Ito and Bartholow 2009, p. 530). Moreover, they also suggest that ‘although race relations will be affected by race-specific beliefs and feelings, the expression of bias will also be determined by an individual’s general regulatory abilities’ (Ito and Bartholow 2009, pp. 529–530).

In contrast to the above statements, Ito and Bartholow also claim that there are some specific neural correlates of race (dedicated, inter alia, to the identification of one’s race). If this is true, they evolved to automatically recognise particular features. Following this logic, there must be some universal, immutable criteria for ethnic differentiation. However, the only criteria they take into consideration in their article are physical characteristics, such as the colour of one’s skin. Researchers also suggest the following:

[...] the race effects reflect automatic encoding of, and orienting toward, racial category information. Importantly, sensitivity to race occurs regardless of whether participants are explicitly attending to race, to another social dimension (gender), or making person-based, individuating judgments, indicating that attention to race is obligatory (Ito and Bartholow 2009, p. 525).

This can be interpreted (as Martínez Mateo observed) as being supportive of the fact that racial identity is an ‘objective’, biological fact (Martínez Mateo et al. 2012, p. 153), and that we are evolutionarily equipped with its detectors and an automatic mechanism that causes us to react towards representatives of other races in a specific way and there is nothing that can be done about this.

⁶ As noted by Cosmides, Tooby and Kurzban: “Until recently, experiments on person perception had led to two unwelcome conclusions: (1) people encode the race of each individual they encounter, and (2) race encoding is caused by computational mechanisms whose operation is automatic and mandatory. Evolutionary analyses rule out the hypothesis that the brain mechanisms that cause race encoding evolved for that purpose.” (Cosmides et al. 2003, p. 173). Nevertheless, the tendency to treat race as a category which induces automatic and evolutionary conditioned responses remains very strong.

⁷ There is also an important article by Vaidehi Natu, David Radboy and Alice J. O’Toole titled “Neural correlates of own- and other-race face perception: Spatial and temporal response differences” (Natu et al. 2010).

Taking into consideration the fact that nowadays most humanists and natural scientists do not acknowledge the existence of human races,⁸ and that the term of ‘race’ is ideologically, historically and emotionally burdened, it is surprising that the word ‘race’ is frequently used in articles relating to cultural neuroscience in contexts where other terms seem more adequate (as happens in ORE). All of the concepts responsible for the biological bases of certain groups/categories of people can potentially help legitimise racist, xenophobic behaviours or ideologies. In order to expose the prescriptivist influence of similar descriptions, Martínez Mateo brings up an article by Hacking (1995), where Hacking observes that science is always placed in a certain social and historical context which defines and sets the scientific categories. As a result, science is not purely descriptive and it always reflects a specific point of view. The knowledge created by science is, then, a source of new questions and leads to the creation of new categories and fields of research (Martínez Mateo et al. 2012). At the same time, some categories of the natural sciences (even when used as tools to facilitate the description of certain phenomena) can be adopted by society. If the question refers to such ‘dangerous’ issues as race, any scientific studies that use race for the analysis of given features or behaviours only find grounds for doing so in social practice.

There are indications that the confusion regarding the use of ethnic categories in conjunction with ingroup and outgroup biases is caused by a number of reasons. First of all, during studies of people’s reactions to representatives of foreign groups, the category of race comes to mind easily since race is the most ‘obvious’ criterion for differentiating people. Its use can therefore seem to be the most practical and unquestionable solution. Moreover, issues such as the other-race effect have been investigated for the past forty years, and the terminology used in those studies has been accepted within scientific circles. It may also be the result of a lack of humanistic thought on the terminology used in analysed papers. Scientists working in the field of cultural neuroscience accept and support the position of bio-cultural constructivism, but at the same time they use terminology derived from evolutionary psychology, evolutionary biology, traditional neuroscience or genetics. This terminology is set in a theoretical context which automatically brings to mind the position of a genetical/biological reductionism, which results in an unnecessary conceptual muddle. I am convinced that conceptual analysis of the above problems can not only clarify the concept of ORE, but also help to develop future research in cultural neuroscience.

⁸ On a webpage of a 13-year-long project called Human Genome Project (1990–2003) one reads that “DNA studies do not indicate that separate classifiable subspecies (races) exist within modern humans. While different genes for physical traits such as skin and hair colour can be identified between individuals, no consistent patterns of genes across the human genome exist to distinguish one race from another. There also is no genetic basis for divisions of human ethnicity. People who have lived in the same geographic region for many generations may have some alleles in common, but no allele will be found in all members of one population and in no members of any other” (http://web.ornl.gov/sci/techresources/Human_Genome/elsi/minorities.shtml). Based on the results of the Human Genome Project, an interdisciplinary group of researchers from the University of Stanford published an open letter in 2008 entitled “The ethics of characterizing difference: guiding principles on using racial categories in human genetics”. Ten principles of using the category of race and ethnic grouping in scientific research were created in this letter (Lee et al. 2008).

3 The unfamiliarity homogeneity effect

3.1 Looking at ORE from a broader perspective

As indicated above, analysis of experimental studies and theoretical texts concerning ORE points to some confusion in the use of terminology and a theoretical inconsistency between researchers. First of all, the other-race effect is sometimes defined and characterised in different ways in different studies. Sometimes, *inter alia*, it is reduced to the issue of remembering the faces of representatives of other ethnic groups or to problems with the perception of these faces in a holistic manner and / or non-stereotypical (insightful) way. It so happens that the term “racial bias” describes the other-race effect, whilst on the other hand other-race bias is characterised by a number of different effects (such as the other race effect, racial bias in empathy and so on). All these effects that are manifestations of other-race bias, are sensitive to the same factors (cognitive and social). Therefore, a description of just one of these effects often contains references to the studies of the other ones.

Narrowing the described phenomena down to just ‘other-race bias’ raises a number of questions. Some researchers interpret it as ‘other-group bias’, pointing out the fact that a similar phenomenon occurs not only in relation to the representatives of other ethnic groups, but also within the same racial group. A study from 2008 by Edwin Shriver and his team reveals the presence of an effect analogous to ORE among representatives of the middle class when they encounter people who appear to be living in poverty. People resembling the ‘poor’ are automatically classified by middle class individuals as agents of unfamiliar groups (Shriver *et al.* 2008) and, consequently, such ‘poor’ people become harder to distinguish and recognise. In social psychology this phenomenon is called the other-group homogeneity effect. This is a tendency to perceive group members as more similar to each other (homogeneous) than is the case in reality, and as more uniform than the members of their own group (Aronson *et al.* 1997, p. 551). In other words, it is a tendency towards a stereotypical and uniform perception of ‘foreign’ groups (‘all men are the same’, ‘all models are the same’, ‘all blondes are the same’, etc.). However, this effect seems to be broader than ORE because in this case not only are the physical characteristics of a person stereotyped and homogenised, but also, for example, one’s character (‘all models are superficial’).

From the point of view presented in this paper it is also important to mention that ORE is often analysed in the context of studies of analogous auditory phenomena. There are experiments indicating that our ability to recognise speech sounds in infancy is very wide. However, it narrows in the course of our human development (Bosch and Sebastián-Gallés 1997; Kuhl 2000; Palmer *et al.* 2012). Monolingual infants who are up to six months old are able to recognise the speech sounds of all languages equally well, but between the sixth and twelfth months of age, these competences change as babies gain new experience. Beyond this point, infants become more specialised in the recognition of the speech sounds of their own language at the expense of the identifiable speech sounds of foreign languages. This happens due to the fact that (similarly to the case of the facial recognition of one’s own ethnic group) we specialise in identifying the sounds of our own language, but often we do not notice the differences between

the individual sounds of other languages (e.g. non-English people rarely hear the difference between the sound of the words ‘dessert’ and ‘desert’).

Using the data presented above as a basis, I propose a new approach to ORE which in the future may help to avoid many inaccuracies within the studies on this effect. I propose to consider ORE as an example of a much broader phenomenon, which I call the unfamiliarity homogeneity effect (UHE).

3.2 Unfamiliarity homogeneity effect: conceptual proposal and supporting data

I consider UHE to be the most general phenomenon which is a result of the mechanism of perceptual narrowing. It includes not only problems with the differentiation and recognition of the faces of representatives of other ethnic groups, but also similar difficulties for other social groups, languages, sounds and objects, whose recognition we are not specialised in. ORE is thus not simply replaced or eliminated, but rather reduced (by its “degradation” in the conceptual hierarchy) to one case among many other effects occurring within UHE (an unfamiliar ethnicity homogeneity effect). Moreover, it is no longer regarded as an independent effect, but it gains a place among a number of other effects, of which UHE is the most general. The unfamiliar ethnicity homogeneity effect still requires an in-depth analysis associated with the study of the relationships within and between ethnic groups. However, its appropriate description (as one of several similar effects resulting from unfamiliarity with the perceived object) allows a better understanding of it.

UHE covers all the instances where something we are not pre-acquainted with appears to be difficult to recognise (therefore, this relates to both the language and social groups, but when it comes to the description of human relations, the mechanism of perceptual narrowing may itself be insufficient). Due to the social character of certain cases of UHE, its analysis must take into account not only cognitive but also social factors (which determine social cognition), such as individual emotional reactions, knowledge and motivation.

Knowing the above premises we can identify at least three main groups of effects occurring within UHE: unfamiliar sounds homogeneity effects (languages, music genres and so forth), unfamiliar objects homogeneity effects (like cars and paintings) and unfamiliar group homogeneity effects (blondes, hipsters, Asians, poverty-stricken people etc.). The unfamiliar ethnicity homogeneity effect itself can thus be interpreted as an application of a wider effect (the unfamiliarity homogeneity effect) to a social situation (the unfamiliar group homogeneity effect), and restricting this situation to contacts between people with a different ethnic background (in this case, race is a criterion which defines the foreign group).

In order to support my hypothesis it should be highlighted that the effects analogous to ORE also occur between the representatives of different social groups (e.g. appointed due to social class, gender, age, occupation, etc.), regardless of their ethnicity. Moreover, this applies not only to visual stimuli, but it is also studied as a phonetic effect (studies on the recognition and distinction between sounds of foreign languages). Perhaps a similar phenomenon also occurs in other situations when we encounter something that represents a category of objects unknown to us (e.g. a techno

track or a renaissance painting, if you do not listen to this kind of music and do not know the history of art), as long as you do not learn how to distinguish and identify its elements. The difference is defined by the criterion of the social group or the group of items that are treated as ‘unfamiliar’⁹ (Tanaka and Pierce 2009).

This view is confirmed by research on the ‘expert’ perceptual processes (Gauthier et al. 1998; Wong et al. 2009). This research shows that the recognition of objects by people who specialise in a given field (e.g. recognising birds by ornithologists or models of cars by car enthusiasts) activates the fusiform gyrus mainly responsible for face recognition. Interestingly, as Abbate’s studies show, some patients with Capgras syndrome have problems with the identification of objects to which they can relate emotionally (e.g. their homes) (Abbate et al. 2012). Capgras syndrome is a condition where patients are convinced that the people whom they know (e.g. family members, friends or doctors) have been removed and replaced by completely different people who look like the ones the patients know. The problems with identification among such people point to the emotional build-up of not only the process of facial recognition, but also of some objects. Thus, an emotional barrier present in bias or in empathizing can also in some instances relate to objects.

As for intergroup relations, my hypothesis is, among others, supported by recent studies in the field of evolutionary psychology (Kurzban et al. 2001). The categorisation of people as members of their own or a foreign group is of paramount importance in the evolutionary perspective. Fast and automatic recognition of a representative of a foreign group whose aims are different and potentially dangerous could be essential for the individual to survive. Moreover, ingroup favouritism strengthens altruistic behaviours, solidarity and identification within a given group. As a result, ingroup cooperation becomes more effective (Tomasello 2015). It is believed that human cognitive structures are equipped by evolution with mechanisms which are effective at assigning others either to one’s own or a foreign group. Researchers used to think for a long time that race, along with sex and age, constitutes a basic criteria for such a categorisation. However, an analysis carried out some time ago by Kurzban, Tooby and Cosmides contradicts this hypothesis. These researchers claim that we do not actually possess any abilities strictly dedicated to racial recognition because of a simple reason—our ancestors hardly ever encountered representatives of other ethnic groups (Kurzban et al. 2001 p. 15387). Therefore, the emergence of a selection pressure leading to the creation of a cognitive apparatus specialised in racial recognition is rather improbable. According to Kurzban, Tooby and Cosmides, automatic racial categorisation is a sign of a more general mechanism created to recognise commonly understood *coalitional affiliation*. However, this tendency to categorise people can in certain social conditions or contexts be weakened or even vanquished (Kurzban et al. 2001 p. 15388). What is more, they also postulate that signs of group affiliation cannot be brought down to just the physical features shared by a given community.

⁹ Familiarity is a category which often occurs in the context of the research on group favouritism. J.S. Kim and his team suggests that familiarity with individual faces may mediate neural processing differences for the faces of representatives of one’s own- and other-ethnic groups (Kim et al. 2006). This is also in line with the work of Henson et al. (2000), Golby et al. (2001) or Kinzler and Spelke (2011).

Instead, these features can be completely independent of physical appearance.¹⁰ In order to prove their hypotheses, Kurzban, Tooby and Cosmides carried out a series of experiments during which they investigated subjects' sensitivity to the categories of the group affiliation of other people. In short, subjects taking part in the experiment were shown some scenes presenting conversations between members of two different groups and were later asked to describe their impressions. The next step was to match random fragments of sentences with the people who uttered them in the scenes previously presented. These experiments differed in respect to the common features differentiating the people who were discussed by the subjects of the experiment (in every group there were two white males and two black males). For example, in the first experiment the only indications for group affiliation were what the actors said, whilst in the second experiment the actors wore different coloured collars. The analysis of data from these experiments showed that in the second case the participants were less interested in the race of the men being watched. This happened because the participants realised quickly that the criteria of coalitional affiliation were what was said and the different coloured collars. Moreover, further trials of the experiment in this version showed that the subjects lost nearly all interest in the ethnic group of the described people. As Kurzban, Tooby and Cosmides point out:

What is most striking about these results is just how easy it was to diminish the importance of race by manipulating coalition—especially given the repeated failure over decades to find other means to influence racial encoding. The sensitivity of race to coalitional manipulation lends credence to the hypothesis that, to the human mind, race is simply one historically contingent subtype of coalition. Our subjects had experienced a lifetime in which ethnicity (including race) was an ecologically valid predictor of people's social alliances and coalitional affiliations. Yet less than 4 min of exposure to an alternative social world in which race was irrelevant to the prevailing system of alliance caused a dramatic decrease in the extent to which they categorized others by race. This implies that coalition, and hence race, is a volatile, dynamically updated cognitive variable, easily overwritten by new circumstances. (Kurzban et al. 2001 p. 15391)¹¹

It is important to appreciate the fact that the amount of research mentioned above also points to considerable plasticity of the described effects and the possibility of their regulation and/or minimization. This can be achieved by manipulating different factors which include motivation, interest in the unique features of a person that an individual deals with, and finally the impression of belonging to the same group (e.g. the same 'team').¹²

¹⁰ Tomasello's opinion is nearly the same. He thinks that group affiliation can be easily identified on the basis of specified conventions of cultural practices. (Tomasello 2015, pp. 149–150).

¹¹ There is a possibility that contrary to the conclusions of Kurzban, Tooby and Cosmides, what their data shows is that in experimental context the recognition and categorisation of people by race can be dominated by other competing factors. To exclude such a possibility further studies on this problem should be conducted.

¹² The above concept agrees with the results of experiments on superior memory for own- versus other-group faces conducted by VanBavel and Cunningham (2012). The foundation of their research was the thesis

The analysis described above is consistent with studies conducted by Kinzler and Spelke (Kinzler et al. 2007, 2009, 2011). These two researchers investigated the social preferences of infants concerning novel individuals. Their studies focused mostly upon social preferences based on language and accent, but they also tested infants' and young children's social preferences based on race. The key theoretical assumptions, which form the foundations of their hypothesis were:

- (1) Preference for people whose properties are most familiar occurs in infants and young children. Such a preference could be an adaptation as familiar people are more likely to be members of the same group/coalition (Kinzler et al. 2011, pp. 1–2);
- (2) In addition to familiarity, children's early social choices also indicate that the importance they grant to different social categories plays a significant role in shaping their behaviour;
- (3) Besides gender, age and race, language and accent are also valid predictors for social preferences and coalitional group membership (Kinzler et al. 2007, 2009).

Based on these premises, Kinzler and Spelke carried out three series of experiments focused on three different goals (Kinzler et al. 2007, 2009, 2011). They were all based on similar guiding principles, in brief the examined participants were infants and/or young children. Their social preferences were tested through simple tasks. They had to watch videos that presented two people who differed in language, accent or race (depending on the goal of the experiment). Afterwards, children had to decide which of the two previously viewed individuals they would like to interact with (depending on the age: take a toy from the chosen person—10 months; give them a toy—2.5 years; choose them as a future friend—5 years).

The first set of experiments (Kinzler et al. 2007) provided evidence of a social preference for representatives of one's native language group in comparison with the representatives of other language groups. This preference develops in early infancy. Moreover, the experiments indicated that familiarity plays a crucial role in the formation of this preference. In the conclusion of their paper they wrote as follows:

First, language provides a cue to social preferences, even in infants who have not begun to produce or understand speech. Second, the tendency to favor otherwise unfamiliar members of one's own social group begins to emerge early in human life and well before children begin to learn about the nature and history of social-group conflicts. The passage from infants' social preferences to adults' social conflicts may be long and circuitous, but such a path may exist and may explain, in part, why conflicts among different language and social groups are

Footnote 12 continued

that "social identities emerge rapidly under minimal conditions and can override biases that are built upon years of social exposure and perceptual expertise. More importantly collective identification and social role moderate facial memory—even in a minimal group context" (VanBavel and Cunningham 2012, p. 1574). Their findings support those conjectures, moreover, they confirmed the hypothesis that factors such as the intensity of identification with a group, the need of belonging to a certain community, individual motivation etc. alters the allocation of attention to own—and other-group faces and mediates subsequent biases in memory (VanBavel and Cunningham 2012, p. 1574). The impact of the above factors on the occurrence of the unfamiliarity homogeneity effect requires a thorough examination in the future.

pervasive and difficult to eradicate. Third, because human languages vary, and the native language must be learned, the tendency to make social distinctions is shaped by experience. Because language learning is especially adaptable early in development, social preferences also may be malleable at young ages. This early adaptability of preference formation for familiar characteristics of individuals may obtain for many potential indicators of social group membership. Attempts to reduce human social conflicts therefore may be enhanced by an understanding of their developmental origins. (Kinzler et al. 2007, pp. 12579–12580)

The second series of experiments (Kinzler et al. 2009) confirmed the abovementioned hypotheses about the significance of language and accent in the process of shaping children's social preferences. When they have to make a choice (such as the decision whom they would like to make friends with), children prefer contacts with people who speak their own, familiar, native language. What is more, they prefer speakers with a native accent rather than a foreign one. Finally, their choices were the same despite the ethnicity of the speaker. In the situation where race was pitted against accent, the children expressed a social preference for representatives of the other ethnic group who spoke with a familiar, native accent, over members of their own ethnic group whose accent was foreign (Kinzler et al. 2009, p. 629). Therefore, the researchers suggest that children's social preferences can surpass a reliance on visual information. This tendency to advantage accent over ethnicity, as they point out, is also consistent with evolutionary hypotheses about coalitional affiliations. Due to the fact that our ancestors rarely had contacts with representatives of other ethnic groups, spoken languages (especially accents) could be a much better predictor of group membership than the colour of one's skin (Kinzler et al. 2009, p. 630).

The last series of experiments carried out by Kinzler and Spelke was focused on the impact of ethnicity on social preferences in infants and young children (Kinzler et al. 2011). Researchers drew attention to the fact that if infants' earliest social preferences rely in some part on evolutionary determinants, then infants may not apply as much social importance to ethnicity as they do to language. This hypothesis was already partly confirmed by previously described studies conducted by Kinzler and Spelke. Further research on this subject shows that social preferences based on ethnicity emerge between 2.5 and 5 years of age and do not occur in younger children and infants. Although young infants' looking patterns differ when they look at representatives of their own- vs. other-ethnic group (they look longer at a person from a familiar ethnic group), it did not affect their social behaviour (Kinzler et al. 2011, p. 8). As the authors of the paper point out, this may result not only from the evolutionary conditions mentioned earlier, but also from the higher degree of familiarisation with language over race—infants hear their native language even before their birth. Moreover, it may also reflect an *essentialist bias* in which spoken language is treated by children as an 'inner' property, whereas race is considered as a less valid 'outer' piece of information (Kinzler et al. 2011, p. 9). In conclusion, Kinzler and Spelke suggest that their findings may indicate the potential malleability of early racial- biases depending on the degree of familiarity with certain stimuli.

The finding that race-based preferences emerge over childhood suggests that they may not be mandatory, but rather may emerge as a result of exposure to racially stratified societies in which race is often a marker of group membership. Children may be inclined to group the world into human kinds (Hirschfeld 1996), or ingroups and outgroups (Dunham et al. 2008); nonetheless, children may not view race as a mandatory variable by which groups are determined in all environments. Future research therefore should investigate the potential malleability of early social preferences as a result of exposure to diverse environments. The present research provides a note of optimism that later race based social preferences may not be a predetermined outcome of any and all social worlds. (Kinzler et al. 2011, p. 10)

3.3 Summary

To summarize Sect. 3 the following conclusions have been drawn:

- (1) There are some strong arguments supporting the thesis that problems with the recognition and differentiation of representatives of unfamiliar social groups should not be reduced to the issue of ethnicity. This is rather a form of the unfamiliarity homogeneity effect with respect to one's own ethnic group. UHE can be divided into three main groups of effects: the unfamiliar sounds homogeneity effect, the unfamiliar objects homogeneity effect and the unfamiliar group homogeneity effect. The unfamiliar ethnicity homogeneity effect itself can thus be interpreted as an application of a wider effect to a social situation in which race is a criterion that defines the foreign group.
- (2) There are indications which undermine the thesis that people have some kind of special brain 'modules' or specific 'neural correlates of race' designed for the automatic detection of one's ethnicity. One of them states that our ancestors rarely had any contact with representatives of other-ethnic groups, therefore there are no reasons to assume that a selective pressure for such specialised mechanisms occurred in the course of our evolution. However, to exclude such a possibility, an in-depth analysis of the questioned issue should be carried out.
- (3) Perceptual narrowing substantially modulated by socio-cultural factors (such as motivation, identification with a group and knowledge) is a basic mechanism that underlies the occurrence of the unfamiliarity homogeneity effect. It covers a very wide ranging spectrum of biases arising from the degree of one's specialisation in the processing of certain stimuli and the individual's socio-cultural experience;
- (4) Social categorisation as well as preferences based on familiarity may be ductile. The possibility of weakening and shaping them in the course of education requires further investigation.

Moreover, on the basis of the investigation into ethnic favouritism and the unfamiliarity homogeneity effect, I draw the following conclusions which can also help to clarify the problems with the use of the category of race in the research on group biases.

- (1) To date, no convincing evidence has been presented to support the thesis that separate classifiable biological subspecies (races) exist within modern humans.

People differ in terms of their biology, genetics, culture etc. These differences, however, are very subtle and go beyond the common concept of race. On the other hand, the term ‘race’ understood as a psychological and socio-cultural model is a relevant category requiring further investigation. We should learn as much as possible about both the biological and the cultural factors responsible for its formation. Removing the term ‘race’ from scientific language is not a good option because it would not eliminate all the manifestations of racism or xenophobia. It would even hinder the work on this subject. If, however, category or race/ethnicity is used in any study, it should be precisely defined and justified. The lack of consistency in the use of racial categories makes papers on this topic quite vague and internally discordant. In order to set some sort of universal directives clarifying such situations (if it is feasible at all), additional research needs to be done.

- (2) As long as establishing the existence of mechanisms dedicated to the recognition of ethnicity is a serious challenge, we should study the issue of group favouritism in a broader social framework. Narrowing it down to just contacts of representatives of other-ethnic groups distorts the image of the analysed problem and makes it difficult to study the unfamiliarity homogeneity effect in a wider context crucial for its understanding. For example, even if in certain situations the unfamiliarity homogeneity effect manifests as issues with the differentiation and recognition of other-race faces, it cannot be reduced only to interracial interactions as is sometimes done. The described mechanisms can be adequately characterised only through the proper identification of their character. In this regard, we should also scrutinise other phenomena examined so far in terms of interracial relationships. This does not mean, however, that the study narrowed to analyse specific biases should be abandoned. Quite the contrary—the problems with differentiation between representatives of other-ethnic groups (as well as other issues associated with interracial relations, racism etc.) should be studied with the highest attention whilst maintaining an adequate conceptual framework.

4 Conclusion

In this paper I have presented the argumentation in favour of two main theses. The first of them states that the other-race effect is an example of the unfamiliarity homogeneity effect, which itself is a result of a perceptual narrowing and social factors such as knowledge and individual motivation. I put forward a thesis that the consideration of this effect at the level of race leads to its erroneous interpretation—as an independent, spontaneous phenomenon, whilst a broader scope of research allows a much better grasp of its character. The second thesis states that an unjustified usage of vague racial categories distorts the scientific picture of intergroup relations. In order to understand mechanisms such as ingroup favouritism accurately, we need to expand the framework in which it is investigated and go beyond the matter of ethnicity.

Moreover, much of the research described in this article indicates that through proper education, we are able to shape our predispositions for exhibiting the unfamiliarity homogeneity effect. For example, not only being in an ethnically diverse environment reduces or eliminates the occurrence of the unfamiliarity homogeneity

effect, but also the appropriate cognitive exercises and motivation of an individual would bring a similar result.

The unfamiliarity homogeneity effect may not be the best concept, but it covers what is most important—situations where the unknown to us and unencountered seem to be uniform. We distance ourselves from them and/or we do not notice their uniqueness. If, however, we are sufficiently motivated, the unknown can become more familiar. It should be emphasized that this is not just an attempt to avoid the use of an ‘inconvenient’ word—‘race’. In my article I hope to have proved that the ethnic perspective is in this case too narrow and might be misleading.

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References

- Abbate, C., et al. (2012). Delusion of inanimate doubles: Description of a case of focal retrograde amnesia. *Neuroscience*, *18*(6), 457–477.
- Aronson, E., Wilson, T. D., Akert, R. M. (1997). *Psychologia Społeczna. Serca i umysły. Poznań: Zysk i S-ka*.
- Baltes, P. B., Reuter-Lorenz, P. A., & Röslér, F. (2007). *Lifespan development and the brain*. Cambridge: Cambridge University Press.
- Bornstein, B., H., Laub, C., E., Meisnerr, C., A., Susa, K., J. (2013). *Journal of Criminology*, 2013, Accessed October 15, 2015, from <http://dx.doi.org/10.1155/2013/745836>.
- Bosch, L., & Sebastián-Gallés, N. (1997). Native-language recognition abilities in 4-month-old infants from monolingual and bilingual environments. *Cognition*, *65*(1), 33–69.
- Brewer, M. B. (2007). The social psychology of intergroup relations: Social categorization, ingroup bias, and outgroup prejudice. Accessed January 24, 2015, from <http://psycnet.apa.org/psycinfo/2007-11239-030>.
- Brigham, J. C., & Malpass, R. S. (1985). The role of experience and contact in the recognition of faces of own- and other-race persons. *Cognition*, *41*(3), 139–155.
- Campbell, D. T., LeVine, R. A. (1961). A proposal for cooperative cross-cultural research on ethnocentrism. *The Journal of Conflict Resolution*, *5*(1), 82–108.
- Chiao, J. Y., & Ambady, N. (2010). Cultural neuroscience. *Handbook of cultural psychology*. Accessed January 25, 2015, from http://www.google.com/books?hl=pl&lr=&id=6VtDBFF7oPgC&oi=fnd&pg=PA237&dq=cultural+neuroscience&ots=RMaTktFr4H&sig=4lwb_qv_GjJkCWhLNwmuKv3fms.
- Chiao, J. Y., Hariri, A. R., Harada, T., Mano, Y., Sadato, N., Parrish, T. B., et al. (2010). Theory and methods in cultural neuroscience. *Cognition*, *5*(2–3), 356–361.
- Chiao, J. Y., Iidaka, T., Gordon, H. L., Nogawa, J., Bar, M., Aminoff, E., et al. (2008). Cultural specificity in amygdala response to fear faces. *Cognition*, *20*(12), 2167–2174.
- Coop, G., Eisen, M., B., Nielsen, R., Przeworsky, M., Rosenberg, N. (2015). Letter from population geneticists. Accessed April 15, 2015, from <http://cehg.stanford.edu/letter-from-population-geneticists/>.
- Cosmides, L., Tooby, J., & Kurzban, R. (2003). Perception of race. *Cognition*, *7*(4), 173–179.
- Cross, J. F., Cross, J., & Daly, J. (1971). Sex, race, age, and beauty as factors in recognition of faces. *Cognition*, *10*(6), 393–396.

- Devine, P. G., Plant, E. A., Amodio, D. M., Harmon-Jones, E., & Vance, S. L. (2002). The regulation of explicit and implicit race bias: The role of motivations to respond without prejudice. *Cognition*, 82(5), 835.
- Dunham, Y., Baron, A. S., & Banaji, M. R. (2008). The development of implicit intergroup cognition. *Trends in Cognitive Sciences*, 12, 248–253.
- Gauthier, I., Williams, P., Tarr, M. J., & Tanaka, J. (1998). Training “Greeble” experts: A framework for studying expert object recognition processes. *Cognition*, 38, 2401–2428.
- Ge, L., Zhang, H., Wang, Z., Quinn, P. C., Pascalis, O., Kelly, D., et al. (2009). Two faces of the other race effect: Recognition and categorisation of Caucasian and Chinese faces. *Cognition*, 38, 1199–1210.
- Golby, A. J., Gabrieli, J. D., Chiao, J. Y., & Eberhardt, J. L. (2001). Differential responses in the fusiform region to same-race and other-race faces. *Nature Neuroscience*, 4(845), 850.
- Hacking, I. (1995). The looping effects of human kinds. In D. Sperber, D. Premack & A. J. Premack (Eds.), *Causal cognition: A multidisciplinary debate* (pp. 351–394). New York: Clarendon Press.
- Hancock, K. J., & Rhodes, G. (2008). Contact, configural coding and the other-race effect in face recognition. *Nature Neuroscience*, 99(1), 45–56.
- Han, S., Northoff, G., Vogeley, K., Wexler, B. E., Kitayama, S., & Varnum, M. E. (2013). A cultural neuroscience approach to the biosocial nature of the human brain. *Nature Neuroscience*, 64, 335–359.
- Harty, L., Johnson, K., & Power, A. (2006). Race and ethnicity in the era of emerging pharmacogenomics. *Nature Neuroscience*, 46(4), 405–407.
- Henson, R. N. A., Shallice, T., & Dolan, R. (2000). Neuroimaging evidence for dissociable forms of repetition priming. *Science*, 287, 1269–1272.
- Hirschfeld, L. A. (1996). *Race in making*. Cambridge: MIT Press.
- Hugenberg, K., Miller, J., & Claypool, H. M. (2007). Categorization and Individuation in the cross-race recognition deficit: Toward a solution to an insidious problem. *Science*, 43(2), 334–340.
- Human Genome Project. (2015). Accessed January 2, 2015, from http://web.ornl.gov/sci/techresources/Human_Genome/elsi/minorities.shtml.
- Ito, T. A., & Bartholow, B. D. (2009). The neural correlates of race. *Science*, 13(12), 524–531.
- Kelly, D. J., Liu, S., Lee, K., Quinn, P. C., Pascalis, O., Slater, A. M., et al. (2009). Development of the other-race effect during infancy: Evidence toward universality? *Science*, 104(1), 105–114.
- Kelly, D. J., Quinn, P. C., Slater, A. M., Lee, K., Ge, L., & Pascalis, O. (2007a). The other-race effect develops during infancy evidence of perceptual narrowing. *Science*, 18(12), 1084–1089.
- Kelly, D. J., Quinn, P. C., Slater, A. M., Lee, K., Ge, L., & Pascalis, O. (2007b). The other-race effect develops during infancy evidence of perceptual narrowing. *Science*, 18(12), 1084–1089.
- Kim, J. S., Yoon, H. W., Kim, B. S., Jeun, S. S., Jung, S. L., & Choe, B. Y. (2006). Racial distinction of the unknown facial identity recognition mechanism by event-related fMRI. *Neuroscience Letters*, 397, 279–284.
- Kinzler, K. D., Dupoux, E., Spelke, E. S. (2007). The native language of social cognition. *PNAS*, 105(30), 12755–12580.
- Kinzler, K. D., Shutts, K., DeJesus, J., & Spelke, E. S. (2009). Accent trumps race in guiding children’s social preferences. *Cognition*, 27(4), 623–634.
- Kinzler, K. D., & Spelke, E. S. (2011). Do infants show social preferences for people differing in race? *Cognition*, 119(1), 1–9.
- Kubota, J., T., Senholzi, K., B. (2011). Knowing you beyond race: the importance of individual feature encoding in the other- race effect. *Frontiers in Human Neuroscience*. Accessed October 15, 2015, from <http://journal.frontiersin.org/article/10.3389/fnhum.2011.00033/full>.
- Kuhl, P. K. (2000). Language, mind, and brain: Experience alters perception. *Cognition*, 2, 99–115.
- Kurzban, R., Tooby, J., Cosmides, L. (2001). Can race be erased? Coalitional computation and social categorisation, *PNAS*. Accessed October 15, 2015, from <http://www.pnas.org/content/98/26/15387.full>.
- Laland, K., Odling-Smee, J., & Myles, S. (2010). How culture shaped the human genome: Bringing genetics and the human science together. *Nature Reviews Genetic*, 11, 137–148. *Proceedings of the National Academy of Sciences*, 104(30), 12577–12580.
- Lebrecht, S., Pierce, L. J., Tarr, M. J., & Tanaka, J. W. (2009). Perceptual other-race training reduces implicit racial bias. *PLoS ONE*, 4, 1–7.
- Lee, S. S., Mountain, J., Koenig, B., Altman, R., Brown, M., Camarillo, A., et al. (2008). The ethics of characterizing difference: Guiding principles on using racial categories in human genetics. *Proceedings of the National Academy of Sciences*, 9(7), 404.

- Lewontin, R. C. (1972). The apportionment of human diversity. *Proceedings of the National Academy of Sciences*, 6, 381–397.
- Lucas, H., D., Chiao, J., Y. Paller, K., A. (2011). Why some faces won't be remembered: brain potentials illuminate successful versus unsuccessful encoding for same-race and other-race faces. *Frontiers in Human Neuroscience*, 5. Accessed October 15, 2015, from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3057630>.
- Marsh, A. A., Elfenbein, H. A., & Ambady, N. (2003). Nonverbal "accents" cultural differences in facial expressions of emotion. *Proceedings of the National Academy of Sciences*, 14(4), 373–376.
- Martínez Mateo, M., Cabanis, M., de Loebell, N. C. E., & Krach, S. (2012). Concerns about cultural neurosciences: A critical analysis. *Proceedings of the National Academy of Sciences*, 36(1), 152–161.
- Martinez Mateo, M., Cabanis, M., Stenmanns, J., & Krach, S. (2013). Essentializing the binary self: Individualism and collectivism in cultural neuroscience. *Proceedings of the National Academy of Sciences*, 7, 289.
- Meissner, C. A., & Brigham, J. C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Proceedings of the National Academy of Sciences*, 7(1), 3.
- Michel, C., Rossion, B., Han, J., Chung, C.-S., & Caldara, R. (2006). Holistic processing is finely tuned for faces of one's own race. *Proceedings of the National Academy of Sciences*, 17(7), 608–615.
- Natu, V., Radboy, D., & O'Toole, A. J. (2010). Neural correlates of own- and other- race face perception: Spatial and temporal response differences. *Proceedings of the National Academy of Sciences*, 54, 2547–2555.
- Nelson, C. A. (2001). The development and neural bases of face recognition. *Proceedings of the National Academy of Sciences*, 10(1–2), 3–18.
- Oxford dictionary, *Race*. Accessed April 15, 2015, from <http://www.oxforddictionaries.com/definition/english/race#race-2>.
- Palmer, S. B., Fais, L., Golinkoff, R. M., & Werker, J. F. (2012). Perceptual narrowing of linguistic sign occurs in the 1st year of life. *Proceedings of the National Academy of Sciences*, 83(2), 543–553.
- Ramirez-Goicoechea, E. (2006). Cognition, evolution, and sociality. In N. Gontier, J. P. Bendegen, D. Aerts (Eds.), *Evolutionary epistemology, language and culture. A non-adaptationist, systems theoretical approach* (pp. 283–312). Dordrecht: Springer.
- Richeson, J. A., Todd, A. R., Trawalter, S., & Baird, A. A. (2008). Eye-gaze direction modulates race-related amygdala activity. *Group Processes Intergroup Relations*, 11, 233–246.
- Ronquillo, J., Denson, T. F., Lickel, B., Lu, Z., Nandy, A., & Maddox, K. B. (2007). The effects of skin tone on race-related amygdala activity: An fMRI investigation. *Social Cognitive and Affective Neuroscience*, 2, 39–44.
- Sangrigoli, S., Pallier, C., Argenti, A.-M., Ventureyra, V. A. G., & De Schonen, S. (2005). Reversibility of the other-race effect in face recognition during childhood. *Proceedings of the National Academy of Sciences*, 16(6), 440–444.
- Sangrigoli, S., & De Schonen, S. (2004). Recognition of own-race and other-race faces by three-month-old infants. *Proceedings of the National Academy of Sciences*, 45(7), 1219–1227.
- Sheng, F., & Han, S. (2012). Manipulations of cognitive strategies and intergroup relationships reduce the racial bias in empathic neural responses. *Proceedings of the National Academy of Sciences*, 61(4), 786–797.
- Shriver, E. R., Young, S. G., Hugenberg, K., Bernstein, M. J., & Lanter, J. R. (2008). Class, race, and the face: Social context modulates the cross-race effect in face recognition. *Proceedings of the National Academy of Sciences*, 34(2), 260–274.
- Sporer, S. (2001). The cross-race effect. Beyond recognition of faces in the laboratory. *Science*, 7(1), 170–200.
- Tanaka, J. W., & Farah, M. J. (1993). Parts and wholes in face recognition. *Science*, 46A, 225–245.
- Tanaka, J. W., & Pierce, L. J. (2009). The neural plasticity of other-race face recognition. *Cognitive, Affective, & Behavioral Neuroscience*, 9(1), 122–131.
- Tomasello, M. (2015). *A natural history of human thinking*. Kraków: Copernicus Center Press.
- Van Bavel, J. J., Cunningham, W. A. (2012). A Social Identity Approach to Person Memory: Group Membership, Collective Identification, and Social Role Shape Attention and Memory. Accessed January 10, 2016, from *Personality and Social Psychology Bulletin*, <http://psp.sagepub.com/content/38/12/1566>.
- Van Bavel, J. J., Packer, D. J., & Cunningham, W. A. (2008). The neural substrates of in-group bias a functional magnetic resonance imaging investigation. *Science*, 19(11), 1131–1139.

- Wade, N. (2014). *A troublesome inheritance: Genes, race and human history*. New York: The Penguin Press.
- Wheeler, M. E., & Fiske, S. T. (2005). Controlling racial prejudice social-cognitive goals affect amygdala and stereotype activation. *Neuropsychologia*, *16*(1), 56–63.
- Wong, A., Palmeri, T. J., & Gauthier, I. (2009). Conditions for face-like expertise with objects: Becoming a Ziggerin expert—But which type? *Neuropsychologia*, *20*, 1108–1117.
- Xu, X., Zuo, X., Wang, X., & Han, S. (2009). Do you feel my pain? Racial group membership modulates empathic neural responses. *Neuropsychologia*, *29*(26), 8525–8529.
- Yasuda, S., Zhang, L., & Huang, S. M. (2008). The role of ethnicity in variability in response to drugs: Focus on clinical pharmacology studies. *Neuropsychologia*, *84*(3), 417–423.
- Young, S. G., Hugenberg, K., Bernstein, M. J., & Sacco, D. F. (2012). Perception and motivation in face recognition: A critical review of theories of the cross-race effect. *Neuropsychologia*, *16*(2), 116–142.
- Young, S. T., Zhou, G., Pu, X., & Tse, C. (2015). Effects of divided attention and social categorization on the own-race bias in face recognition. *Visual Cognition*, *22*(9–10), 1296–1310.
- Zuo, X., & Han, S. (2013). Cultural experiences reduce racial bias in neural responses to others' suffering. *Culture and Brain*, *1*(1), 1–13.