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[Influence of Acculturation on Variances in Mate Preferences]

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Abstract

Acculturation is defined as the process by which an individual is influenced by their host culture, and by one's culture of membership (Berry, 2003). In the vast literature of mate preferences, cultural influences have been predominantly documented as cross-cultural variation (Marcinkowska et al., 2014; Little, Jones & DeBruine, 2011; Buss et al., 1990) or temporal differences within the same culture (Souza, Conroy-Beam & Buss, 2014). However, the process of acculturation has not been explored as a significant influencer of mate preferences. With the changing growth of multicultural people within a country in mind, the current study explored the influence of acculturation, as a process of psychosocial adjustment, on mate preferences.

Acculturation towards heritage and host (UK) culture was explored in 65 participants, 40 females and 25 males, who were asked to rate 40 Caucasian faces of men and women manipulated for facial symmetry, averageness, health and sexual dimorphism. Acculturation towards host culture was found to be significantly related to variance in mate preferences in females ($p = .01$). While, heritage culture acculturation was found to be significantly influential for males' mate preferences ($p < .05$). Language preference, as a behavioural indicator of acculturation, was only significantly related to females' mate preferences ($p < .05$). The presented results highlight the sex differences within acculturation to UK culture, and its influence on mate preferences. Such findings provide preliminary evidence to consider the interactive role of acculturation in future mate preference research.

INTRODUCTION

Culture is an integral part of understanding the deep social tapestry that surrounds human mating preferences. In the era of growing immigration, it is not odd for individuals to take a part of their native culture onto new soil. The culture that develops in the host nation, therefore, is an odd mix of both native culture and the culture of the host country (Hall & du Gay, 1996), with an amalgam of culture-sympathy and culture-clash.

In the field of mate preferences, the exploration of cross-cultural variation in desirable mate characteristics, has not been a novelty. Initiated by Buss and colleagues' (1990), the exploration of cross-cultural variation in mate preferences has yielded a rich and vibrant addition to the growing literature. Predominantly, two methodologically different paths have been taken. One, has explored preferred mate characteristics via a list of desirable traits such as 'intelligence', 'high social status' and 'beauty' (Buss et al., 1990; Simpson and Gangestad, 1992; Fletcher, Simpson, Thomas & Giles, 1999). The other, has explored preference for facial traits signalling attractiveness, such as health, symmetry, averageness and sexual dimorphism (Penton-Voak, Jacobson & Trivers, 2004; Little, Apicella & Marlowe, 2007; DeBruine, Jones, Crawford, Welling & Little, 2010). Both these methodologies supplement exploration of mate characteristics via social psychology and evolutionary biology perspectives, respectively. The current study has been inspired by and designed after careful consideration of the advantages and limitations present in such research studies.

While exploring cross-cultural variation in mate preferences, cultural identity of participants has been discussed through use of demographic data, such as nationality, age at immigration, generational age etc. However, a complex psychosocial adjustment such as 'cultural identity' would be better explored through questionnaires hinting at interpersonal adjustment, cultural values and social traditions (such as rituals, humour, social practices etc) (Hotvedt, 2013). This has been previously explored in some studies (Lou, Lalonde & Wong, 2015; Bejanyan, Marshall, Ferenczi, 2014; Hotvedt, 2013) who have built a literature about the cultural differences found in mate preferences, from a social and a personality psychology perspective. While extensive research has been found exploring cross-cultural variation and differences between cultures regarding specific mate characteristics, using a variety of methodological explorations, the progressive phenomenon of acculturation has not been explored, as of yet.

Acculturation has been defined as the process by which one is influenced by the host culture and one's own culture of membership (Berry, 2003). This phenomenon has often been measured by indicators such as cultural identification, pride, language preference and proficiency, or styles of communication (Zane & Mak, 2003). Living in a culture, that is not one's own, has serious influences on an individual's attitudes, beliefs and behaviours in intimate social relationships (Berscheid, 1995). People, as social creatures, are heavily influenced by their culture; and the process of choosing between one's own culture and host culture can often lead to acculturative stress and conflict, especially when the norms of these two cultures are contradictory (Giguere, Lalonde & Lou, 2010). This state of acculturative stress often catapults a process of considering the role of both cultures, towards one's own self-identity. An individual is

prone to questioning the relevance of the cultural attributes of their heritage in accordance with different parts of their self-identity (Berry, 2003). Keeping that in mind, it is possible to state that an individual's acculturation to their heritage or host culture, could be influential to their psychosocial adjustment to the current region of their residence (host culture). Nevertheless, this process remains masked in previous cross-cultural research exploring mate preferences, with several social and ecological influences of the environment being largely ignored (Pisanski & Feinberg, 2013).

Therefore, the current research aims to supplement the literature by providing an explorative look into the influence of acculturation, as judged by adjustment to heritage and host culture, on mate preferences.

REVIEW OF LITERATURE

According to Darwin's key theoretical concepts, the phenomenon of preferring one mating partner over several others, is of great importance to the transfer of genes in the history of humankind. It is the *inter-sexual competition* which drives sexual selection. A complementary process, *intra-sexual selection*, describes the competition between same-sex species members for access to other-sex mating partners.

Direct or indirect genetic benefits often drive inter-sexual selection to incur lower costs and higher benefits during the process of sexual selection, especially for females. Genetic benefits would include: 1) production of offspring with genotypes that promote high viability ('good genes' hypothesis) and, 2) production of offspring that are more attractive to others ('Fisherman' traits; Kirkpatrick & Ryan, 1991; Andersson, 1994; Jennions & Petrie, 1997). For such reasons, the study of mate preferences is a significant one (Buss et al., 1990).

The exploration of mate preferences has been traditionally conducted by investigating attractiveness judgements, with use of predetermined traits. Understanding attractiveness judgements is extremely important due to its salience in several decision-making processes in the social world. Perceived attractiveness has serious social consequences. Attractive individuals are more likely to go on more dates (Riggio & Woll, 1984), more likely to get hired (Chiu & Babcock, 2002; Marlowe, Schneider & Nelson, 1996) pay less bail (Downs & Lyons, 1991), and are perceived to live favourable lives (Little, Jones & DeBruine, 2011). After a careful look at the literature, certain facial traits have been closely associated with attractiveness judgements, these

include symmetry, facial health, averageness, facial masculinity or femininity (sexual dimorphism).

Mate Preferences:

Mating preferences have been previously defined by Heisler et al. (1987) as *'the sensory and behavioural properties that influence the propensity of individuals to mate with certain phenotypes.'* Essentially, these heritable mate preferences contribute to reproductive success. Cues such as secondary sexual characteristics e.g. breasts and buttocks (Cant, 1981) and cues of health and youth, have been selected over time (Singh, 1993) as contributory factors. A predominant variation found in mate preferences is driven by sex, with men preferring cues of youth and health and women preferring cues of resource acquisition and associated traits (Symons, 1979).

From an evolutionary perspective, the development of these sex-differences in mate preferences have been context-dependent, to guide mate selection and reproductive success (Buss & Barnes, 1986). Ancestral men were attracted to those women who could display observable cues of fertility, i.e. sexual maturity and youth. This was because women's fertility peaked in their mid-20's and declined sharply in their 30's (Rothman et al., 2013). Contrastingly, as men's fertility declined at a slower rate across their lifespan, there was less selection pressure for youthful features in long-term male partners for ancestral women.

On the other hand, ancestral women developed a preference for resource acquisition ability as men largely differed in their ability to provide resources. As humans employ an

expensive long-term mating strategy with a singular mate, the resource acquisition and parental investment abilities of the mate are direct benefits to be considered during mate selection. In recent times, a preference for high social status has also surfaced, with preference for older partners in women (Buss, 1989; Kenrick & Keefe, 1992).

Although the existence of such sex differences has been widely accepted in the field, some studies have not found replicable significant results. (Kurzban & Weeden, 2005; Eastwick and Finkel, 2008). In the context of mate selection, it is imperative to highlight that mate preference does not always translate to mate choice. It is mediated by the availability of partners (Perrett et al., 2002; Pollet & Nettle, 2009), attractiveness of an individual as a potential mate (Wincenciak et al., 2015; Little, Burt, Penton-Voak, Perrett, 2001), preference for short-term or long-term partners and several other environmental influences – such as state of attraction (Loewenstein, 2005) and environment harshness (Marcinkowska et al., 2014) etc.

Several research studies have also explored differential preference for face and body traits in potential partners. A few traits have been found to relate to attractiveness judgements, such as - symmetry, averageness, youth, sexual dimorphism, health, body size and adiposity (Pisanski & Feinberg, 2013). For the current research study, I will be discussing literature relevant to the traits of sexual dimorphism, symmetry, averageness and health.

Sexual Dimorphism:

Sexual dimorphism refers to the differences between secondary sexual characteristics between males and females. Cross-cultural research findings support evolutionary hypotheses,

that women prefer facial masculinity in male's faces, as a cue for health (e.g. Boothroyd, Scott, Gray, Coombes & Pound, 2013). While the association between facial sexual dimorphism and actual physical health is debatable (Rantala, et al., 2013), DeBruine and colleagues (2010) found a negative association between preference for facial masculinity and the health of a nation. A common association between preference for sexual dimorphism and affinity for healthy conditions, remains a consistent theory.

According to evolutionary theory, the preference for sexual dimorphism is driven by the 'good gene' hypothesis. That is, individuals prefer those mate characteristics in prospective mates which assure offspring health and reproductive success, especially in conditions of high environmental harshness. However, this theory is supported by contrasting and controversial results. While discussing the preference for facial sexual dimorphism, Bartres and Perrett (2014) found that people living in harsher environments with lower media exposure (e.g. without internet access) preferred more masculine women and more feminine men. While this could simply be an antagonistic result of constant exposure to social media, this finding was similar to a study by Little et al. (2007), highlighting the influence of environmental harshness on individuals' preference for facial sexual dimorphism. Little and colleagues (2007) found that environmental harshness was a better predictor of variance in sexual dimorphism preferences than relationship duration. In high environmental harshness conditions, they found high preference for less masculine men and less feminine women for long term relationships, as parental investment abilities are prioritised over high quality mates. For short term relationships, however, there was little difference between sexual dimorphism preferences regardless of environmental harshness. Marcinkowska et al (2014) showed similar results, while studying

men's preference for femininity in women's faces cross-culturally. In their sample, average femininity preference correlated positively with the health of the nation (explaining 50.4% of the variance), such that Nepal had the weakest femininity preference and Japan had the highest. In consideration of such literature, sexual dimorphism preference is found to be a complex mate characteristic that is driven by interactions between environmental harshness, health of a nation and relationship duration (Jones et al., 2018; Little & Jones, 2012; Little et al., 2002).

The mediating role of duration of relationship is extremely significant, as women have been found to strongly prefer resource acquisition cues, as a potential strategy to combat environmental harshness, in long-term context but not in the short-term context (Li & Kenrick, 2006). This, in accordance with the mating strategy commonly used by humans as a species, brings relevance to the importance of prioritising parental investment and resource acquisition abilities in long-term mating contexts.

The influence of external hormonal interventions, such as oral contraception, has also been found to mediate female's preference for sexual dimorphism in male faces (Little et al., 2001). However, recent research found that there was no compelling evidence to show that females' preference for facial masculinity could be tracked by changes in their hormonal status (Jones et al., 2018). Evidently, the predictive effect of hormonal changes on preference for facial masculinity, is an area of the literature that could be contributed to by future research.

Symmetry:

Mammals have a body plan of paired facial and body features, that are perfectly symmetrical. The existence of asymmetrical features is proposed to be due to genomic stress (such as, homozygosity of major genes and genomic mutations) or environmental stress (such as, malnutrition and pollution) or an interaction of both (Özener and Fink, 2010; Parsons, 1990, 1992). Therefore, such heritable resistance (Parsons, 1990) to genomic and environmental stress, are depicted by cues of symmetry and indicate developmental stability in an individual. In line with the 'good gene' hypothesis, women have evolved to prefer cues that indicate genetic fitness in their partner, such as facial symmetry and masculinity (Gangestad & Simpson, 2000; Gangestad & Thornhill, 1997).

Although methodological concerns were raised, previous research has found that experimentally manipulating facial symmetry (Perrett et al., 1999; Rhodes et al., 1998) and averageness in faces (Little, Hancock, 2002; Rhodes, Sumich, Byatt 1999; O'Toole, Price, Vetter, Bartlett, Blanz, 1999), affects perceived attractiveness of individuals independently. A preference for facial symmetry has strongly been documented across several cultures, especially within North America and Europe (Fink, Neave, Manning & Grammer, 2006). In Japan, undergraduate students showed a clear preference for symmetrical faces (Rhodes et al., 2001) and among rural agriculturalists in Belize, symmetrical men were documented as having more sex partners and more offspring, than men with facial asymmetry (Waynforth, 1998).

Much like any other mate characteristics, facial symmetry has been found to be dependent on the costs and benefits associated with it. Following the 'trade off' theory, Little et

al. (2007) found that facial symmetry was found less in areas with high disease prevalence and high preference for parental investment. In areas with high pathogen stress, the health of the offspring would be prioritized over desire for facial symmetry, to incur lower costs and higher genetic fitness benefits. Therefore, preference for facial symmetry were stronger among the Tanzanian Hadza, than UK residents (Little et al., 2007; Low, 1990).

Facial Averageness:

The averageness hypothesis of facial attractiveness has established a positive and linear relationship between composite averageness of faces and their perceived attractiveness (DeBruine, Jones, Unger, Little & Feinberg, 2007). This was first found by Langlois and Roggman (1990) when they averaged 16-25 faces of either sex, and found that the composite was deemed as more attractive than the individual faces themselves. Methodological concerns were raised about the fact that averaging faces naturally makes them more attractive, due to their symmetrical nature. However, evidence has been found to state that averageness and symmetry independently contribute to facial attractiveness (Rhodes, Sumich, & Byatt, 1999; Rhodes et al., 2001; Valentine, Darling & Donnelly, 2004).

The attractiveness of average faces could be due to perceptual bias of such faces appearing more prototypical (Winkielman, Halberstadt, Fazendeiro, & Catty, 2006) or due to averageness being a cue of health (Rhodes, Zebrowitz et al., 2001). Thornhill & Gangestad (1993) proposed the preference for average faces to be driven by an inclination towards heterozygosity in a population. Individuals with high facial averageness are representative of genotypes with a diverse set of genes in the population, thus equipping them with less common

proteins that pathogens have previously adapted to. Therefore, developing a preference for facial averageness would hold evolutionary benefits for an individual. Research supports this, by finding a positive association between MHC (major histocompatibility complex) genes and facial averageness (Lie, Rhodes, Simmons, 2008), and attractiveness (Roberts et al., 2005).

Rhodes et al. (2001) tested preference for facial averageness within UK and Hadza (of Northern Tanzania) populations. They found that both populations significantly preferred facial averageness within faces of their own culture. While Europeans preferred averageness in all faces, the Hadza only preferred facial averageness within their own culture, thus suggesting that such preference could be affected by exposure to unique individuals from various populations to create a population-specific concept of the 'average' face (Apicella, Little & Marlowe, 2007). Attractiveness judgements based on facial averageness have also been found within Japanese (Rhodes, Yoshikawa, et al., 2001) and African hunter-gatherer populations (Little, Apicella & Marlowe, 2007). The current study aims to explore influence of acculturation on preference for facial averageness, using similar methods to experimentally manipulate averageness.

Facial Health:

Preference for facial traits such as symmetry and sexual dimorphism, have been proposed to be related to preference for underlying health traits (Little, Jones & DeBruine, 2011). According to evolutionary theories, selecting and detecting healthy mates in one's environment would contribute towards both, direct and indirect, benefits to the individual. Therefore, the

preference of direct perceived health, also emerged as an important facial trait to be explored in the field.

Skin colouration, especially red colouration has been associated with cues of health and fecundity in organisms such as birds (Pryke & Griffith, 2006), fish (Millinski & Bakker, 1990), and non-human primates (Setchell & Wickings 2005; Waitt et al., 2003). For humans, red skin colouration has also been proposed to signal cues of health, and therefore attractiveness (Stephen, Smith, Stirrat & Perrett, 2009). Yellow skin colouration, due to dietary inclusion of carotenoids and vegetables, has also been correlated to attractiveness cues (Stephen et al., 2009). However, cues of health are not only restricted to skin colouration, but also, it's texture. In the current study, computer graphics manipulations similar to Little and colleagues (2011) were used to study preference for facial health characteristics in potential mates.

Cross cultural variation in mate preferences:

Mate preference across cultures, has also been explored by use of self-report measures such as Preferred mate characteristics (Buss et al., 1990) or dimensions of mate preferences such as warmth-trustworthiness, vitality-attractiveness and so on (Fletcher, Simpson, Thomas & Giles, 1999). The process of mate selection is not restricted to innate biological tendencies alone, it is also a social comparison process that individuals actively undertake. Common sex differences found in evolutionary research, such as men's preference for cues of youth and fertility and women's preference for resource acquisition cues, translate into relatable social norms that are better explored with a social psychology perspective. Such cross-cultural and temporal variation

has influenced several standards of beauty and historical changes in body modifications (Reischer & Koo, 2004). Such variations arise from differential morphing of mate preferences due to cultural and social norms that differ regionally. Therefore, evolution of variation in mate preferences had been contributed to by culturally different social learning strategies (Pisanski & Feinberg, 2013).

The first catalogue of mate characteristics was developed by Hill (1945), followed by the popularly used 'Preferred Mate Characteristics' list (Buss et al., 1990), and other list of characteristics (e.g. Furnham, 2009; Schwarz & Hassebrauck, 2012) have been used to judge cross-cultural variation in mate preferences. A review of overarching literature finds that extensive factor analysis into preferred mate characteristics listed across cultures, boils it down to a few dimensions. According to Goodwin and Tang (1991), 3 dimensions predominantly underlie mate characteristics and they are – kindness/consideration, extroversion and sensitivity. Simpson & Gangestad (1992) added 2 more dimensions (attractiveness/ social visibility, personal/ parenting qualities). Schwarz and Hassebrauck (2012) analysed over 82 characteristics to arrive as 12 dimensions – kind and understanding, dominant, pleasant, intellectual wealthy & generous, physical attractiveness, cultivated, humorous, sociable, creative & domestic, reliable and similarity. While such dimensions of mate characteristics have been created with a global use kept in mind, culture-specific scales have also been created. Atari and Jamali (2016), based on previous research, created a 26-item scale that ranged over the 5 dimensions (kindness/dependability, stats/resources, attractiveness/sexuality, religiosity/chastity and education/intelligence) to explore preference for culture-specific mate characteristics in Iranian men. Their results highlight the importance of exploring culture as an influential factor in mate

preference, by highlighting the preference for ‘religiosity/chastity’ and ‘wearing a hijab’ which is a culture-specific but relevant mate characteristic to be considered.

While cross-cultural mate preference research has developed scientifically enough to tease apart cultural influence, it has stayed clear of exploring the process of acculturation. Considering current times, it was determined that an explorative look on the influence of acculturation on mate preferences, to highlight bicultural influence, was imperative.

Acculturation:

The study of acculturation focusses on the broader process of an individuals’ attitudinal and behavioural adjustments to a culture in general. When a person moves from one culture to another, many aspects of their self-identity are modified to accommodate new information and experiences within the new culture (Ryder, Alden, Paulhus, 2000). As such, the process of acculturation is heavily influenced by the individual’s affinity to their heritage culture, and the readiness with which they accept or reject aspects of the host/new culture.

Two predominant theoretical models – unidimensional and bidimensional – are used to explain the relationship between the heritage culture and mainstream or host culture. Within the *unidimensional* model (Gordon, 1964), cultural identity is assumed to be on a single continuum over the course of time. Such that, the adoption of attitudes, values and behaviours of a new culture, naturally indicate the abandonment of heritage culture practices (Gans, 1979). A complex view of the model would highlight different aspects of cultural self-identity, moving across the acculturation continuum at different rates and ending at a complete dissipation of

heritage culture practices. Therefore, the complete adoption of host culture practices would indicate ‘assimilation’, which has been previously assumed as the end-point of acculturation. Demographic information such as age at immigration, years lived in the host country and generational status have been used as measures of acculturational status. While such markers do impart indication of cultural origin, they do little to highlight individual differences and external factors of influence such as pre-immigrational exposure to host culture or living within ethnically diverse neighbourhoods (Berry, 1980; Celano & Tyler, 1980). The psychosocial adjustment aspect of acculturation has been previously neglected.

To address this, the *bidimensional* model of acculturation was proposed. The major theoretical critique aimed at the unidimensional perspective, was its inability to envision an integration of heritage and host culture, or the emergence of biculturalism (Dion & Dion, 1996). Berry (1980, 1984, 1997) proposed the bidimensional perspective by highlighting the exercise of evaluation that individuals often undertake while actively interacting with two cultures. They evaluate and compare the values of either cultures, exploring if they still hold relevance and importance to the individuals themselves. Such an assumption allows for the heritage and host cultures to vary independently of each other and influence an individual’s self-identity independently (LaFromboise, Coleman & Gerton, 1993; Laroche, Kim, Hui & Joy, 1996).

Acculturation has been known to lead to cases of trauma and anxiety and general acculturative stress (Finch & Vega, 2003), when individuals come across contradicting values of heritage and host cultures. Researchers have found that retention of heritage culture practices and acquisition of new host culture practices are important resettlement factors that contribute to

psychological adjustment (Berry & Sam, 1997). Therefore, the influence of acculturation on social relationships must be considered from the lens of both, heritage and host cultures. As such, Edwards and colleagues (2008) found that language preferences, as an indicator of acculturation, had a significant effect on changes in sexual relationships in Latino/a adolescents. They found that adolescents who indicated Spanish as their preferred language, thus categorising them as unassimilated youths, had fewer sexual partners in their life time and higher rates of virginity at age 21, than adolescents who indicated English as their preferred language. However, the reliability of preferred language and traditional attitudes towards sexual activity as indicators of assimilation must be questioned, as it does not consider the bidimensional nature of cultural influence. While it is imperative to explore risk factors in sexual activities of youth, I believe that the role of acculturation has not been explored appropriately, without the use of an explicit measure that targets cultural adjustment. Edwards et al. (2008) hint at the role of values acculturation in their study, which has been expanded on by other researchers who explored the role of both, values and behavioural, acculturation. Values acculturation refers to the adoption of traditions and values of a 'dominant' culture, while the adoption of certain behaviours (e.g. preference for food and language) is referred to as behavioural acculturation (Sklar & Pak, 2016); both occur at different rates. It was found, in Sklar & Pak's (2016) study that behavioural and values acculturation differently influence racial preference during mate selection, thus having varying effect on an individual's preference for interracial marriage.

A large amount of literature has also explored the role of acculturation in mediating mate selection for long term relationships (i.e. marriage). An outdated belief on the influence of acculturation would have been to say that in the adoption of new cultural practices, an individual

abandons old heritage cultural practices and traditions. However, research has found that a bidimensional perspective on acculturation allows for the independent existence of heritage and host cultural identities in families and in individuals (Berry, 1997; LaFromboise et al., 1993). Interestingly, evidence suggests that children of immigrant families may be able to endorse both sets of cultural values and beliefs, as environmental cues only activate beliefs relevant to the cultural setting (Hong, Benet-Martinez, Chiu & Morris, 2003; Tsai, Ying & Lee, 2000). The gravity of such findings further enunciates the fact that culture as a psychosocial framework of adjustment is a far more delicate phenomenon than previously assumed.

Two theories, social exchange theory and assimilation theory, have risen to explain racial preference during mate selection. The social exchange theory (Blau, 1964; Kalmijn, 1993; Hwang, Saenz & Aguirre, 1995) states that individuals exchange socioeconomic status for racial status, thus preferring mates from the more dominant culture. This theory has been previously criticized for its incomprehensive and non-robust results (Sklar & Pak, 2016). The assimilation theory, in contrast, finds that individuals prefer mates from the dominant culture due to their own assimilation into the mainstream culture. Both theories do not consider the independent influence of heritage and host cultures, therefore failing to comment on their interactive relationships. Nevertheless, in an exploration of influence of behavioural and attitudinal acculturation and parent-child closeness on racial preference in mate selection, Sklar and Pak (2016) found interesting results. Parent-child closeness was found to significantly predict behavioural and attitudinal acculturation, which in turn had significant effects on racial preference in mate selection. Souza et al (2016) explored the difference in preferred mate characteristics in Brazil across three decades. While sex differences remained consistent, with men preferring observable

cues of fertility and women preferring resource acquisition cues, there was a slight reduction in the degree of preference. The preference for mate characteristics such as chastity and children also reduced, reflecting a sharp decline in what was previously called “traditional mate characteristics”. Taken in accordance with each other, both studies explore sub-cultural and cross-cultural differences in mate characteristics and the nature of mate selection. The relevance of looking at culture, from the progressive lens of acculturation, is imperative at this stage of mate preference research.

The Current Study:

The current study aims to explore the influence of acculturation, as a process of psychosocial adjustment to the host culture (UK), on potential mate preferences. A large part of the literature in the field of mate preferences, fails to acknowledge the importance of considering acculturation as progressive phenomenon, that varies across time. That is, an individual can gradually adopt the values, beliefs and cultural traditions of the new culture, with/without abandoning heritage cultural traditions (Afafe-Munsuz & Brindis, 2006).

Conversely, it is a gradual change wherein individuals, spanning generations, adjust to their new culture by embracing norms and values of both, their heritage and their host cultures (LaFromboise et al., 1993; Berry 1997). Therefore, the current study is based on a plethora of previous research in the fields of acculturation and face research, respectively.

The study design that has been used to investigate mating preferences, by exploring preference for certain facial characteristics (namely: symmetry, health, averageness and sexual dimorphism) has been previously used in several studies (Jones et al., 2018; Marcinkowska et al.,

2014; Wincenciak et al., 2015; Penton-Voak & Perrett, 2000; Penton-Voak et al., 1999).

Contrastingly, mate preferences have also been explored via self-report techniques such as the Preferred Mate attributes scale (Bejanyan et al., 2014; Buss et al., 1990) or the list of 26 mate characteristics developed by Fletcher and colleagues (Hynie, Lalonde & Lee, 2006; Fletcher et al., 1999). In order to investigate subtle and unconscious preferences of mate characteristics, the current study explored preference for facial traits through forced choice experiment with manipulated faces.

The exploration of cross cultural variation in mate characteristics began with the study conducted by Buss et al. (1990), which paved the way for similar studies (Hatfield and Sprecher, 1995). While Buss and colleagues explored cultural similarities and differences for mate preferences across 37 countries, they had no explicit measure of cultural element which moderated difference in their study. Several studies, exploring cross-cultural variation, have used self-reported demographic information such as country of residence (Marcinkowska et al., 2014; Bartres & Perrett, 2014) and national health index (DeBruine et al., 2010), to explore mate preference differences between vibrant cultural communities. While they have succinctly enriched the vast literature, the field would benefit from an exploration of the effects of acculturation on mating strategies (Bejanyan et al., 2014). In the realm of the current study, the process of acculturation towards the mainstream culture of UK was explored. Since acculturation has been defined as the process through which an individual identifies with both, their host and heritage culture (Berry, 2003), the current study aimed to conduct an explorative investigation on its effects on mating preferences.

The current study aimed to explore four hypotheses. Since both, heritage and host cultures have been known to independently influence an individual's cultural identity, the study aimed to explore the influence of acculturation towards host and heritage culture on preference for 4 facial traits. The study also aims to explore sex differences found within preference for facial traits, as influenced by acculturation. The study also aims to explore the influence of language preference, as an indicator of cultural identity, on preference for all facial traits.

METHODOLOGY

Participants:

Sixty-five participants took part in the study, including females ($n = 40$), males ($n = 25$) and others ($n = 2$). The age of the sample ranged from 18 to 48 years, with a mean of 26.62 years ($SD = 6.33$). The mean age for female participants was 24.77 years ($SD = 4.79$) and for male participants was 29.2 years ($SD = 7.58$). 30 participants in total reported their heritage from European countries (e.g. Ireland, Hungary, Sweden and so on), 3 from Oceania countries (e.g. Australia), 2 from African countries (e.g. Madagascar, Turkey etc), 21 from Asian countries (e.g. China, India, Pakistan and so on) and 6 from North American countries (e.g. United states and Canada). Out of which, 26 reported to be monolinguals and 41 reported to be bilinguals. All participants reported to be current residents of the United Kingdom.

Participants were recruited through social media channels of the primary researchers, followed by snowball sampling methods. All participants were provided with an information sheet, describing the purpose and details of the current study, followed by an online consent form. Participants were informed beforehand that they were required to be 18years of age or above, and current residents of the UK, to take part in the study.

Data from 2 participants were removed for the final analysis, as participants took exceptionally long/short to complete the study. Thus, it was determined that the data would not be reliable.

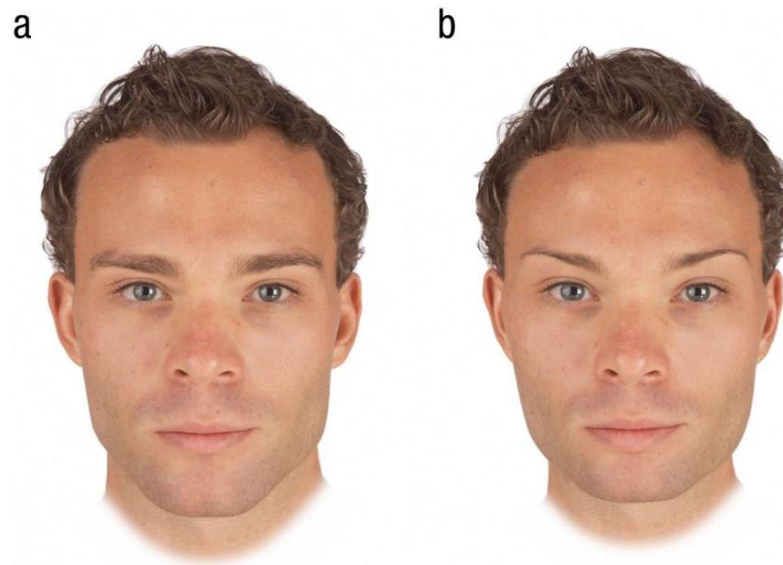
Stimuli:

The stimuli used in the experiment were obtained from a freely available database (Jones et al., 2018) hosted on OSF (<https://osf.io/9b4y7/>). Ten male and ten female faces were selected and modified to contain high and low level of select traits (sexual dimorphism, health, symmetry, averageness). The stimuli were manufactured using standard procedures described in previous research (Jones, et al. 2018; Little et al., 2010; Wincenciak et al., 2015) using Psychomorph (Tiddeman, Burt & Perrett, 2001).

1. Sexual dimorphism manipulations:

The prototypes were created by averaging faces of 50 white women and men from the 3DSK database (<https://www.3d.sk>). Next, a random selection of 10 male and 10 female faces from the same database was made. Then, a feminized and masculinized version of each of these 10 images was created by adding or subtracting 50% of the linear difference between symmetrized versions of the prototype faces. This process created 20 pairs of face images in total, with each pair consisting of a feminized and masculinized version of one individual face image. An example of the stimuli, differing in sexual dimorphism (masculine vs feminine) face trait has been shown in Fig 1. Similar stimuli have been used in the past to explore women's preference for facial masculinity (Jones et al., 2018; Little & Jones, 2012) and to predict actual partner choices (DeBruine et al., 2006).

Fig 1. Examples of (a) masculinized and (b) feminized versions of faces (Jones et al., 2018).



2. Health Manipulations:

To manufacture faces varying in apparent health, first the healthy and unhealthy prototypes were created by averaging 15 most healthy-looking and 15 least-healthy looking faces from the 3DSK database (for details of the ratings of faces and steps taken to manufacture the stimuli, please refer to Wincenciak et al., 2015). Stimuli for the experiment were created by taking 10 male and 10 female faces and creating two versions, one with increased and one with decrease apparent health. These versions were created by adding 50% of linear differences in colour and texture cues between the healthy and unhealthy prototype, for each of the individual faces, moving along the axis towards the healthy and unhealthy prototype retrospectively. This process yielded 20 pairs of faces, with each pair containing a healthy and unhealthy version of the same face. It has been established in previous research that this method reliably alters health perceptions

in facial cues (Jones et al., 2005).

3. **Symmetry Manipulations:**

Twenty pairs of faces (10 male faces and 10 female faces) were used to assess the preference for facial symmetry. Each pair contained an original image, and a symmetrised version of the image. Following Perrett et al. (1999) and Watkins et al. (2012), symmetrised versions were created by adding 50% shape difference between the original image and the perfectly symmetrical version of the original image.

4. **Averageness Manipulations:**

To manufacture twenty pairs of faces, to explore preference for facial averageness, 10 individual images from each age and sex group were chosen from the database. We calculated the linear differences in 2D shape between 10 individual male and female images and the average shape for the prototype faces (as described in the sexual dimorphism manipulations). Final pairs of images were constructed by adding 25% of these linear differences to the 10 individual images (male and female, each) to make more average versions of each original face. This process yielded 20 pairs of images, with one version being 25% more average than the original image. Similar procedure has previously been used in studies to investigate preference for facial symmetry and averageness (Saxton et al., 2011; Jones, DeBruine and Little, 2007)

Measures:**Adapted Vancouver Index of Acculturation (VIA)**

An adapted version of the Vancouver Index of Acculturation (VIA) (Paulhus, 2013) was used to investigate participants' acculturation towards their own heritage culture and/or their acculturation towards the host culture (UK). Since the study only aimed to explore acculturation towards British culture, any questions regarding North American culture were adapted to suit the sample. In accordance with Berry's framework (Berry, 1980; Celano & Tyler, 1990) the VIA measures heritage culture and mainstream/host culture as influential factors that vary independently of each other. The 20 items explore both, emotional and interpersonal adjustment towards heritage (e.g. I often participate in my heritage culture traditions.) and host cultures (e.g. I often participate in mainstream British culture traditions). The items are presented correspondingly, with one question referring to heritage culture (e.g. I am comfortable interacting with people from the same heritage culture as myself.) and the other referring to the host culture (e.g. I am comfortable interacting with typical British people.). Participants were asked to respond on a 9-point Likert scale ranging from 'Strongly Disagree' to 'Strongly Agree'. The heritage dimension of the original scale was validated across Chinese, East-Asian and Miscellaneous (populations other than of Chinese or East-Asian descent) samples and yielded highly reliable ($\alpha = .91, .92$ and $.91$ respectively) results. Similarly, the host culture dimension was also found to be internally consistent ($\alpha = .89, .85$ and $.87$ respectively) with the same samples. The instrument was expressly chosen for its ability to inspect interpersonal and psychosocial components of adjustment to a new culture.

Attractiveness Rating Experiment

In each test session, participants were shown 80 pairs of faces that differed on facial traits of symmetry, health, sexual dimorphism and averageness. The trial order in which these pairs were shown, was random in each test session. Participants were instructed to select the face that they found more attractive, with possible answers ranging from “slightly more attractive”, “somewhat more attractive”, “more attractive” and “much more attractive”. This method has previously been used to test facial masculinity preferences (Zietsch, Lee, Sherlock & Jern, 2015; Jones et al., 2018).

Demographic Information

Participants also provided demographic information such as, age, gender, nationality and language preference (bilingual or monolingual).

Design:

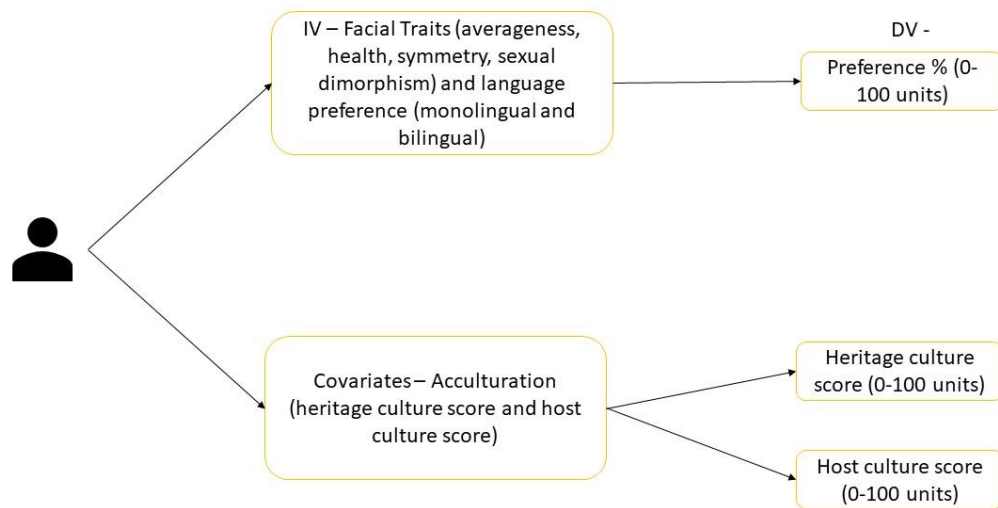
A within-participants design was used to explore the influence of acculturation to heritage and host cultures, as covariates, on preference for 4 facial traits – symmetry, health, averageness and sexual dimorphism.

Appropriate and previously validated measures were used to explore the main constructs of the experiment accurately. Acculturation was investigated with use of an adapted version of Vancouver Index of Acculturation (VIA) which resulted in two dimensions – heritage scores and host culture scores. Heritage culture scores were computed by adding scores for odd numbered

items of the original instrument (e.g. items 1, 3, 5...) and Host culture scores were computed by doing the same with scores of even numbered items from the original instrument. Faces were manipulated with use of computer graphics, to measure preference for facial traits of symmetry, health, averageness and sexual dimorphism. This method has been previously used in similar research (Zietsch et al., 2015; Jones et al., 2018).

The independent variables considered in the current study were - the face traits that the faces were manipulated for, and language preference (monolingual or bilingual). The dependent variable was preference measured for each face trait. Acculturation towards heritage and host cultures, as measured by heritage and host scores on the VIA, were treated as covariates.

Fig 2. Design of Study.



Procedure:

The study was conducted online on a secure server (<http://faceresearch.org>). In each test session, participants were first informed about the purpose of the study and provided information regarding the procedure of the experiment and contact details of researchers. Next, demographic information was collected from the participants. Participants were required to respond to questions on the adapted Vancouver Index of Acculturation scale, before beginning the attractiveness rating experiment.

In the attractiveness rating experiment, participants were shown 80 pairs of faces that differed on facial traits of symmetry, health, sexual dimorphism and averageness. The trial order in which these pairs were shown, was random in each test session. Participants were instructed to select the face that they found more attractive, with possible answers ranging from “*slightly more attractive*”, “*somewhat more attractive*”, “*more attractive*” and “*much more attractive*”. This method has previously been used to test preferences for multiple facial traits (Zietsch et al., 2015; Jones et al., 2018; Wincenciak et al., 2015).

On completion of the experiment, the participants were debriefed shortly. They were thanked for their time and informed that subtle manipulations were made to the faces that they had just seen, and that their attractiveness rating would be discussed in the research study, in relation to their acculturation to UK culture.

Ethical Considerations

The present study has been approved by the Ethics committee at the University of Glasgow. Measures were taken to safeguard the participants, by conducting the experiment on a secure online server hosted by the University of Glasgow (faceresearch.org). Participants were informed about the nature and purpose of study and all information collected was voluntary and consented (refer to Appendix for participant information sheet and consent forms), prior to beginning the experiment. Participants were required to be above 18 years of age, and current residents of the UK, to take part in the study. No identifying information was collected from the participants, to protect their identity. All measures used in the experiment have been previously validated. Participants were also provided with contact details of the ethics committee and the primary researcher, to enable contact in case of query or discomfort.

Data Analysis

The present research study hypothesized the following:

1. The degree of acculturation to heritage and host cultures would differentially influence preference for face traits.
2. Sex differences in preference for facial traits would exist between males and females, based on previous findings.
3. Language preference would influence preference for all facial traits, between men and women.
4. Sex differences would also exist on the influence of acculturation, as determined by heritage and host culture scores, on preference for various facial traits.

To address the above, a within-participants design ANCOVA was conducted to explore the role of acculturation (as determined by heritage and host culture scores) as a covariate. The four facial traits namely, symmetry, health, averageness and sexual dimorphism, remained as the

independent variable, along with language preference, and preference for these facial traits, was determined to be the predictor variable. All statistical analysis was conducted with use of R.

Since mate preferences vary by sex, the original sample was divided into females and males for further data analysis. The heritage culture scores were determined by adding up scores of odd numbered items on the VIA, and the host culture scores were determined by doing the same to even numbered items of the VIA. Preference for each facial trait was calculated by averaging scores for faces manipulated for each trait.

Normality checks, assumption checks and independence of the covariates from the independent variable were all checked as part of preliminary analyses, before the ANCOVA model. Results of preliminary analyses are reported in the following section.

RESULTS

Preliminary analyses:

The original sample was filtered by sex, to create two sample sets – one for female participants and one for male participants. Since mate preferences significantly vary by sex, the sample was filtered by sex.

Levene's test was conducted to check homogeneity of variance between groups of the independent variable (face traits) in both females and males. The test reported heterogeneous variance, thus requiring a careful consideration of further ANCOVA results.

Several ANOVAs were conducted to check the independence of the covariates (heritage culture score and host culture score) from facial traits and language preference (independent variables). Heritage culture scores were found to vary independently from face traits in females ($F = 0.01, p = 1$) and in males ($F = 0.06, p = 0.98$). Host culture scores were also found to vary independently from face traits in females ($F = 0.008, p = 0.99$) and in males ($F = 0.05, p = 0.98$). Heritage culture scores were found to vary independently from language preference in females ($F = 1.68, p = 0.1$) and in males ($F = 3.17, p = .07$). Host culture scores were found to vary independently from language preference in males ($F = 1.06, p = .3$) but not in females ($F = 7.34, p < .05$). The assumption to establish independence of variance explained by independent variables and covariates in a model is to refine experimental error estimates, and to accommodate for treatment effects that arise from differences within the treatment groups (Geoffrey, 1991). In the current design, language preference is treated as a categorical predictor

variable that is an observed result of the current sample group, and not a direct result of experimental manipulation. Since the independence assumption of the categorical predictor variable and covariate (host culture scores) is irrelevant to the design of the experiment (Grace-Martin, n.a), I have assumed that the necessary assumptions for the ANCOVA model have been met.

Since two covariates – heritage and host culture scores, were estimated using the same instrument (VIA), a correlation was run between the two. A significant positive correlation was found between heritage culture and host culture scores in females, $r(157) = 0.36, p < .05$, and in males, $r(97) = 0.45, p < .05$. Since all correlations were found to be small (r s below 0.5), the assumption for ANCOVA was considered to be met.

In the current sample, all participants reported similar preference for all traits. However, female participants showed higher preference for facial symmetry, facial health and averageness. While male participants showed a higher preference for sexual dimorphism in face (femininity) on average. Females, on average, also scored higher on both heritage and host culture acculturation. Descriptive statistics for participant demographics information, preference for facial traits and acculturation scores, by sex, have been presented in Table 1.

Table 1

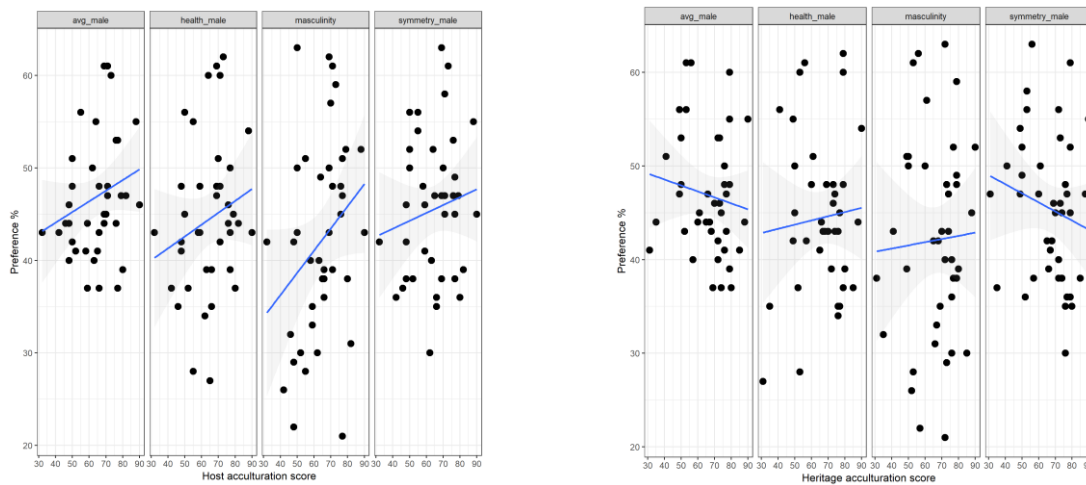
Descriptive statistics of preference for participant demographics, facial traits and acculturation by sex.

		Males M (SD)	Females M (SD)
Participant Demographics	Age	29.72 (7.58)	24.77 (4.79)
	N	25	40
Facial Traits	Averageness	42.6 (5.89)	46.9 (6.57)
	Symmetry	40.8 (6.89)	45.5 (7.92)
	Health	43.5 (5.94)	44.5 (8.55)
	Sexual Dimorphism (femininity and masculinity)	42.6 (7.31)	42.1 (10.8)
Acculturation	Heritage culture scores	64.72 (16.29)	66.29 (14.11)
	Host culture scores	62.93 (18.05)	64.31 (13.06)

Effect of Acculturation and Language Preferences

The current study hypothesized the following: 1) The degree of acculturation to heritage and host cultures would differentially influence preference for face traits, and 3) Language preference would influence preference for all facial traits, between men and women. A mixed ANCOVA was conducted to explore the influence of heritage culture scores, host culture scores (as covariates) and language preference (as an independent variable) on preference for all facial traits, in men and in women.

Fig 3. Relationship between (a) host culture scores and (b) heritage culture scores and preference for all facial traits in females.



Females: The acculturation towards host culture was significantly related to women's preference for all facial traits, $F(1,152) = 6.37, p = 0.01, r = 0.14$. Acculturation towards host culture was found to have a small, yet positive, correlation with preference for all facial traits, as shown in Fig.3 (a).

Acculturation towards heritage culture, was found to be non-significant in its relationship with preference for facial traits, $F(1,152) = 1.27, p = 0.2, r = -0.05$. However, it was negatively correlated to preference for averageness and symmetry in male faces, and positively correlated to preference for health and masculinity in male faces, as shown in Fig 3 (b). With a non-significant effect, the effect of heritage culture acculturation on females' mate preferences should be carefully considered.

There was also a significant effect of language preference on facial trait preference in women, $F(1,152) = 4.16, p < .05, r = -3.05$. During Tukey post hoc tests, language preference was found to be significantly negatively related to preference such that, bilingualism predicted 3.05 times lesser preference for all facial traits in women. The implications of language preference, as a behavioural indicator of acculturation, will be discussed later.

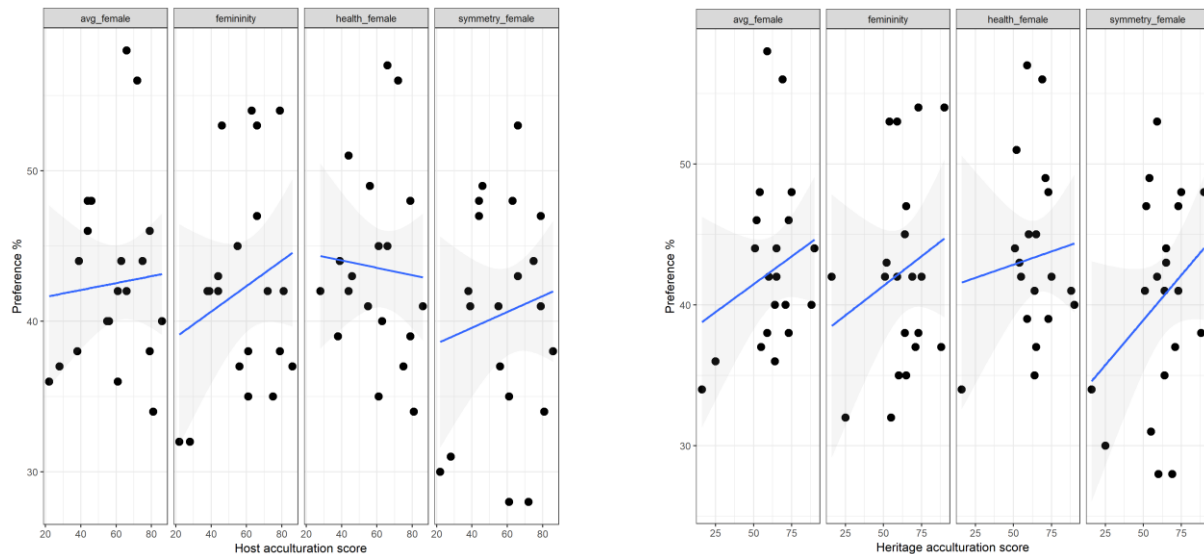
There was also a slightly significant main effect of facial trait manipulation, on preference, $F(3,152) = 2.39, p = 0.07, \eta_p^2 = 0.35$. Therefore, the main effect of facial trait manipulation on preference in women, was a considerably large effect. This indicates that females varied greatly in their preference for all facial traits. Tukey post hoc tests revealed that

females of the current sample showed greater preference for masculinity manipulations, than averageness in male faces (difference = 4.8, $t = 2.58$, $p = 0.05$). There was no significant difference among preference for facial health, facial symmetry and averageness. However, the covariates (heritage culture and host culture) differently affected preference for these facial trait manipulations, as seen in Fig. 3.

Males: There was a significant effect of acculturation towards heritage culture on preference for all facial traits in men, $F(1,92) = 4.23$, $p < .05$, $r = 0.09$. The relationship between heritage culture scores and preference for facial traits was found to be positive (see Fig 3.b), such that increase in heritage acculturation by 1 unit would result in increase in preference by 0.09 times.

The effect of acculturation towards host culture, $F(1,92) = 0.01$, $p = 0.8$, $r = -0.005$, and language preference, $F(1,92) = 1.13$, $p = 0.2$, $r = 1.4$, had non-significant effects on the preference for all facial traits in men. However, host culture scores were positively correlated to preference for averageness, femininity and symmetry manipulations in female faces, and negatively correlated to health manipulations (see Fig 3.a). There was no significant main effect of facial trait manipulation, $F(3,92) = 0.71$, $p = .54$, found on preference, in men. Therefore, no post hoc tests were conducted. However, the effect size of the model, considering effect of covariates on preference for all facial traits in men, was $\eta_p^2 = 0.07$.

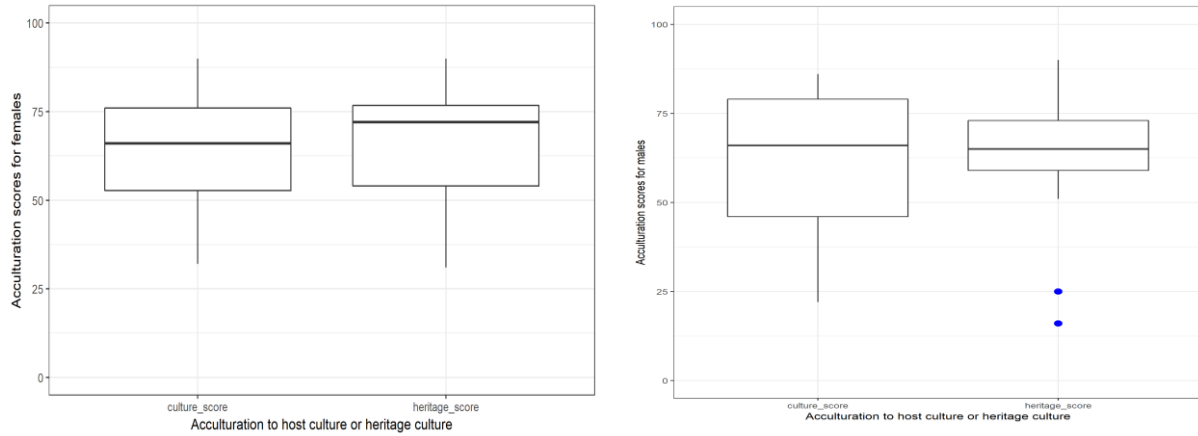
Fig. 4. Relationship between (a) host culture scores and (b) heritage culture scores and preference for all facial traits in males.



Sex differences within preference and acculturation

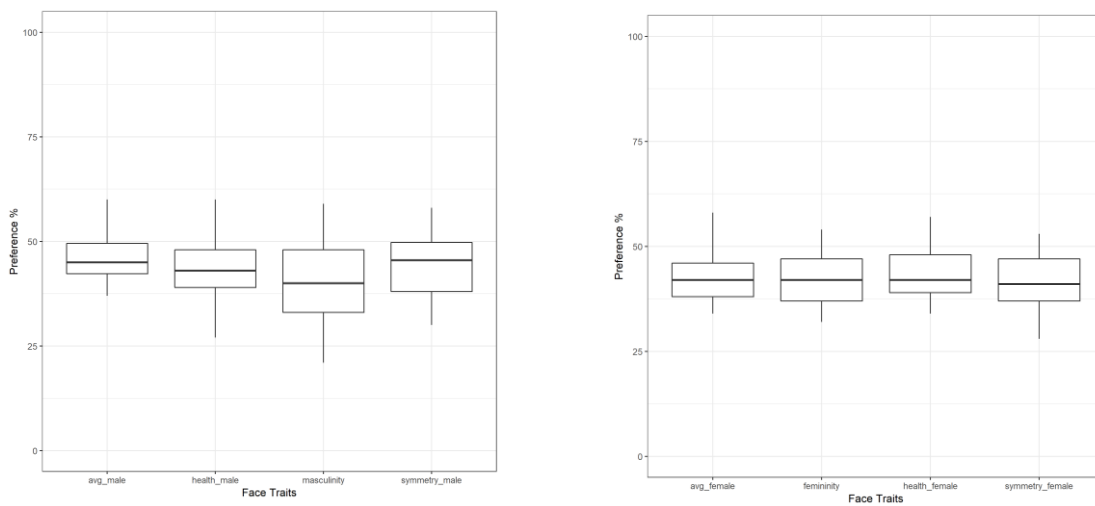
The previous ANCOVA model established that facial trait manipulations explained significant variance in preference for females, but not for males. Therefore, effect size differences were calculated to explore how facial trait manipulations affected preference for females and males. The difference between group means indicate weak sex differences in preference for various facial traits, in the present sample (see Table 1). However, there was a significant sex difference between preference for symmetry ($d = 0.62, r = 0.29, p < .05$) and averageness ($d = 0.68, r = 0.31, p < .05$) manipulations, with females preferring such manipulations more than males. The difference has been visualized in Fig. 5.

Fig. 5. Spread of preference scores for all facial traits in (a) females and in (b) males.



However, sex difference in scores for acculturation towards heritage culture ($d = 0.1, r = 0.05, p = .68$) and host culture ($d = 0.09, r = 0.04, p = .73$) were non-significant (see Table 2). The effect size of the difference was also very small (with d 's equal to or < 0.1). The sex differences in heritage and host culture scores has been visualized in Fig. 6.

Fig. 6. Spread of acculturation scores to host and heritage cultures in (a) females and (b) males.



DISCUSSION

Collectively, the results of the current study indicate that acculturation independently and differently influences preference for facial traits in females and in males. In Females, host culture acculturation was found to be significantly and positively influential. In males, acculturation towards heritage culture was a significant influencer on preference for various facial traits. Language preference, as a behavioural indicator of acculturation, was also significant in influencing preference, but only for females.

Significant sex differences were found in the preference for symmetry and averageness manipulations in faces, with females preferring such facial traits far more than males. However, significant sex differences within acculturation towards heritage or host culture were not found within the sample. It is imperative to notice that sex differences found in mate preferences are moderated by several factors that were not directly considered within the design of the study, such as relationship duration (Little 2014; Li & Kenrick, 2006) and hormonal influences (Jones et al., 2018). Thus, the current study only provides preliminary evidence to explore and investigate the interim role of acculturation as a process, on preference for facial features in prospective mates.

There is a large set of research that explores the role of culture on mate preferences. Such literature ranges from the exploration of cross-cultural variation in preferred mate characteristics (Gangestad, Haselton & Buss, 2006; Gangestad & Buss, 1993; Buss et al., 1990), understanding temporal variations in mate preferences in Brazilian samples (Souza et al., 2016), documenting

culture-specific and universal mate preferences (Atari)2017), to exploring the influence of acculturation on inter-racial marriages (Lou, Lalonde & Wong, 2015; Hynie et al., 2006; Lalonde et al., 2004). In this vast field that explores the interactive role of cultural and social standards, this study is the first to specifically investigate the effect of acculturation towards heritage and host (UK) culture on mate preferences.

Within the realm of evolutionary psychology, the part played by culture can be through: transmission and/or evocation of practices to contribute towards long-term mechanisms that enable selection and reproduction (Gangestad et al., 2006; Tooby & Cosmides, 1992). Acculturation, as an integrative state of heritage and host cultures, provides a juxtaposition of both functions of culture to an individual. The results of the current study found that mate preferences in females were significantly influenced by acculturation towards host culture, as compared to their heritage culture. A supposed reasoning for such a relationship could lie within gender-based differences in the ability to engage with the social norms of the host culture. Rumbaut (1991), Chung (2001) and Sklar & Pak (2016) found that Asian American females reported higher parental conflict about dating than Asian American males. Following which, Chung (2001) suggested that the preference for interracial marriages within Asian American females could be due to tendencies to defy traditional patriarchal norms. However, such findings have not been replicated within the British cultural arena. Incidentally, Buss et al (1990) found that cultural effects dominated gender effects within mate characteristics such as ‘chastity’ and ‘good housewife’ attributes, which were endorsed under the umbrella of traditional mate characteristics. Similar findings, surrounding the preferred mate characteristics in women (such

as ‘wearing a hijab’) have also been reported as culture-specific mate characteristics by Atari (2017).

Considering that strict social standards regarding personal empowerment and gender equality weigh heavily on women, the influence of acculturation towards UK culture being a significant predictor of variance in mate preferences is an interesting avenue for future research. A possible paradigm to understand tendencies of females and males to acculture differently to UK culture, would be to consider the gender inequality in their heritage and their host (UK) cultures. According to the Gender Inequality Index (Human Development Records, 2015), UK has a gender inequality score of 0.11 (on a scale of 0-1), while most countries in Asia, Africa and Oceania range from 0.12 – 0.54.

Language preference, as an indicator of behavioural acculturation, was also found to significantly influence mate preferences in females. Edwards et al. (2008) found language preference to be a significant predictor of sexual activity in Latino/a adolescents. They found that unassimilated adolescents (with higher heritage culture acculturation than host culture) were likely to have fewer sexual partners in their lifetime, thus reducing their chances of unsafe sexual activity. Their research highlighted the role that acculturation played in influencing sexual activity in a Latina sample. It is imperative to note that their results pertaining to acculturation were based on language preferred at the time of interview, unlike the use of a direct measure of acculturation in the current study. Taken in consideration with the results of the present study, acculturation can be presented as a notable cultural phenomenon to explore further, in a mediating context of social relationships.

Variance in mate preferences in males, in the current sample, were significantly influenced by heritage culture as compared to the host culture of UK. They were also found to prefer higher sexual dimorphism cues in female faces, than females preferred in male faces. One explanation of such a relationship, could be highlighted by gender inequality circumstances in a comparison of males' heritage and host cultures. Further research is needed to understand the interaction between heritage culture acculturation and mate preferences in multicultural males, to better understand which mate characteristics they prioritize and how this is influenced by their heritage culture. Using the narrative of evolutionary psychology, the preference for sexual dimorphism cues could also be driven by lower environmental harshness and prioritisation of quality of mates over parental investment. However, since the design could not accommodate variables directly referring to relationship duration, prioritisation of mate characteristics such as 'desire for children' and environmental health, such results can only be considered as preliminary.

With use of a direct measure targeting acculturation (VIA), the present study could successfully identify the role of acculturation as an indicator of psychosocial adjustment, in variance in mate preferences. In accordance to the rationale of the study, it provides preliminary evidence to further consider the complex and interactive role of acculturation within the vast literature on mate preferences. Although the small sample size of the study restricts it from finding large generalizable results, it was able to accurately identify the effect of acculturation within such a small sample size. Nevertheless, such preliminary evidence cannot be generalized to a larger sample, without careful consideration of the results.

Acculturation as a process, involves the absorption of cultural values and norms of the host culture, independently of the cultural attributes of the heritage culture. A major debate in

field of acculturation studies, has been the consideration of interdependence vs independence factors within heritage culture. The existence of acculturative stress (Giguere et al., 2010) arises due to the conflict that exists between the cultural values, norms and traditions of one's heritage and host cultures. Consequently, children from highly interdependent (collectivist) cultures are conflicted between their desire to fulfil familial expectations and upkeep familial honour and the desire to exercise the individualism and independence advocated by the new host culture (Dion & Dion, 1996). Such areas of conflict were not explored within the current study and would act as beneficial additions to future avenues of research.

A consideration of results from the current study, in tandem with the gender inequality index and Preferred Mate characteristics (Buss et al., 1990) would also provide an in-depth, and social psychology oriented investigation of changing mate preferences in future research. With the establishment of acculturation as an important phenomenon to consider within mate preferences, a qualitative exploration of preferred mate characteristics in multicultural people within the setting of their host culture (see: Atari & Jamali, 2016; Atari, 2017) would also be a beneficial addition to the field.

This study presents interesting findings to spark the start of conversation surrounding the role of acculturation as a progressive phenomenon that influences multicultural individuals living within the same country. As such, it acts as a significant addition to the vast mate preference literature.

CONCLUSION

Culture is an integral part of an individual's psychosocial adjustment. As such, it holds a strong influence over one's social relationships, including the decisions that help us choose prospective mates. Therefore, a consideration of acculturation to a new culture, in juxtaposition to one's heritage culture, adds considerable knowledge to the growing field of mate preferences. The present study established that acculturation, towards host (UK) and heritage cultures, independently influences mate preferences in females and in males. In females, host culture was found to significantly influence mate preferences. While heritage culture acculturation was significant in influencing males' mate preferences. Such findings provide preliminary evidence on the influence of acculturation as a culture factor in mate preference research. However, the results cannot be generalized without careful consideration. Recommendations for future research highlight the consideration of social factors such as gender inequality within cultures, and a qualitative exploration of sex differences within heritage and host acculturation. Going forward, future research needs to consider the interactive role of acculturation as a progressive phenomenon on various mate preferences, to discover the multifaceted role that culture plays in this domain.

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Please find below the list of permissions that you **MUST** obtain and submit to the Ethics Administrator before commencing with data collection. You can either provide a scanned copy of the permission letters to: education-ethics@glasgow.ac.uk, or send a hard copy to: C. Paterson PGT Office St Andrew's Building 11 Eldon Street Glasgow G3 6NH

Permission required from:

n/a

Office:

Received in Admin

Recommendations (where Changes are Required)

- **Where changes are required all applicants must respond** in the relevant boxes to the recommendations of the Committee and return to the Ethics Office to explain the changes you have made to the application.
- **(If application is Rejected a full new application must be submitted by returning to the Ethics Office. Where recommendations are provided, they should be responded to and this document provided as part of the new application.**

(Shaded areas will expand as text is added)

MAJOR RECOMMENDATION OF THE COMMITTEE APPLICANT RESPONSE TO MAJOR RECOMMENDATIONS

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MINOR RECOMMENDATION OF THE COMMITTEE APPLICANT RESPONSE TO MINOR RECOMMENDATIONS

<p>Section 7.2</p> <p><i>Since the questionnaire will be conducted online, it will be accessible to any individual with a computer and access to the internet.</i></p> <p>That is a problematic recruitment strategy – and contradicts information about over 18s and UK based</p> <p>Related are ISP details collected by the website?</p>	<p>In order to participate in the study participant will need to be at least 18 years of age and be currently living in the UK. This requirement is provided in the PLS and participants will be asked to check the box at the beginning of the survey to confirming their age. Although the study will be hosted online (on the UoG server), the link to the study will be supplied to targeted population (e.g. UoG students).</p> <p>Although the website will have information about the respondent IP address, this will be hosted on the UoG server and the researcher will not be able to access any information about the respondents IP address. The weblink to the study will be supplied to the admin when available.</p> <p>Statement ‘no personal data will be collected’ was added to the box.</p>
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<p>Please supply web details (URL) once known to admin to add to file</p> <p>Section 10 – Should perhaps note in box ‘no personal data will be collected’</p> <p>13.1 <u>Since the experiment is open to participation from adults of any ethnicity or <i>residency</i>, - but already stated limited to UK residents – please clarify</u></p> <p><u>The study will also be advertised on the researchers’ personal social media (such as Facebook, Twitter and Reddit), with a link to the online experiment.</u></p> <p>Please justify this untargeted recruitment strategy? (relate to comment about 7.2)</p> <p>PLS</p> <p>currently <u>live</u> in the UK – ‘live’</p> <p><u>What will happen if I take part –</u> includes country of residence as does next</p>	<p>Information about the requirement of participation in the study (UK residence and age – point 4, section 13.1) have been reiterated in the PLS. Participants will indicate that they are aware of these requirements by checking appropriate boxes on the form before continuing with the study.</p> <p>The researcher is a student of UoG, living in the UK with friends who are adults working or studying in the UK. Advertising the study for this population through personal social media increases the chances for recruiting the required number of participants, The participation requirement will be made clear in the advert.</p> <p>PLS: The required information has now been added and the errors have been corrected: <i>Why have I been chosen?</i> You have been chosen because you are 18 years old or older, currently living in the UK and have responded to the information regarding the experiment (in the form of email or social media posts). This research aims to recruit about 200 participants. While the experiment is open to participants from various nationalities and ethnicities, it will only be considering those who are currently living in the UK.</p> <p><i>Will my taking part in this study be kept confidential?</i> Since the experiment will be conducted online, no identifying or personal information will be collected from the participants. You will not be mentioned by any identifying information, such as name, in the research. For the sake of this research study, your nationality and country of residence will be discussed as influential factors in the research. Since the experiment will be conducted online, you will be able to maintain complete anonymity. Any information collected from you will be completely anonymised.</p> <p>Consent form: A check box confirming the UK residency has been added.</p> <p>Appendix: Question about the country of residence has been removed as participant</p>
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<p>section – and perhaps clarify that <u>no</u> personal information is collected plus next section if no personal data collected than it is already anonymised</p> <p>Consent form</p> <p>Should it not also ask to confirm resident in UK?</p> <p>Appendix 1.3 - Country of current residence problematic since you have stipulated only UK residents – please clarify –</p>	<p>will need to check the box confirming their UK residency before they continue with the study. All the track chances have now been removed.</p>
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<p>plus still some references to America/n to be edited</p> <p>Finally – please remove all tracked changes for final submission</p>	
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REVIEWER COMMENTS
COMMENTS

APPLICANT RESPONSE TO REVIEWER

(OTHER THAN SPECIFIC RECOMMENDATIONS)

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Please retain this notification for future reference. If you have any queries please do not hesitate to contact the School of Education ethics administrative contact for UG and PGT Applications: education-ethics@glasgow.ac.uk

End of Notification.

1.2 – Participant Information



Plain Language Statement

Study Title: Influence of acculturation on variances in mate preferences.

Researcher Details:

Principal researcher: Aishwarya Iyer (@student.gla.ac.uk)

Supervisor: Dr. Joanna Wincenciak (Joanna.Winceciak@glasgow.ac.uk)

Degree: Msc. Psychological Studies (conversion)

Invitation Paragraph:

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

1. What is the purpose of this study?

One of the most common influences of an individual's attitude and behaviour, in terms of romantic or sexual partners, is one's own culture. Previous research has often found that individuals who identify with more than one culture, adapt to new cultures by acquiring new attitudes and behaviours, that contribute to their changing self-identity. The present research is being conducted to understand the relationship between acculturation (the process by which one is influenced by one's heritage culture and host culture) and preference of potential mate. The entire experiment will take 10-20 minutes of the participants' time.

2. Why have I been chosen?

You have been chosen because you are 18 years old or older, currently living in the UK and have responded to the information regarding the experiment (in the form of email or social

media posts). This research aims to recruit about 200 participants. While the experiment is open to participants from various nationalities and ethnicities, it will only be considering those who are currently living in the UK.

3. Do I have to take part?

It is up to you to decide whether or not to take part, as participation is voluntary. If you decide to take part, you are still free to withdraw at any time and without giving a reason.

4. What will happen to me if I take part?

The experiment will last about 10-20 minutes. You will be first asked to fill in a short demographics survey to collect basic details of age, sex, nationality and country of residence. Following that, you will be shown different faces, and asked to choose the face you find most attractive. Then, you will be asked to fill a short questionnaire (an adapted version of Vancouver Index of Acculturation) to understand the nature of your cultural identity, relating to your host culture (UK) and your heritage culture.

5. Will my taking part in this study be kept confidential?

Since the experiment will be conducted online, no identifying or personal information will be collected from the participants. You will not be mentioned by any identifying information, such as name, in the research. For the sake of this research study, your nationality and country of residence will be discussed as influential factors in the research. Since the experiment will be conducted online, you will be able to maintain complete anonymity. Any information collected from you will be completely anonymised.

Please note that assurances on confidentiality will be strictly adhered to unless evidence of wrongdoing or potential harm is uncovered. In such cases the University may be obliged to contact relevant statutory bodies/agencies.

6. What will happen to the results of the research study?

All the anonymized data will be kept confidential and analysed for the research. Once the research project has ended at the completion of the degree, all data will be kept for a duration of 5 years for future publications. The data will be destroyed 5 years after the end of the research project. If you'd like to obtain a copy of the result, you are encouraged to write an email to the principal researcher, who will then forward you the result. You will not be identified in any report/publication.

7. Who has reviewed the study?

The study has been reviewed by the School of Education Ethics Forum.

Contact for further information

For any clarifications or further information, you can contact the principal researcher (2306592I@student.gla.ac.uk) or the supervisor (Joanna.Wincenciak@glasgow.ac.uk)

If you have any concerns regarding the conduct of this research project, you can contact the School of Education Ethics Officer Dr. Kara Makara, email: kara.makarafuller@glasgow.ac.uk

1.3 Consent Form



Participant Consent Form*

*Please note that the study will be conducted online and the consent will be obtained by participant checking the box at the end this (online) form

Study Title: Influence of acculturation on variance in mate preferences

Researcher Details:

Principal researcher: Aishwarya Iyer (@student.gla.ac.uk)

Supervisor: Dr. Joanna Wincenciak (Joanna.Winceciak@glasgow.ac.uk)

Degree: Msc. Psychological Studies (conv)

I confirm that I have read and understand the Plain Language Statement for the above study and have had the opportunity to ask questions.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

I confirm that I am 18 years old or older.

I confirm that I am currently residing in the UK.

I agree to take part in the above study.

Please note that the study was conducted online at:
<https://www.faceresearch.org/project?accultmp&auto>

2.1 Stimuli used for attractiveness experiment

a



b



2. 3 Vancouver Index of Acculturation (VIA) (Adapted)

Please circle *one* of the numbers to the right of each question to indicate your degree of agreement or disagreement.

Many of these questions will refer to your *heritage culture*, meaning the original culture of your family (other than British). It may be the culture of your birth, the culture in which you have been raised, or any culture in your family background. If there are several, pick the one that has influenced you *most* (e.g. Irish, Chinese, Mexican, African). If you do not feel that you have been influenced by any other culture, please name a culture that influenced previous generations of your family. Your heritage culture (other than British) is: _____

Disagree

Agree

1 2 3 4 5 6 7 8 9

1. I often participate in my *heritage* cultural traditions.
1 2 3 4 5 6 7 8 9
2. I often participate in mainstream British cultural traditions.
1 2 3 4 5 6 7 8 9
3. I would be willing to marry a person from my *heritage culture*.
1 2 3 4 5 6 7 8 9
4. I would be willing to marry a white British person.
1 2 3 4 5 6 7 8 9
5. I enjoy social activities with people from the same *heritage culture* as myself.
1 2 3 4 5 6 7 8 9
6. I enjoy social activities with typical British people.
1 2 3 4 5 6 7 8 9
7. I am comfortable interacting with people of the same *heritage culture* as myself.
1 2 3 4 5 6 7 8 9
8. I am comfortable interacting with typical British people.
1 2 3 4 5 6 7 8 9

9. I enjoy entertainment (e.g. movies, music) from my *heritage culture*.
1 2 3 4 5 6 7 8 9
10. I enjoy British entertainment (e.g. movies, music).
1 2 3 4 5 6 7 8 9
11. I often behave in ways that are typical of my *heritage culture*.
1 2 3 4 5 6 7 8 9
12. I often behave in ways that are typically British.
1 2 3 4 5 6 7 8 9
13. It is important for me to maintain or develop the practices of my *heritage culture*.
1 2 3 4 5 6 7 8 9
14. It is important for me to maintain or develop British cultural practices.
1 2 3 4 5 6 7 8 9
15. I believe in the values of my *heritage culture*.
1 2 3 4 5 6 7 8 9
16. I believe in mainstream British values.
1 2 3 4 5 6 7 8 9
17. I enjoy the jokes and humour of my *heritage culture*.
1 2 3 4 5 6 7 8 9
18. I enjoy British jokes and humour.
1 2 3 4 5 6 7 8 9
19. I am interested in having friends from my *heritage culture*.
1 2 3 4 5 6 7 8 9
20. I am interested in having British friends.
1 2 3 4 5 6 7 8 9