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UNIVERZITA KARLOVA
1. lékařská fakulta

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Asortativní párování u člověka

Assortative mating in humans

Disertační práce

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Abstrakt

Výběr partnera není náhodný. Nenáhodné (asortativní) párování může být pozitivní (homogamie), kdy lidé preferují a vybírají si partnery se soběpodobnými charakteristikami, nebo negativní (heterogamie, komplementarita), kdy naopak preferují charakteristiky soběodlišné. Více než sto let výzkumu ukázalo, že v párování se významně častěji uplatňuje princip homogamie. Předložená práce má dva hlavní cíle. Zaprvé, kriticky shrnout současný stav poznání v oblasti pozitivního nenáhodného párování (konkrétně empirickou podporu, faktory ovlivňující homogamii, mechanismy jejího vzniku, vztahové a genetické dopady a metodická úskalí výzkumu). Přiložené teoretické práce se zabývají dalšími mechanismy nenáhodného párování (homogamie, imprinting-like efekt, heterogamie, komplementarita). Zadruhé, testovat nenáhodné párování u ideálních (preference) i skutečných (reálný výběr) partnerů v závislosti na pohlaví, sexuální orientaci (heterosexuální a neheterosexuální) a populaci (Brazílie a Česká republika). Výsledky přiložených studií ukázaly, že při výběru partnera se uplatňuje princip homogamie, a to nezávisle na pohlaví a populaci. V případě sexuální orientace byla silnější homogamie nalezena u heterosexuálních než homosexuálních partnerů, nicméně preference pro homogamii se v závislosti na sexuální orientaci nelišily. Výsledky studií významně přispívají k pochopení interindividuální variability nenáhodného párování. Přílohu práce tvoří sedm publikací na zkoumané téma.

Klíčová slova: výběr partnera; partnerské preference; nenáhodné párování; homogamie; imprinting-like efekt; sexuální orientace; mezikulturní výzkum

Abstract

Human mate choice is far from random. Assortative mating can be either positive (homogamy), when people prefer and choose partners with self-similar characteristics, or negative (heterogamy, complementarity), when people prefer self-dissimilar partners. Over one hundred years of research, it has been shown that people generally couple based on the principle of homogamy. This thesis seeks to address the following two goals. First, it critically reviews the current state of knowledge in positive assortative mating (in particular, empirical support, factors affecting homogamy, mechanisms of homogamy, relationship and genetic impact of homogamy, and methodological pitfalls of research). This section includes theoretical papers deal with further mechanisms of assortative mating (homogamy, imprinting-like effect, heterogamy, complementarity). Second, the thesis provides further test of assortative mating in 'ideal partners' (preferences) and actual partners, in the context of sex, sexual orientation (heterosexual and non-heterosexual), and population (Brazil and Czech Republic). Results of these studies show that the principle of homogamy is valid irrespective of sex and population. However, they find a stronger tendency for homogamy in actual partners among heterosexuals than in homosexuals, although there were no significant differences in preferences. The results considerably contribute to understanding of interindividual variability in assortative mating. The part of thesis are seven publications on the studied topic.

Key words: mate choice; partner preferences; assortative mating; homogamy; imprinting-like effect; sexual orientation; cross-cultural research

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Úvod

Proč si lidé vybírají partnery, jaké si vybírají? Důležitou roli hraje mnoho různých mechanismů, přičemž jedním z nejvýznamnějších je nenáhodné párování (Buss, 2016), které může být pozitivní (homogamie) nebo negativní (heterogamie, komplementarita; Alvarez & Jaffe, 2004; Thiessen & Gregg, 1980; Vandenberg, 1972). Významně větší empirickou podporu dosud získal princip homogamie (Buston & Emlen, 2003), na který se primárně zaměřuje i předložená práce. Partneři si jsou vzájemně podobní zejména v socio-demografických charakteristikách, následovanými charakteristikami psychologickými a fyzickými. V teoretickém úvodu jsou shrnuty studie zabývající se homogamií a následně jsou představeny faktory, které ji ovlivňují (např. míra závazku). Jelikož je homogamie u prefereovaných i skutečných partnerů nacházena napříč časem, různými kulturami, sexuálními orientacemi i typy vztahů, mohlo by se jednat o „univerzální" párovací strategii. K učinění obdobného závěru je ovšem nezbytný další, zejména mezikulturní, výzkum.

Ačkoli v průběhu více než sto let výzkumu nenáhodného párování vzniklo obrovské množství studií, stále není zřejmé, jakými mechanismy vzájemná podobnost partnerů vzniká. Preference pro homogamii se mohou vyskytovat již před navázáním vztahu, samotná homogamie mezi partnery může vzniknout různými způsoby seznamování se a tlaky „partnerského trhu", ale taktéž může vznikat v průběhu soužití coby následek společných interakcí (Luo, 2017). Existují čtyři základní mechanismy vzniku homogamie: preference pro soběpodobnost (aktivní mechanismus homogamie), vedlejší produkt fungování „partnerského trhu" (pasivní mechanismus homogamie), proximita neboli sociální homogamie a konvergence (připodobňování). Valná většina studií pouze koreluje charakteristiky partnerů, přičemž mechanismy vzniku přímo netestuje. V teoretickém úvodu jsou mechanismy vzniku homogamie blíže představeny, jelikož k porozumění konceptu nenáhodného párování je pochopení fungování jeho jednotlivých mechanismů klíčové.

Podobnost partnerů v různých charakteristikách může mít pro vztah různé benefity. Homogamie v charakteristikách s větší mírou dědivosti (např. fyzické charakteristiky) může vést k přenosu více vlastních, respektive společných genů do další generace, zatímco podobnost v charakteristikách s menší mírou dědivosti (např. postojové, demografické) může přispívat k většímu porozumění, snižování konfliktů atd., a tím zvyšovat partnerskou spokojenost.

Závěrečná část teoretického úvodu se zabývá metodickými úskalími výzkumu homogamie, které mohou vést k nekonzistentním výsledkům napříč jednotlivými studiemi.

Cílem empirické části práce, která sestává ze sedmi samostatných textů (viz Přílohy), je zejména rozšířit výzkum homogamie do oblastí, které byly dosud přehlíženy. Valná většina předchozích studií zkoumala asortativní párování výhradně u heterosexuálních jedinců, a proto jsme se v některých našich studiích zaměřili na jedince neheterosexuální orientace. Ačkoli v poslední době vznikají studie i v nezápadních společnostech, jejich zastoupení je stále marginální. Naše studie jsou založeny na vzorcích z České republiky a Brazílie, což jsou země vzájemně se lišící historií, geografií i kulturou. Dosavadní studie většinou zkoumaly výhradně partnerské preference nebo partnerský výběr. Různé výzkumné vzorky a strategie ovšem mohou vést k odlišným výsledkům, přičemž není jasné, je-li to důsledkem zkoumané problematiky nebo použité metodiky. Z tohoto důvodu jsme testovali současně jak preferovanou, tak skutečnou míru homogamie. Současně jsme se zaměřili na další mechanismus, tzv. impritning-like efekt, který může vést k podobnosti partnerů. Závěry našich studií tak přispívají pochopení, zda je fungování homogamie kulturně specifické, závislé na pohlaví a sexuální orientaci, jak se liší v případě preferencí a skutečného výběru a v neposlední řadě, jak souvisí s dalšími mechanismy výběru partnera, jako je zmiňovaný imprinting-like efekt.

1. Teoretický úvod

1.1. Nenáhodné párování

Nenáhodné párování označuje tendenci jedinců párovat se na základě určitých systematických vzorců. Nejčastěji pojem referuje k párování na základě podobnosti (pozitivní nenáhodné párování neboli homogamie) nebo naopak odlišnosti (negativní nenáhodné párování neboli heterogamie, komplementarita; Thiessen & Gregg, 1980; Vandenberg, 1972). Partnerská podobnost se systematicky zkoumá od roku 1903, kdy Karl Pearson (1903) publikoval studii zaměřenou na homogamii párů ve fyzických charakteristikách (postava, rozpětí paží, délka předloktí) a délce dožití (Pearson, 1903). Od té doby se výzkum podobnosti partnerů rozšířil na mnoho dalších demografických, psychologických, postojových, fyzických či behaviorálních charakteristik. V současně době se výzkum asortativního párování začíná zaměřovat i na jedince jiné než heterosexuální orientace a pocházejí z různých kultur, což je pro případnou generalizaci závěrů klíčové.

1.1.1. Zkoumané charakteristiky

1.1.1.2. Socio-demografické charakteristiky

Demografické charakteristiky patří z hlediska výzkumu asortativního párování dlouhodobě mezi nejzkoumanější charakteristiky a současně je u nich nacházena největší partnerská podobnost (Luo, 2017).

Páry se nejčastěji vzájemně podobají ve věku (korelační koeficienty variují mezi 0,7 a 0,9; Bereczkei, Gyuris, Koves, & Bernath, 2002; Esteve, Cortina, & Cabré, 2009; George et al., 2015; Watson et al., 2004). Zajímavé je, že věková homogamie zůstává v průběhu času konstantní (Van de Putte et al., 2009).

Naopak výskyt etnické a náboženské homogamie v průběhu 20. století klesá ve všech západních společnostech (Frimmel, Halla, & Winter-Ebmer, 2013; Kalmijn, 1991; Schwartz, 2013) a to navzdory skutečnosti, že párování se s jedinci ze své vlastní etnické skupiny je např. v USA stále normou (Schwartz & Graff, 2009). Například sňatky mezi Židy a jedinci jiného vyznání v USA v posledních desetiletích vzrostly (Kalmijn, 1998) a naopak náboženská

homogamie mezi katolíky a protestanty v Nizozemí klesla (Hendrickx, Lammers, & Ultee, 1991).

Jak bylo naznačeno výše, od 2. poloviny 20. století je na vzestupu homogamie ve vzdělání (korelační koeficienty variují mezi 0,4 a 0,6; Blackwell, 1998; Halpin & Chan, 2003; Jaffe & Chacon-Puignau, 1995; Kalmijn, 1991; Schwartz, 2010b; Schwartz & Mare, 2005; Stevens, 1991). Díky přístupu žen ke vzdělání a na pracovní trh vzrůstá také homogamie v socioekonomickém statusu (Glick, 1988; Sweeney & Cancian, 2004).

Dlouhodobý výzkum asortativního párování ukazuje, že výběr partnera s ohledem na socio-demografické charakteristiky významně odráží vývoj společnosti. Ačkoli se v závislosti na společenských okolnostech proměňují charakteristiky, v nichž se partneři vzájemně podobají, je zajímavé, že homogamie je nacházena dlouhodobě a systematicky. Budoucí výzkum by se měl zaměřit na mechanismy jejího vzniku, respektive je-li podobnost partnerů v socio-demografických charakteristikách důsledkem preferencí pro soběpodobnost nebo např. vedlejším důsledkem fungování „partnerského trhu“ (viz kapitola 1.1.3. Mechanismy vzniku homogamie).

1.1.1.3. Psychologické charakteristiky

Postoje, hodnoty, životní styl

V případě postojů a hodnot se výzkumy tradičně zaměřují na charakteristiky, jako je politická orientace, religiozita, hodnoty, postoje k rodinným rolím, ochota riskovat atd. (např. Bacon, Conte, & Moffatt, 2014; Caspi & Herbener, 1993; Feng & Baker, 1994; Watson et al., 2004). Korelační koeficienty mezi partnery jsou v případě postojů obvykle středně silné (0,4 až 0,7; Han, Weed, & Butcher, 2003; Luo & Klohnen, 2005), zatímco v případě hodnot spíše slabé (od 0,1 do 0,4; Luo, 2017). Slabá až středně silná korelace (0,2 až 0,5) byla mezi partnery nalezena i v životním stylu, koníčcích a návycích (např. požívání kávy, čaje a alkoholu, cirkadiánním cyklu či cvičení; Burgess & Wallin, 1943; Buss, 1984; Epstein & Guttman, 1984; George et al., 2015; Randler & Kretz, 2011).

Postoje a hodnoty jsou charakteristiky, které se na rozdíl od jiných (např. etnicita) mohou měnit. Intuitivně bychom tak mohli očekávat vyšší míru homogamie u dlouhodobých

partnerů, kteří mohou své postoje a hodnoty v průběhu času vzájemně přizpůsobovat. Výše uvedené studie byly ovšem prováděny na párech s různou mírou závazku, tedy od těch, které spolu chodí, až po dlouhodobé manžele. Tato skutečnost naznačuje, že partneři se na základě soběpodobnosti už párují, tedy že homogamie v postojích, hodnotách a životním stylu nevzniká následkem soužití (viz kapitola 1.1.3. Mechanismy vzniku homogamie). Aby však mohl být učiněn obdobný závěr, je nezbytné buď přímo testovat míru homogamie v daných charakteristikách u vztahů s různou mírou závazku, nebo páry sledovat longitudinálně.

Kognitivní schopnosti a inteligence

V případě kognitivních schopností (např. percepční rychlost, verbální schopnosti, prostorová orientace) a inteligence je mezi partnery nacházena středně silná korelace (0,2 až 0,5; Burleson & Denton, 1992; Buss, 1984; Guttman, 1974; Mascie-Taylor, 1989; van Leeuwen, van den Berg, & Boomsma, 2008; Watson et al., 2004), která se s délkou trvání partnerství nemění (Burleson & Denton, 1992). Tyto výsledky naznačují, že lidé se na základě podobnosti v kognitivních schopnostech již párují, než že k podobnosti dochází důsledkem konvergence v průběhu soužití (viz kapitola 1.1.3. Mechanismy vzniku homogamie). Ve studii zkoumající homogamii v kognitivních schopnostech novomanželů (Watkins & Meredith, 1981) byly nalezeny korelační koeficienty, které se signifikantně nelišily od těch nalezených u dlouhodobých manželů, kteří měli děti (Johnson et al., 1976; Zonderman, Vandenberg, Spuhler, & Fain, 1977).

Současně se ukazuje, že k vzájemné podobnosti partnerů v inteligenci může docházet různými mechanismy, které se v průběhu času mění (van Leeuwen et al., 2008). Studie zkoumající dvojčata a jejich partnery dospěla k závěru, že dříve hrála hlavní roli ve vzniku homogamie proximita (Reynolds, Baker, & Pedersen, 1996), zatímco recentní studie naznačuje, že se jedná spíše o důsledek preferencí pro soběpodobnost (van Leeuwen et al., 2008). I v tomto případě zůstává otázkou, zda jsou rozdílné výsledky důsledkem odlišných metod či změnou ve způsobech párování v průběhu času.

Review, v němž autoři zpracovali studie z let 1928-1979, naznačuje, že průměrná homogamie v kognitivních schopnostech v průběhu času klesá (Johnson, Ahern, & Cole, 1980). Autoři ovšem upozorňují na významné metodické rozdíly napříč studiemi (např. reliabilita

dříve používaných testů nebyla dostatečná, používání různých dotazníků a testů, zaměření na různé kognitivní schopnosti). Z těchto důvodů nelze jednoznačně říci, zda k poklesu homogamie v kognitivních schopnostech v průběhu času opravdu dochází či nikoli (Johnson, Ahern, & Cole, 1980).

Osobnostní charakteristiky

Výzkumů zkoumajících homogamii partnerů v osobnostních charakteristikách je velké množství; některé z nich se zaměřují na charakteristiky Velké Pětky (extraverze, neuroticismus, otevřenost novým zkušenostem, přívětivost, svědomitost; Abdel-Rahim, Nagoshi, Johnson, & Vandenberg, 1988; Buss & Barnes, 1986; Little, Burt, & Perrett, 2006; Mccrae et al., 2008; Rammstedt & Schupp, 2008), jiné např. na sebevědomí (*self-esteem*), pozitivní či negativní afektivitu, temperament apod. Některé studie nenalezly žádnou podporu pro asortativní párování (Eaves et al., 1999; Farley & Davis, 1977), jiné pozitivní (korelační koeficienty jsou nízké, obvykle variují mezi 0,1 a 0,3; Botwin, Buss, & Shackelford, 1997; Eysenck, 1974; Lake, Eaves, Maes, Heath, & Martin, 2000; Luo, 2009; Štěrbová et al., 2017; Watson et al., 2004) a jiné dokonce negativní (Markey & Markey, 2007).

Velice důležitá je ovšem distinkce mezi preferencemi a skutečným výběrem. Studie ukazují, že lidé vykazují výrazně vyšší preference pro homogamii, než jak si jsou podobní se svými skutečnými partnery (Figueredo, Sefcek, & Jones, 2006; Štěrbová et al., 2017). Diskrepance mezi preferencemi a skutečným výběrem (Courtiol, Picq, Godelle, Raymond, & Ferdy, 2010; Dijkstra & Barelds, 2008) může být důsledkem kompromisů, které lidé při párování dělají (viz kap. 1.1.3.2. Vedlejší efekt fungování „partnerského trhu“).

Otázkou tedy zůstává, proč je homogamie v osobnostních charakteristikách mezi skutečnými partnery tak nízká. Jedním z možných vysvětlení je, že má jen marginální dopad na partnerskou spokojenost (Dyrenforth, Kashy, Donnellan, & Lucas, 2010), zatímco osobnostní charakteristiky obou partnerů ji ovlivňují významně více (Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Robins, Caspi, & Moffitt, 2000). Preference pro soběpodobného partnera v osobnosti by tak mohly být důsledkem obecných preferencí pro soběpodobnost, ale do skutečného výběru se už nemusí

promítnout, protože nepřináší vztahu žádné výhody (viz kap. 1.1.4.1. Vztahové důsledky homogamie).

Mentální zdraví a psychopatologie

V případě mentálního zdraví a psychopatologií (např. afektivní a schizofrenní poruchy, autismus, antisociální chování, alkoholismus) je mezi partnery obvykle nacházena středně silná korelace (0,2 až 0,5; Baron-Cohen, 2006; Chang & Chan, 2007; Frisell, Pawitan, Långström, & Lichtenstein, 2012; Maes et al., 1998; Mathews & Reus, 2001). Zajímavé je, že lidé s psychickými poruchami se párují s partnery s podobným typem poruchy, jako mají oni sami (nemusí jít tedy o totožnou poruchu). Např. schizofrenici si nacházejí partnery se schizoidní, paranoidní či hraniční poruchou osobnosti, ale nikoli s poruchami afektivnímimi nebo neurotickými (Parnas, 1985).

Stejně jako u homogamie v jiných charakteristikách i v případě psychopatologie může hrát významnou roli proximita (viz kapitola 1.1.3.3. Proximita), tedy že jedinci s určitou poruchou se potkají a vzájemně se zaujmou s vyšší pravděpodobností než jedinci s poruchou jinou či žádnou (Krueger, Moffitt, Caspi, Bleske, & Silva, 1998). U některých typů poruch (např. antisociální chování či alkoholismus) navíc může docházet ke konvergenci, kdy se partneři mohou v daném chování vědomě či nevědomě podporovat a utvrzovat, čímž se může stav obou zhoršovat (Rhule-Louie & McMahon, 2007). Jako velice žádoucí se tak do budoucna jeví longitudinální studie, které by sledovaly dopad homogamních/heterogamních svazků na průběh poruchy a vliv na well-being daného jedince. Homogamie v psychopatologii by mohla mít vztahové důsledky jak pozitivní (např. partneři se mohou navzájem lépe chápat), tak negativní (např. vzájemný vliv v případě alkoholismu), což by se mohlo lišit poruchu od poruchy. Takovéto znalosti by mohly být následně přínosné pro psychoterapeutickou část léčby. V případě asortativního párování v psychopatologii je ovšem zásadní i jeho genetický dopad. Ačkoli není etiologie mnoha mentálních poruch přesně známá, mnoho z nich alespoň částečně obsahuje dědičnou komponentu (Raboch & Zvolský, 2001). Asortativní párování v psychiatrických poruchách tak může mít závažný důsledek ve zvýšené pravděpodobnosti předání poruchy do dalších generací (Merikangas & Spiker, 1982). Poruchy mohou navíc ovlivňovat i samotné rodičovství a styly výchovy. Budoucí výzkum by se tak měl zaměřit nejen

na testování přímých genetických vlivů, ale i na dopady způsobené prostředím (např. výchova dětí).

1.1.1.4. Fyzické charakteristiky

Homogamie mezi partnery byla nalezena také v různých fyziologických (např. krevní tlak, hladina cholesterolu; Di Castelnuovo, Quacquaruccio, Donati, De Gaetano, & Iacoviello, 2009; Peek & Markides, 2003) a fyzických charakteristikách (např. tělesná hmotnost; Allison et al., 1996; Speakman, Djafarian, Stewart, & Jackson, 2007), výška (Courtiol, Raymond, Godelle, & Ferdy, 2010; Seki, Ihara, & Aoki, 2012), barva očí (Laeng, Mathisen, & Johnsen, 2006; Pennock-Roman, 1984), obličejové rysy (Bereczkei, Gyuris, & Weisfeld, 2004; Bovet, Barthes, Durand, Raymond, & Alvergne, 2012) či fyzická atraktivita (Alan Feingold, 1988; Shepherd & Ellis, 1972). Některé studie ovšem preference pro homogamii nenalezly (např. Lindová et al., 2016). Korelační koeficienty podobnosti partnerů jsou obvykle nízké (0,1 až 0,3).

Studie současně ukazují, že vnímaná obličejová podobnost zvyšuje atraktivitu (Penton-Voak, Perrett, & Peirce, 1999) a důvěryhodnost tváří (Debruine, 2002), což by mohlo být vysvětleno prizmatem teorie příbuzenského výběru, kdy mezi příbuznými (tedy podobnými) jedinci dochází k vyššímu altruismu a kooperativnímu chování (Hamilton, 1964). Příliš vysoká míra podobnosti by ovšem mohla vést k inbreedingu (příbuzenské křížení), které má řadu negativních dopadů. Z uvedených důvodů by mohlo být nejvýhodnější nalézt si partnera, který je podobný, ale ne příliš (tzv. optimální outbreeding; Bateson, 1983), což podporuje nacházená, ač slabá, tak signifikantní podobnost partnerů ve fyzických charakteristikách (viz kap. 1.1.4.2. Genetické důsledky homogamie).

1.1.2. Faktory ovlivňující míru homogamie

Mechanismus homogamie je výzkumníky považován za univerzální, ačkoli valná většina dosavadní empirické podpory je postavena na heterosexuálních jedincích ze západní Evropy a USA. Proto zůstává otázkou, nakolik je možné získané poznatky generalizovat na ostatní populace a skupiny obyvatel. Je-li mechanismus homogamie opravdu univerzální, měl by být do určité míry nezávislý na kultuře či interindividuálních rozdílech. Jinými slovy by se

homogamie mohla projevovat všude, ale ne stejně (např. v závislosti na postavení žen ve společnosti).

1.1.2.1. Závazek a délka vztahu

Reprezentativní studie pracující s rozsáhlými soubory ukazují, že páry, které jsou sezdané a které spolu chodí, se v míře homogamie neliší (pro přehled Luo, 2017). Jsou-li nalezeny nějaké rozdíly, jako mírně podobnější se ukazují býti sezdané páry. Výzkumy se většinou zaměřují na podobnost ve věku, vzdělání, etnicitě a náboženském vyznání (Blackwell & Lichter, 2000, 2004; Jaffe & Chacon-Puignau, 1995; Schwartz, 2010b; Stevens & Schoen, 1988; Verbakel & Kalmijn, 2014). Jinými slovy, páry s nižší mírou závazku vykazují srovnatelnou soběpodobnost se sezdanými páry (Luo, 2009).

Tyto výsledky naznačují, že lidé si své partnery na základě soběpodobnosti již vybírají, a nikoli že se partneři v průběhu času začnou vzájemně připodobňovat. Budoucí výzkumy by se ovšem měly zaměřit i na jiné než sociodemografické charakteristiky, jelikož ve vztazích s různou mírou závazku může hrát důležitou roli soběpodobnost v jiných charakteristikách. Například v případě krátkodobých vztahů by mohly hrát významnější roli fyzické charakteristiky, zatímco v případě dlouhodobých psychologické, které nejsou na první pohled viditelné, ale mají významný dopad na fungování vztahu. Je ovšem důležité si uvědomit, že jednotlivé charakteristiky na sobě nejsou nezávislé. Studie například ukazují, že lidé jsou schopni na základě fotografií tváří schopni odhadovat inteligenci či osobnostní charakteristiky (Kleisner, Chvátalová, & Flegr, 2014; Little et al., 2006).

1.1.2.2. Kultura

Valná většina výzkumů se doposud zaměřovala výhradně na západní populace (západní Evropa a USA), ačkoli kultura může hrát ve výběru partnera významnou roli (např. dohodnutá manželství versus individuální výběr partnera; Apostolou, 2017; Buunk, Park, & Duncan, 2010). Pro pochopení, co je v partnerském výběru ovlivněno kulturou a co je na ní méně závislé, je nezbytné zkoumat preference a chování v co nejvíce různých populacích (Buss, 1989; Schmitt, 2005).

Mezi několik málo výjimek patří studie z Číny (Chen, Luo, Yue, & Xu, 2009), která se zaměřila na vzájemnou podobnost novomanželů. Výsledky ukázaly, že míra homogamie čínských párů v demografických charakteristikách a postojích je srovnatelná s homogamií v západních společnostech, ačkoli čínské páry vykazovaly silnější homogamii v osobnostních charakteristikách (korelační koeficient mezi 0,33 a 0,66). Výsledky této studie naznačují, že v odlišných kulturách by mohla hrát různě důležitou roli homogamie v jiných charakteristikách. Tento závěr podporuje i studie provedená v Egyptě, která ukázala, že podobnost partnerů v kognitivních schopnostech a osobnostních charakteristikách je vyšší než u Američanů (Abdel-Rahim et al., 1988). Studie tak ukázala na problematičnost generalizování výsledků prováděných v západních společnostech, které se od jiných mohou významně lišit (např. již zmiňovaná dohodnutá manželství, sociální stratifikace, důraz na jiné hodnoty podle míry industrializace a individualizace; Schwartz & Sagie, 2000). Naše studie testující rozdíly v preferované a skutečné homogamii mezi Brazilci a Čechy v osobnostních charakteristikách (Štěrbová et al., 2017), relativní tělesné výšce (Valentova, Bártová, et al., 2016), míře tělesného ochlupení a délce vousů (Valentova, Varella, Bártová, Štěrbová, & Dixson, 2017), či poměru pasu a boků (WHR; Valentova et al., 2017) ovšem žádné významné rozdíly nenašly. Stejně tak nebyly nalezeny žádné rozdíly mezi Američany a Němci v tendenci vyhledávat nové zážitky (*sensation seeking*; Farley & Davis, 1977).

Doposud provedené studie tak naznačují, že tendence k homogamnímu párování by mohla být spíše kulturně nepodmíněná, nicméně by se mohla lišit míra podobnosti partnerů v různých charakteristikách. Studie zaměřená na absolutní partnerské preference (nacházené v průměru u mužů a žen) ukázala, že napříč 53 kulturami se preference liší více v osobnostních než ve fyzických charakteristikách (Lippa, 2007). Nicméně zůstává otázkou, zda stejný vzorec můžeme očekávat i v případě relativních preferencí (preference ovlivněné vlastními charakteristikami a zkušenostmi, mezi které se řadí i homogamie). Mezikulturním rozdílům v absolutních preferencích se doposud věnovalo poměrně velké množství studií (např. Buss, 1989; Cunningham, Roberts, Barbee, Druen, & et al, 1995; Gangestad, Haselton, & Buss, 2006; Shackelford, Schmitt, & Buss, 2005), pročež budoucí výzkum by se měl začít systematicky věnovat i mezikulturnímu srovnání preferencí relativních.

1.1.2.3. Sexuální orientace

Jsou-li preference pro soběpodobnost univerzální, měly by být do určité míry nezávislé na pohlaví, sexuální orientaci, kultuře a dalších faktorech, které partnerský výběr ovlivňují (např. Buss, 1989; Lippa, 2007). V případě homogamie mezi partnery bychom ovšem mohli mezi heterosexuálními a neheterosexuálními jedinci očekávat určité rozdíly kvůli menšímu „partnerskému trhu“ (McFarland, 1975; viz kap. 1.1.3.2. Vedlejší efekt fungování „partnerského trhu“), na kterém se neheterosexuální jedinci pohybují.

Dosavadní studie se zaměřovaly převážně na socio-demografické charakteristiky, v nichž se homogamie mezi heterosexuálními partnery ukazuje nejčastěji (viz kapitola 1.1.1.2. Socio-demografické charakteristiky). U homosexuálních jedinců byla nalezena homogamie ve věku, vzdělání a typu zaměstnání (Peplau, Cochran, & Mays, 1997). Současně se ukázalo, že homosexuální jedinci preferují partnery podobného věku (Harry & DeVall, 1978; Silverthorne & Quinsey, 2000), jsou obdobně maskulinní/femininní (Bailey, Kim, Hills, & Linsenmeier, 1997), dominantní (Valentova, Stulp, Třebický, & Havlíček, 2014), mají podobnou délku vousů (Valentova et al., 2017), poměru pasu a boků (WHR), velikost a tvar prsou či velikosti hýždí (Valentova et al., 2017). Naopak homogamie nebyla nalezena v případě dětské ani dospělé genderové nonkonformity (Bártová et al., 2017), osobnostních charakteristik (Štěrbová et al., 2017) ani preferencí pro míru tělesného ochlupení (Valentova et al., 2017). Jiná studie dokonce nalezla heterogamii homosexuálních párů v maskulinitě/femininitě (Peplau & Cochran, 1990)

Studie testující míru homogamie u heterosexuálních a homosexuálních párů v sociodemografických charakteristikách (věk, vzdělání, etnicita, výše výdělku apod.) ukazují, že všechny páry vykazují určitou míru soběpodobnosti, přičemž nejvyšší homogamie byla nalezena u heterosexuálních sezdaných párů a nejnižší u mužských homosexuálních párů (Andersson, Noack, Seierstad, & Weedon-Fekjaer, 2006; Jepsen & Jepsen, 2002; Schwartz & Graff, 2009; Verbakel & Kalmijn, 2014). Studie zaměřená na relativní výšku ukázala, že heterosexuální jedinci preferují, když je muž vyšší než žena, zatímco neheterosexuální jedinci preferují podobnou výšku partnerů (Valentova, Bártová, et al., 2016). U pohlavně dimorfních znaků je ovšem rozdíl mezi heterosexuály a homosexuály očekávatelný.

Jak bylo zmíněno v úvodu této kapitoly, nižší míra podobnosti by mohla být důsledkem menšího „partnerského trhu“ neheterosexuálních jedinců, díky čemuž pro ně může být

komplikovanější nalézt soběpodobného partnera (Blau & Schwartz, 1997). Dalším příkladem skupiny limitované menší velikostí „partnerského trhu“ mohou být např. rozvedení jedinci, kteří vstupují na „partnerský trh“ znovu. Vzhledem k tomu, že „partnerský trh“ rozvedených jedinců je menší a více heterogenní (Kalmijn & Flap, 2001), je otázkou, zda i přes omezenější možnosti se efekt homogamie promítá do reálného párování. Studie testující homogamii v demografických charakteristikách dospěly k závěru, že ačkoli první a vícenásobná manželství vykazují určité rozdíly či specifika (např. věková homogamie u vícenásobných manželství je nižší než u manželství prvních), homogamie v obou případech zůstává silná (Frimmel et al., 2013; Gelissen, 2004; Ni Bhrolchain, 1988; Shafer, 2012). Je tedy nižší míra homogamie u heterosexuálních jedinců důsledkem sexuální orientace nebo velikosti „partnerského trhu“? Na tuto otázku může částečně odpovědět naše studie, která zkoumala preferovanou a skutečnou homogamii heterosexuálních a homosexuálních párů (Štěrbová et al., 2017). Výsledky ukázaly, že ačkoli preferovaná míra homogamie se mezi heterosexuály a homosexuály nelišila, skuteční partneři si byli v případě heterosexuálních vztahů podobní více než v případě homosexuálů. Tyto výsledky naznačují, že nižší homogamie u homosexuálů může být způsobena specifickými obtížemi spojenými s výběrem partnera (např. menší „partnerský trh“, sociální akceptování homosexuality, comming out apod.), nicméně preference pro homogamii se zdají být podobné, což by naznačovalo univerzalitu této párovací strategie napříč sexuálními orientacemi.

1.1.3. Mechanismy vzniku homogamie

Většina dosavadních studií dospěla k závěru, že partneři si jsou vzájemně spíše podobní než nepodobní (viz kap. 1.1.1. Zkoumané charakteristiky). V různých skupinách charakteristik navíc existuje různá míra homogamie. Stále ovšem zůstává otázkou, jak homogamie mezi partnery vzniká. Valná většina studií „pouze“ koreluje charakteristiky partnerů, avšak mechanismy vzniku přímo netestuje. Existují čtyři základní mechanismy vzniku homogamie: preference pro soběpodobnost, vedlejší produkt fungování „partnerského trhu“, proximita a konvergence. Abychom mohli pochopit koncept nenáhodného párování, je nezbytné pochopit jeho mechanismy.

1.1.3.1. Preference pro soběpodobnost

Lidé vykazují preference absolutní (např. touží po tom nejatraktivnějším partnerovi, přičemž mezi lidmi panuje poměrně silný konsensus, co je atraktivní; Feingold, 1992; Langlois et al., 2000) a relativní (jedinec touží po partnerovi, který je podobně atraktivní jako on sám). Ačkoli by se mohlo zdát, že všichni lidé touží po tom co „nejlepším" partnerovi (viz absolutní preference), výzkumy testující partnerské preference ukazují, že inter-individuální variabilita preferencí napříč různými charakteristikami je poměrně vysoká. Tyto závěry naznačují, že relativní preference hrají ve výběru partnera důležitou roli (např. Buss, 1984; Valentova, Štěrbová, et al., 2016; Watson, Beer, & McDade-Montez, 2014).

Lidé často uvádějí, že by chtěli partnera, který je jim podobný. Vzájemná podobnost totiž posiluje sebe-potvrzení, přispívá vzájemnému porozumění a zvyšuje vnímanou blízkost (Aron, Aron, Tudor, & Nelson, 1991; Hitsch, Hortaçsu, & Ariely, 2010; Murray, Holmes, Bellavia, Griffin, & Dolderman, 2002). Podle hypotézy „*similarity-attraction*" jsou jako atraktivnější vnímaní soběpodobní jedinci, zatímco podle hypotézy „*attraction-similarity*" přitažlivost mezi jedinci zvyšuje vnímanou soběpodobnost (Morry, 2005), což ukazuje, že vztah mezi atraktivitou a soběpodobností může být oboustranný.

Diskrepanci mezi preferencemi a skutečným výběrem můžeme nalézt i v případě homogamie, kdy preferovaná homogamie je zpravidla vyšší než homogamie skutečná (Štěrbová et al., 2017; Watson et al., 2014). Preference pro homogamii dokonce překračují kontext partnerských vztahů, kdy se např. ukázalo, že lidé preferují soběpodobnost i v případě přátel (McPherson, Smith-Lovin, & Cook, 2001). Vzhledem ke skutečnosti, že preference pro soběpodobnost byla nalezena i v jiném než partnerském kontextu (přátelství), mohlo by se jednat o důsledek obecnějších preferencí pro to, co je nám známe (familiarita). Je tedy možné, že máme obecné preference pro soběpodobnost, ale vzhledem k faktu, že partnerský výběr je multidimenzionální, preference pro soběpodobnost se mohou do skutečného výběru promítat pouze u těch charakteristik, jejichž vzájemná podobnost u obou partnerů je jakkoli prospěšná pro samotný vztah či reprodukci (viz kap. 1.1.4.1. Vztahové důsledky homogamie). V případě

jiných charakteristik může být přínosnější vybírat si partnera na základě absolutních preferencí (např. charakteristiky související se zdravím).

Vzhledem k vzájemné podobnosti s našimi příbuznými je ovšem diskutabilní, nakolik se jedná o preference pro soběpodobnost a nakolik o preference pro podobnost našim blízkým příbuzným. V takovém případě hovoříme o tzv. imprinting-like efektu[1], kdy během rané fáze ontogeneze dochází k internalizaci charakteristik blízkých příbuzných, které později preferujeme u potenciálních partnerů. Efekt obou mechanismů lze odlišit v případě, že jedinec se svými rodiči nesdílí stejné charakteristiky (např. v případě že má jedinec, jeho partner i rodiče šedé oči, nelze určit, zda si jedinec vybral partnera na základě homogamie nebo imprinting-like efektu; má-li ovšem jedinec a jeho partner oči šedé, zatímco rodiče zelené, evidentně se při výběru uplatnil princip homogamie). Ačkoli dosud existuje jen velice málo výzkumů, které by oba mechanismy proti sobě přímo testovaly, shodně docházejí k závěru, že významnější roli hraje imprinting-like efekt (DeBruine, Jones, & Little, 2017; Štěrbová, Tureček, & Kleisner, 2018). Pro lepší pochopení fungování obou mechanismů by budoucí studie měly vždy kontrolovat efekty jak homogamie, tak imprinting-like efektu.

Soběpodobnost partnerů může být důsledkem nejen pasivního, ale i aktivního vlivu rodičů, jelikož určitou míru homogamie mezi partnery preferují nejen samotní jedinci, ale i jejich rodiče. Liší se ovšem v charakteristikách, na které kladou důraz. Zatímco rodiče preferují u svých potomků a jejich partnerů homogamii zejména ve společenském původu a náboženském vyznání, samotní jedinci preferují spíše podobnost ve vzdělání a věku (Abdel-Rahim et al., 1988; Apostolou, 2008; Kalmijn, 1993; Kalmijn & Flap, 2001).

Při výběru partnera hraje roli mnoho různých faktorů (např. zdraví, rodina, osobnost atd.), přičemž každý jedince může každému faktoru přikládat různou důležitost. Lidé jsou nuceni dělat na mnoha úrovních kompromisy, přičemž není dosud zcela jasné, jak přesně svá rozhodnutí, zda s někým naváží či nenaváží vztah, dělají. Je tedy možné, že homogamie se projeví v charakteristikách, které jsou pro jedince důležité (např. soběpodobnost ve vzdělání),

[1] Termín imprinting-like efekt odkazuje ke konceptu sexuálního imprintingu neboli vtištění (Lorenz, 1937), které je definováno přesně stanovenou senzitivní periodou (obdobím zvýšené citlivosti, během něhož ke vtištění dochází) a nezvratitelností vtištěných charakteristik. Vzhledem k tomu, že u člověka nebylo dosud načasování senzitivní periody zjištěno a nezvratitelnost „vtištěných" charakteristik je taktéž diskutabilní, výzkumníci v případě člověka referují o imprinting-like efektu (Little, Penton-Voak, Burt, & Perrett, 2003; Štěrbová & Havlíček, 2017)

zatímco v jiných, na které kladou důraz nižší nebo žádný (např. soběpodobnost v náboženském vyznání), se homogamie nemusí projevit, jelikož v takovém případě snadněji učiní kompromis. Z tohoto důvodu je důležité zkoumat současně preference i reálný výběr (Figueredo et al., 2006; Štěrbová et al., 2017).

Důležitou roli v preferencích pro homogamii může hrát také „viditelnost" charakteristik (Luo & Klohnen, 2005). Některé charakteristiky se mohou začít vyjevovat postupně (např. barva očí je na rozdíl od typu attachmentu viditelná na první pohled), pročež jejich aktivní preference by mohla být neefektivní. Je ovšem důležité si uvědomit, že různé charakteristiky spolu souvisejí (např. lidé jsou schopni na základě fyzických charakteristik správně posuzovat charakteristiky psychické; Naumann, Vazire, Rentfrow, & Gosling, 2009). Současně „méně viditelné" charakteristiky mohou mít své vlastní projevy (např. vyhýbavý attachment se může projevovat vyhýbavým chováním; Simpson, Rholes, & Nelligan, 1992). V neposlední řadě platil-li by předpoklad, že v počátečních fázích párování se homogamie bude uplatňovat nejvíce u viditelných charakteristik (Luo, 2017), měly by být preference systematicky nacházeny u fyzických rysů, na což dosavadní výzkumy neukazují (viz kapitola 1.1.1.4. Fyzické charakteristiky). Vzhledem k vzájemné provázanosti jednotlivých charakteristik se dá předpokládat, že různé charakteristiky mohou hrát v různých fázích vztahu obdobnou roli, jelikož se jedinci mohou řídit nejen podle charakteristik, které jsou viditelné, ale i podle vodítek, která ukazují na charakteristiky viditelné méně. V takovém případě je ovšem diskutabilní, nakolik je vhodné hovořit o preferencích pro soběpodobnost v attachmentu či jiných komplexních konceptů, spíše než o preferencích pro jednotlivé charakteristiky.

1.1.3.2. Vedlejší efekt fungování „partnerského trhu"

Homogamie mezi partnery nemusí vznikat pouze následkem aktivních preferencí pro soběpodobnost, ale i coby vedlejší produkt fungování „partnerského trhu". Ačkoli mohou lidé uvádět různé preference, ve skutečném výběru dělají celou řadu kompromisů. Např. ač by teoreticky mohli všichni muži preferovat tu nejatraktivnější ženu, skutečný vztah s ní naváže pouze jeden z nich, přičemž ostatní muži budou nuceni navázat vztah se ženami méně atraktivními (Hunt, Eastwick, & Finkel, 2015). O tomto fenoménu referuje tzv. *kompetiční*

hypotéza, podle níž je soběpodobnost partnerů důsledkem kompetice o atraktivní partnery (Alvarez & Jaffe, 2004). Tímto mechanismem přizpůsobování partnerského výběru vlastní pozici na „partnerském trhu“ (tzv. *mate value*; Fisher, Cox, Bennett, & Gavric, 2008; Sugiyama, 2015) může docházet ke vzniku homogamie mezi partnery (jedinec upravuje své partnerské preference až do bodu, kde se setká se svým potenciálním protějškem, který bude ochoten s ním navázat vztah), což podporuje i studie, která ukázala, že jedinci jsou při výběru partnera ochotni dělat kompromisy mezi ideálním a skutečným partnerem právě na základě vlastní mate value (Regan, 1998). Např. je-li rozvinutí některé charakteristiky potenciálními partnery ceněné (např. tělesná výška), může docházet k tomu, že se budou párovat vysocí jedinci s vysokými, a tudíž menší jedinci s menšími, jelikož na ně již „nezbydou“ žádní vysocí partneři (Courtiol, Raymond, et al., 2010). Tlak „partnerského trhu“ může samozřejmě působit i obráceným směrem, kdy např. jedinec s vysokou inteligencí bude systematicky odmítán potenciálními partnery s inteligencí nižší, díky čemuž dojde k navázání vztahu dvou vysoce inteligentních jedinců. Je ovšem otázkou, zda se tento mechanismus může uplatňovat i u charakteristik, jejichž hodnocení atraktivity je vysoce variabilní (např. extraverze a introverze).

Xie a kolegové (2015) v simulační studii ukázali, že homogamie manželů v sociálních charakteristikách nemusí vznikat pouze důsledkem preferencí, ale taktéž působením sociálních struktur (neboli párovacími možnostmi, které jsou závislé na okolním prostředí). Podobně se ukázalo, že homogamie v BMI (body mass index) mezi partnery zůstala i poté, co byl statisticky kontrolován efekt partnerských preferencí pro obezitu a BMI (Fisher et al., 2014). Tyto výsledky naznačují, že homogamie mezi partnery může vznikat i jinými mechanismy než prostřednictvím partnerských preferencí.

Vzhledem k faktu, že studie netestují přímo mechanismy vzniku homogamie, nelze s jistotou rozlišit, zda je podobnost partnerů důsledkem preferencí nebo tlaků „partnerského trhu“. Budoucí studie by tak měly být designovány prospektivně (např. Todd, Penke, Fasolo, & Lenton, 2007), kdy by byli respondenti tázáni na partnerské preference ještě před navázáním vztahu a následně by se sledovaly kompromisy, které mezi svými preferencemi a skutečným výběrem udělají. Pokud studie netestují preference pro soběpodobnost před navázáním vztahu, není možné od sebe tyto mechanismy odlišit.

1.1.3.3. Proximita

Pravděpodobnost, že se potenciální partneři vůbec setkají, vzrůstá s geografickou proximitou (blízkostí). Tento mechanismus bývá také nazýván sociální homogamie. Studie z Nizozemí např. ukázala, že polovina pozdějších partnerů od sebe žila v okruhu šesti kilometrů, přičemž nejčastější vzdálenost byla pouhý jeden kilometr (Haandrikman et al., 2008). Současně se ukázalo, že zatímco v době narození obou partnerů byl medián vzdálenosti mezi nimi 22,9 km, 5 let před kohabitací 7,8 km, tak těsně před sestěhováním to bylo pouhých 6,2 km (Haandrikman et al., 2008). Jako nejčastější místa potkávání partnerů se ukázala být škola, práce a sousedství (Kalmijn, 1991; Mare, 1991; Nielsen & Svarer, 2009; Schwartz & Mare, 2012; Stevens, 1991). Geografická proximita s sebou současně nese proximitu sociální. Např. potká-li se pár v sousedství, je pravděpodobné, že budou mít partneři podobný socio-ekonomický status apod. Podobnost partnerů v různých charakteristikách tak nemusí být nutně dána preferencí pro soběpodobnost, ani nemusí být důsledkem efektu „partnerského trhu" (tedy kompromisy při výběru partnera), ale může být dána místem, kde se partneři potkali.

Místo seznámení může predikovat homogamii mezi partnery v různých charakteristikách. Například seznámení ve škole může ústit ve větší homogamii ve vzdělání, inteligenci a věku, seznámení v práci k větší homogamii v socioekonomickém statusu, vzdělání atd. (Kalmijn, 1998; Nielsen & Svarer, 2009). Současně stejné vzdělání může vést ke stejným pracovním příležitostem, a tudíž mohou mít partneři podobné vzdělání, i když se seznámí v práci (Kalmijn & Flap, 2001). Vzdělání má navíc vliv na formování názorů, postojů apod., a tudíž homogamie ve vzdělání může zvyšovat pravděpodobnost, že si partneři budou lépe rozumět (Stevens, 1991).

Důležitou roli při seznamování hrají taktéž rodinné sítě. V USA se 15 % párů díky rodinným sítím a škole znalo dříve, než navázaly partnerský vztah. Nicméně od 2. poloviny 20. století význam rodinných sítí při seznamování systematicky klesá (Kalmijn & Flap, 2001). Je ovšem důležité si uvědomit, že vliv rodičů na výběr partnera se mezi kulturami významně liší (Apostolou, 2007, 2012, 2017), pročež závěry zjištěné v USA nelze generalizovat na celou populaci.

Přímo se dá mechanismus proximity testovat prostřednictvím místa seznámení. V současné době je populární online seznamování, kde je efekt proximity odfiltrován. Na online

seznamky se zaměřil výzkum testující homogamii manželů v osobnostních charakteristikách, emočním prožívání a zájmech (Gonzaga, Carter, & Buckwalter, 2010). Výsledky ukázaly, že partneři vykazovali signifikantní míru vzájemné podobnosti v osobnosti a zájmech ještě před spárováním. Závěry tak naznačují, že lidé, kteří si jsou podobní, se mají tendenci párovat, a to nehledě na geografickou blízkost. K obdobným závěrům dospěla i studie testující příčiny homogamie ve vzdělání, která ukázala, že soběpodobnost partnerů vzniká nikoli důsledkem proximity, nýbrž preferencemi pro soběpodobnost (Stevens, 1991). Jiné studie zjistily, že homogamie v osobnostních charakteristikách zůstává i po kontrolování základních socio-demografických charakteristik, což naznačuje, že sociální homogamie není jediným vysvětlujícím faktorem soběpodobnosti partnerů (Mascie-Taylor & Vandenberg, 1988; Watson et al., 2004). Výsledky tak naznačují, že ačkoli může hrát proximita ve formování homogamních vztahů určitou roli, její význam je při kontrolování jiných mechanismů vzniku homogamie relativně nižší, než se předpokládalo, a navíc se zdá, že společně s individualizací a globalizací společnosti její význam postupně klesá.

1.1.3.4. Konvergence

Podle mechanismu konvergence se partneři vzájemně připodobňují v průběhu soužití, jinými slovy se s dobou trvání vztahu zvyšuje jejich homogamie. Konkrétní procesy konvergence mohou být např. vzájemná synchronizace, zrcadlení neverbálního chování, stejné stravovací návyky a životní styl apod.

V jednom experimentu (Zajonc, Adelmann, Murphy, Niedenthal, & Niedenthal, 1987) byli nezávislí hodnotitelé schopni k sobě správně přiřadit častěji fotografie partnerů, které byly vyfotografovány v době jejich 25. výročí než během jejich líbánek. Většina dosavadních studií ovšem spíše naznačuje, že v případě homogamie se mechanismus konvergence příliš neuplatňuje. Jak se ukázalo, délka vztahu má na míru podobnosti partnerů v osobnostních charakteristikách, postojích, hodnotách apod. zanedbatelný vliv (Buss, 1984; Feng & Baker, 1994; Glicksohn & Golan, 2001; Watson et al., 2004). Jiná studie ukázala, že vztahy trvající méně než 6 měsíců vykazují srovnatelnou míru homogamie jako dlouhodobé páry (Luo, 2009).

Jako stěžejní se jeví „plasticita“ charakteristik (např. konzumace alkoholu je plastičtější než barva očí; Mascie-Taylor, 1989). Konvergence napříč různými fyzickými, sociálními a behaviorálními charakteristikami nebyla nalezeny u 36 ze 44 zkoumaných charakteristik (Price & Vandenberg, 1980). A právě charakteristiky, u nichž nalezena byla, byly ty vysoce plastické. Autoři uvádějí, že ke konvergenci může tedy docházet nejsnadněji u chování a návyků (kouření, konzumace alkoholu, sociální aktivity; Price & Vandenberg, 1980). To potvrzují i další studie, které ukázaly, že ke konvergenci mezi partnery dochází např. v chování, životním stylu, či neverbální komunikaci (Griffiths & Kunz, 1973; Tambs, Moum, Council, & Relations, 1992; Zajonc et al., 1987). Naopak u charakteristik, v nichž je intraindividuální variabilita v průběhu ontogeneze nízká (např. osobnostní charakteristiky), významnou konvergenci partnerů očekávat nelze (Cobb-Clark & Schurer, 2012; Costa & McCrae, 1994).

Párují se lidé na základě soběpodobnosti, nebo homogamie vzniká důsledkem soužití? Mechanismus preferencí pro soběpodobnost a konvergence lze rozlišit prostřednictvím longitudinálních studií. A právě longitudinální studie homogamie manželských párů ukázaly, že míra podobnosti v postojích a osobnostních charakteristikách se v průběhu 20 let nezměnila (Caspi & Herbener, 1993). Jiná studie navíc ukázala, že partneři se vzájemně podobali v osobnostních charakteristikách a zájmech ještě před tím, než se potkali (Gonzaga et al., 2010). Další studie ukázala, že manželé si byli podobní v atraktivitě, politických názorech a náboženském vyznání stejně jako partneři, kteří spolu chodili nejméně 11 měsíců (Bleske-Rechek, Remiker, & Baker, 2009). Studie zaměřená na podobnost ve fyzických charakteristikách zjistila, že podobnost manželů je důsledkem spíše samotného výběru než postupného připodobňování (Pennock-Roman, 1984).

Jak uvádí Caspi a kol. (1992), soužití a společné zážitky tak mohou partnerskou podobnost spíše udržovat než zvyšovat. Na jedné straně přílišná odlišnost partnerů může být nepříjemná a stresující, pročež mohou vzájemnou rozdílnost balancovat či snižovat, aby se tomuto diskomfortu vyhnuli. Na druhou stranu, pokud by konvergence fungovala intenzivně a kontinuálně po celou dobu trvání vztahu, mohla by být pro vztah spíše nevýhodná, jelikož by partneři snížili variabilitu svých vlastností (tzv. model švýcarského nože), a mohli tak hůře vzájemně kompenzovat své nedostatky (Levinger, 1964; Winch, 1967).

Partneři, kteří si jsou méně podobní a mají méně společného, se mohou častěji rozcházet (Bacon et al., 2014). To potvrdily i nedávné longitudinální studie (Schwartz, 2010b, 2010a), které ukázaly, že sezdané a nesezdané páry se lišily v homogamii ve vzdělání (sezdaní vykazovali vyšší míru soběpodobnosti), avšak v době seznámení se nelišily. Je tedy možné, že mezi páry, které jsou spolu dlouho, se nemusí homogamie nutně zvyšovat, ale že spolu zůstaly právě proto, že si partneři byli podobní a současně se nezačali lišit. Naopak páry, jejichž homogamie se v průběhu času snižuje, se mohou častěji rozpadat. Z tohoto důvodu jsou pro testování konvergence vhodnější longitudinální než průřezové studie.

Zatímco první tři mechanismy (preference pro homogamii, důsledek fungování „partnerského trhu“ a proximita) mohou mít za následek, že se vzájemně podobní jedincí spárují, konvergence může tuto podobnost udržovat (Luo, 2017). Jinými slovy v homogamii partnerů nemusí hrát roli exkluzivně pouze jeden mechanismus, ale jednotlivé mechanismy se mohou vzájemně doplňovat. Budoucí výzkumy by se tak mohly zaměřit na otázku, v jakých charakteristikách a v jakých fázích vztahu hrají jednotlivé mechanismy klíčovou roli, a v neposlední řadě jaké jsou mezi jednotlivými mechanismy vzájemné interakce.

1.1.4. Důsledky homogamie

1.1.4.1. Vztahové důsledky homogamie

Většina studií ukazuje, že soběpodobní partneři vykazují větší partnerskou spokojenost než nepodobní partneři. Ačkoli ne všechny studie pozitivní efekt homogamie na partnerskou spokojenost nalezly (např. Dyrenforth, Kashy, Donnellan, & Lucas, 2010), jen velice málo jich zjistilo pozitivní vztah mezi heterogamií a spokojeností (např. Dryer & Horowitz, 1997). George a kolegové (2015) zjistili, že soběpodobnost partnerů nepřispívá partnerské spokojenosti, nicméně jejich odlišnost signifikantně predikuje nespokojenost v manželství. U párů, které navštěvovaly partnerské poradenství, byla nalezena nižší homogamie v osobnostních charakteristikách než u těch, které na poradenství nedocházely (Han et al., 2003). Heterogamní vztahy mají navíc vyšší pravděpodobnost rozpadu než vztahy založené na homogamii (Hill, Rubin, & Peplau, 1976; Oppenheimer, 1988; Sanchez, Manning, & Smock,

1998). I přes částečnou nekonzistenci výsledků napříč studiemi nalezla většina studií pozitivní efekt homogamie na partnerskou spokojenost (Arrindell & Luteijn, 2000; Bereczkei & Csanaky, 1996; Burleson & Denton, 1992; Byrne, 1971), a to nejen u heterosexuálních, ale i homosexuálních jedinců (Bártová et al., 2017)

Na proximátní rovině může vzájemná podobnost zvyšovat pocit porozumění, sounáležitosti apod., což napomáhá budování intimity ve vztahu. Lidé s podobnými charakteristikami taktéž mají tendence vnímat svět podobným způsobem, reagovat na určité situace stejným stylem atd., což může usnadňovat komunikaci a každodenní interakce a snižovat počet konfliktů (Rusbult, Finkel, & Kumashiro, 2009). Pro homogamní partnery může být taktéž snadnější interpretovat a pochopit myšlenky a pocity svého partnera, což přispívá vzájemné empatii a pochopení. Podobnost partnerů může taktéž vést k více společným zájmům a možnostem společného trávení času. Acitelli a kolegové (2001) zjistili, že partneři s podobnými hodnotami vykazují vyšší partnerskou spokojenost než ti, kteří mají hodnoty odlišné. Pozitivním aspektem homogamie tak může být taktéž sebepotvrzování, jelikož stejné názory a hodnoty druhé osoby mohou být vnímány jako „potvrzení správnosti“ těch vlastních. Hill a kolegové (1976) navíc dospěli k závěru, že vyšší partnerská spokojenost může vést k větší reprodukci bez přítomnosti jakýchkoli biologických faktorů zvyšujících plodnost. Z evoluční perspektivy může být homogamie pro vztah přínosná, jelikož prizmatem teorie příbuzenského výběru zvyšuje altruismus mezi partnery (Hamilton, 1964).

Intuitivně bychom mohli očekávat vyšší míru homogamie v těch charakteristikách, jejichž podobnost může vztahu přinášet nějaké výhody (např. může zvyšovat partnerskou spokojenost či stabilitu vztahu). Nicméně zdaleka ne u všech charakteristik je vliv na spokojenost a stabilitu vztahu známý.

Homogamie v demografických charakteristikách je spíše slabým, ač signifikantním prediktorem partnerské spokojenosti (Gaunt, 2006; Keizer & Komter, 2015; Leikas, Ilmarinen, Verkasalo, Vartiainen, & Lönnqvist, 2018; Schoen, Rogers, & Amato, 2006).

V případě osobnostních charakteristik má homogamie na partnerskou spokojenost slabý pozitivní efekt (Caspi & Herbener, 1990; Luo & Klohnen, 2005; Shiota & Levenson, 2007; Wilson & Cousins, 2003), nicméně tento efekt zmizí, když je celý model kontrolován pro individuální charakteristiky obou partnerů (Luo, 2009; Watson et al., 2004). Jako klíčové se

tedy jeví charakteristiky partnerů, a nikoli jejich vzájemná podobnost (např. jedinci s vysokým skórem neuroticismus vykazují nižší partnerskou spokojenost než méně neurotičtí jedinci, přičemž míra podobnosti s partnerem nehraje významnou roli; Dyrenforth et al., 2010). Naopak v případě sociálních schopností se ukázala jako klíčová podobnost partnerů, která pozitivně predikovala spokojenost (a to i v případě, kdy oba partneři vykazovali nízké sociální schopnosti; Burleson & Denton, 1992). Výzkumy tak naznačují, že v některých charakteristikách může být pro partnerskou spokojenost důležitější vzájemná podobnost partnerů, zatímco v jiných charakteristiky jednotlivých partnerů.

Homogamie ovšem může mít na vztah i negativní dopady, a to zejména v případě problematického chování, jako je např. alkoholismus či antisociální chování (Rhule-Louie & McMahon, 2007). Soběpodobnost partnerů v takovém případě snižuje šanci na změnu, když se jeden z partnerů dostane do problémů (Caspi & Herbener, 1990), partneři se navíc mohou v daném chování vzájemně podporovat, což může komplikovat možnost nápravy.

Jak naznačují uvedené výzkumy, homogamie má na vztah spíše pozitivní dopad, ačkoli dosud není zřejmé, jaké konkrétní dopady na spokojenost mají různé charakteristiky a zejména soběpodobnost v nich. Budoucí výzkumy by se taktéž měly zaměřit na neheterosexuální jedince (Bártová et al., 2017) a nezápadní populace (Lucas et al., 2004).

1.1.4.2. Genetické důsledky homogamie

Prostřednictvím homogamie může docházet k tzv. optimálnímu outbreedingu (Bateson, 1983). Výběrem soběpodobného partnera se totiž zvyšuje pravděpodobnost inbreedingu, tedy křížení mezi geneticky příbuznými jedinci, obvykle definovanými jako bratranci/sestřenice z prvního kolena či bližší (Thornhill, 1991). Následkem inbreedingu může docházet k homozygotismu u potomků, což zvyšuje pravděpodobnost hromadění letálních alel, které s sebou nesou riziko snížení životaschopnosti potomků a výskytu vývojových vad či fyzických defektů (Blouin & Blouin, 1988; Seemanová, 1971). Naopak outbreeding (křížení mezi geneticky vzdálenými jedinci) může mít za následek rozpad lokálně uzpůsobených adaptací a genových komplexů. U heterozygotů je vyšší pravděpodobnost, že ponesou vzácnější alely, a tudíž budou geneticky rezistentní vůči patogenům (Thornhill & Gangestad, 1996). Ke zvýšení heterozygotnosti u

potomků by mohlo vést negativní asortativní párování (heterogamie, komplementarita). Optimální párovací strategií se tak jeví spárování s jedincem, který je podobný, ale ne příliš, tzv. optimální outbreeding (Bateson, 1983; Epstein & Guttman, 1984).

Za předpokladu, že je genotyp reflektován ve fenotypu, vyšší míra homogamie zvyšuje pravděpodobnost předání více vlastních (resp. společných) genů do další generace (Sweeney & Cancian, 2004). Vzájemná podobnost vede k vyššímu altruismu (Hamilton, 1964), což může zvyšovat inkluzivní i exkluzivní fitness jedince. Výzkum genetické podobnosti párů ukázal, že partneři si jsou podobnější než náhodně spárovaní jedinci (Domingue, Fletcher, Conley, & Boardman, 2014). Rushton a Bons (2005) navíc dospěli k závěru, že partnerská homogamie je vyšší u těch znaků, které jsou více dědivé (např. výška versus zaměstnání). Nicméně samotná dědičnost nemůže vysvětlit hierarchii jednotlivých charakteristik v kontextu homogamie. Jinými slovy, nejvyšší homogamie je systematicky nacházena u socio-demografických charakteristik, které přímo dědičné nejsou, ačkoli mohou být vedlejším efektem jiných děděných charakteristik, a současně mohou být předávány nebiologickou cestou, např. učením. Naopak dědivá komponenta fyzických charakteristik je vyšší, ovšem homogamie v nich je tradičně významně nižší než v případě socio-demografických charakteristik.

Životní strategie (life history) závisí na podmínkách prostředí. V případě nepříznivých podmínek je výhodnější rychlá životní strategie (dřívější zahájení reprodukce, více potomků apod.), zatímco v případě příznivých podmínek je výhodnější pomalá životní strategie (pozdější reprodukce, méně potomků, vyšší investice do potomků apod.; Figueredo & Wolf, 2009). V kontextu nenáhodného párování může být jako rychlá životní strategie nahlížena heterogamie, jelikož produkuje geneticky variabilnější potomstvo, které může mít vyšší šanci na přežití v nepříznivých a hůře predikovatelných podmínkách. Oproti tomu homogamie může být adaptivní ve stálých a predikovatelných podmínkách, jelikož potomstvo homogamních rodičů je na tyto podmínky adaptované (Figueredo & Wolf, 2009).

Na populační úrovni může nenáhodné párování ovlivňovat variabilitu znaků (zejména těch s dědičnou komponentou) v populaci. Např. simulační studie efektu nenáhodného párování na obezitu v populaci ukázala, že změna párování z náhodného na nenáhodné může výskyt obézních jedinců v populaci až zdvojnásobit během pouhých dvou generací (Speakman et al., 2007). Nenáhodné párování může také ovlivnit genetickou strukturu populace prostřednictvím

zvýšeného genetické variance a výskytu homozygotnosti (Crow & Felsenstein, 1968). Asortativní párování může taktéž vést k sympatrické speciaci tím, že rozdělí jednu populaci na dvě (Doebeli, 1996; Jiang, Bolnick, & Kirkpatrick, 2013; Udovic, 1980).

1.1.5. Metodická úskalí výzkumu homogamie

Dosavadní výzkum naznačuje, že partneři se vzájemně podobají v mnoha různých charakteristikách s vyšší pravděpodobností než náhodně spárovaní jedinci. Ačkoli by se mohlo jevit, že dlouhodobý výzkum nenáhodného párování všechny otázky již zodpověděl, není tomu tak. V první řadě je důležité si uvědomit, že ne všechny studie homogamii mezi partnery potvrdily. Ačkoli některé studie podobnost nalezly, jiné ji nenalezly, a některé dokonce zjistily, že jsou partneři signifikantně odlišní. Nekonzistence výsledků může být způsobena několika faktory.

Zaprvé, studie jsou prováděny na různých místech a v různém čase. Ačkoli např. homogamie partnerů ve věku je v čase i z geografického hlediska poměrně stabilní, homogamie ve vzdělání roste společně s přístupem žen ke vzdělání. Soběpodobnost partnerů v různých charakteristikách může současně odrážet důležitost jednotlivých charakteristik v dané společnosti, což ilustruje např. pokles homogamie v náboženském vyznání v USA v průběhu 20. století (Kalmijn, 1991).

Zadruhé, závěry jednotlivých studií nejsou snadno srovnatelné, jelikož výzkumné vzorky daných studií tvoří páry s různou mírou závazku a s různou délkou trvání. V případě testování preferencí pro homogamii je tato námitka irelevantní, ovšem v případě testování podobnosti skutečných párů musí být brána v potaz. Dochází-li např. ke zvyšování partnerské podobnosti v průběhu soužití, je porovnávání míry homogamie u randících a dlouhodobě sezdaných párů přinejmenším problematické. Navíc vzhledem k vztahu mezi homogamií a partnerskou spokojeností a stabilitou je nezbytné závazek a délku vztahu kontrolovat. Např. vztahy, které nejsou založeny na homogamii, se mohou častěji rozpadat, což znamená, že ačkoli v počátečních fázích vztahu nemusíme vzorec homogamního párování nalézt, u dlouhodobějších vztahů již může být patrný, jelikož nehomogamní vztahy se rozpadnou.

Zatřetí, partnerská podobnost může být buď vnímaná (když jeden partner hodnotí charakteristiky obou partnerů), nebo objektivní (když každý partner hodnotí své vlastní charakteristiky). Jelikož se partneři mají tendenci vnímat jako vzájemně podobnější, objektivní a vnímaná podobnost partnerů se může do určité lišit, což může vést k rozdílným se výsledkům jednotlivých studií (Trost, 1967).

V neposlední řadě se výsledky jednotlivých studií mohou lišit podle způsobu výpočtu partnerské podobnosti. Existují tři základní postupy. Zaprvé, skór diskrepance, kdy se vypočítá absolutní rozdíl v určité charakteristice mezi oběma partnery (např. partner má skór extraverze 5 a partnerka 7, tudíž jejich skór diskrepance je 2). Nižší hodnota tak značí vyšší míru podobnosti. Nevýhodou tohoto přístupu je nejednoznačnost, od jaké hodnoty přestávají být partneři podobní a začínají být nepodobní. Zadruhé, korelace charakteristik (*variable-centered correlation*), kdy se napříč celým vzorkem koreluje jedna konkrétní charakteristika (např. extraverze). Čím vyšší korelační koeficient, tím vyšší podobnost. Nevýhodou ovšem je, že korelace ukazuje podobnost napříč celým vzorkem, a nikoli podobnost jednotlivého páru, a současně lze najednou testovat homogamii pouze v jedné charakteristice. Zatřetí, korelace páru (*couple-centered correlation*), kdy se prostřednictvím korelace několika charakteristik partnerů získá index podobnosti jednotlivých párů. Nevýhodou tohoto přístupu je, že nelze provádět korelaci charakteristik měřených pouze jednou položkou (např. výška). Naopak výhodou je možnost korelovat jak jednu charakteristiku (např. extraverzi měřenou více otázkami), tak např. celý osobnostní profil.

Valná většina výše uvedených studií je postavena na korelačních analýzách, nicméně je důležité si uvědomit, že některé charakteristiky jsou navzájem silně spjaty (např. věk a fyzická zdatnost/zdraví, vzdělání a socioekonomický status apod.). Tudíž je možné, že homogamie (ne)nalezená v určitých charakteristikách je pouze vedlejším efektem homogamie v charakteristikách jiných. Proto je žádoucí, aby budoucí studie vždy kontrolovaly efekt ostatních relevantních charakteristik.

2. Cíle práce

Předložená práce měla dva hlavní cíle. Zaprvé, kriticky shrnout současný stav poznání v oblasti nenáhodného párování, zadruhé, testovat míru nenáhodného párování v závislosti na pohlaví, sexuální orientaci a populaci respondentů se zaměřením na preference i reálný výběr. V neposlední řadě jsme testovali další mechanismus (imprinting-like efekt), prostřednictvím něhož může docházet k podobnosti partnerů. Primární důraz byl kladen na homogamii v osobnostních a fyzických charakteristikách.

Cíle přiložených prací:

I. **Štěrbová, Z.**, & Valentová, J. (2012). Influence of homogamy, complementarity, and sexual imprinting on mate choice. Anthropologie (1962-), 50(1), 47-60.

$Cíl_I$: Kriticky shrnout poznání v oblasti pozitivního (homogamie, imprinting) a negativního (heterogamie, komplementarita) nenáhodného párování. Dalším cílem bylo pojednat mechanismy vzniku podobnosti/nepodobnosti partnerů, evoluční důsledky homogamie a heterogamie a jejich dopad na partnerskou spokojenost. Práce vychází především z paradigmatu evoluční a sociální psychologie.

II. **Štěrbová, Z.**, & Havlíček, J. (2017): Sexuální imprinting v komparativní perspektivě v Člověk a jeho mozek, mysl a její nemoc, Ed. Horáček, J., Höschl, C., Kesner, L., & Španiel, F. Galén. ISBN 978-80-7492-283-1

$Cíl_{II}$: V komparativní perspektivě představit dosavadní poznání v oblasti imprintingu. Nejdříve je pojednán imprinting rodičovský a následně sexuální. U sexuálního imprintingu jsou představeny jeho podmínky (senzitivní perioda, nezvratitelnost, prodleva mezi vtištěním a spuštěním daného chování). Jelikož u člověka podmínky naplněny nejsou, výzkumníci referují o imprinitng-like efektu, který je pozitivní nebo negativní.

III. **Štěrbová, Z.**, Bártová, K., Nováková, L. M., Varella, M. A. C., Havlíček, J., & Valentova, J. V. (2017). Assortative mating in personality among heterosexual and male homosexual couples from Brazil and the Czech Republic. Personality and Individual Differences, 112, 90-96.

$Cíl_{III}$: Testovat preferovanou a vnímanou/skutečnou homogamii v osobnostních charakteristikách u heterosexuálních a homosexuálních mužů z Brazílie a České republiky.

IV. Bártová, K., **Štěrbová, Z.**, Nováková, L. M., Binter, J., Varella, M. A. C., & Valentova, J. V. (2017). Homogamy in Masculinity–Femininity Is Positively Linked to Relationship Quality in Gay Male Couples from the Czech Republic. Archives of sexual behavior, 46(5), 1349-1359.

$Cíl_{IV}$: Testovat míru podobnosti v maskulinitě-femininitě u dlouhodobých homosexuálních partnerů a její vliv na kvalitu partnerského vztahu.

V. Valentova, J. V., Bártová, K., **Štěrbová, Z.**, & Varella, M. A. C. (2016). Preferred and actual relative height are related to sex, sexual orientation, and dominance: Evidence from Brazil and the Czech Republic. Personality and Individual Differences, 100, 145-150.

$Cíl_{V}$: Testovat relativní výšku u ideálních a skutečných partnerů a její souvislost se submisivitou a dominancí v partnerském vztahu. Studie se zúčastnili heterosexuální a neheterosexuální ženy a muži z Brazílie a České republiky.

VI. Valentova, J. V., Varella, M. A. C., Bártová, K., **Štěrbová, Z.**, & Dixson, B. J. W. (2017). Mate preferences and choices for facial and body hair in heterosexual women and homosexual men: influence of sex, population, homogamy, and imprinting-like effect. Evolution and Human Behavior, 38(2), 241-248.

$Cíl_{VI}$: Testovat vliv homogamie a imprinting-like efektu na preferovanou a skutečnou míru tělesného ochlupení a délky vousů u homosexuálních mužů a heterosexuálních žen z Brazílie a České republiky.

VII. Valentova, J. V., Bártová, K., **Štěrbová, Z.**, & Varella, M. A. C. (2017). Influence of sexual orientation, population, homogamy, and imprinting-like effect on preferences and choices for female buttock size, breast size and shape, and WHR. Personality and Individual Differences, 104, 313-319.

Cíl$_{VII}$: Testovat vliv homogamie a imprinting-like efektu na preferovanou a skutečnou velikost hýždí a poprsí, na tvar poprsí a poměr pasu a boků u heterosexuálních mužů a neheterosexuálních žen z Brazílie a České republiky.

3. Závěr

Homogamie získala a stále získává významnou empirickou podporu, přičemž pouze minimum studií nalezlo mezi partnery signifikantní heterogamii/komplementaritu. Závěry studií tak podporují buď pozitivní nenáhodné párování (homogamii) nebo náhodné párování. Nejsilnější homogamie je systematicky nacházena v případě sociálně-demografických charakteristik, u postojů, hodnot a dalších psychologických charakteristik je obvykle nacházena podobnost partnerů středně silná, zatímco u osobnostních a fyzických charakteristiky spíše slabá (Luo, 2017; Rushton & Bons, 2005).

Výzkum nenáhodného párování probíhá již od začátku minulého století a postupně pronikl do mnoha různých oborů a vědeckých disciplín. Otázka homogamie je tak studována z různých hledisek, pomocí různých metodik a přístupů, se zaměřením na různé charakteristiky, přičemž jednotlivé poznatky se vzájemně doplňují, čím vytvářejí komplexní, ač stále nekompletní obraz. Například sociální psychologové a demografové se zaměřují na výzkum mnohdy postavený na reprezentativních vzorcích popisující trendy v párování závislé na okolních skutečnostech, jako je např. postavení žen ve společnosti, důležitost náboženství v dané společnosti apod. Na druhé straně psychiatři se zaměřují na velice specifický vzorek populace, přičemž testují nejen výskyt homogamie, ale taktéž mechanismy jejího vzniku. Dosud ovšem stále není známo, nakolik je princip homogamie generalizovatelný a nakolik je závislý na pohlaví, orientaci a kultuře.

Otázkou taktéž zůstává, proč se princip homogamie při párování neprojevuje silněji a univerzálněji, ukazuje-li se jako prospěšný na vztahové i genetické rovině. Jedním z možných vysvětlení je diskrepance mezi preferencemi a skutečným výběrem. Jinými slovy, ačkoli lidé vykazují pro soběpodobnost silné preference, ve skutečném výběru se homogamie projevuje méně (Figueredo et al., 2006; Štěrbová et al., 2017), např. proto, že lidé při skutečném výběru dělají celou řadu kompromisů. Jak již bylo řečeno výše, příliš velká vzájemná podobnost by s sebou mohla nést rizika spojená s inbreedingem. Z tohoto hlediska může být přínosnější najít si partnera, který je podobný, ale ne příliš (tzv. optimální outbreeding) (Bateson, 1983). Ačkoli homogamie přináší vztahu celou řadu výhod, prospěšná může být i heterogamie, jelikož tak každý z partnerů může přispívat něčím jiným, a tím prospívat samotnému vztahu (Dryer & Horowitz, 1997). V neposlední řadě se homogamie nemusí projevovat ve všech

charakteristikách do stejné míry a stejným způsobem, pročež by bylo pro budoucí výzkum přínosné zaměření nikoli na izolované charakteristiky, ale na jejich širší spektrum.

V přiložených publikacích je kriticky shrnut současný stav poznání nenáhodného párování (homogamie, heterogamie, komplementarita, imprinting-like efekt) a představen výzkum, který pojednává ideální i skutečnou homogamii v osobnostních (Big Five, genderová nonkonformita) a fyzických charakteristikách (tělesná výška, míra tělesného ochlupení, délka vousů, velikost a tvar prsou, poměr pasu a boků, velikost pozadí) u heterosexuálních i neheterosexuálních jedinců pocházejících ze dvou různých populací (Brazílie a Česká republice). Závěry ukazují, že princip homogamie se uplatňuje u heterosexuálních i homosexuálních jedinců z obou zkoumaných populací, což naznačuje, že homogamie by mohla být univerzální párovací strategií. Výsledky studií významně přispívají k pochopení interindividuální variability nenáhodného párování.

Pochopení, jak výběr partnera probíhá a jaké okolnosti vedou k podobnosti partnerů, je velice důležité. Dosavadní výzkum naznačuje, že nejvýznamnější roli hrají preference pro soběpodobnost, následovány vlivy „partnerského trhu“, proximitou a konvergencí. Nicméně vztah mezi nimi stále není zcela jasně definován. Porozumění mechanismům párování by bylo přínosné také pro klinickou praxi, např. partnerskou terapii. Poznatky z oblasti nenáhodného párování jsou potenciálně aplikovatelné také v oblasti seznamování (seznamky), problémů s reprodukcí (reprodukční kliniky) či transgeneračního přenosu psychopatologií (psychiatrie).

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Příloha I

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ZUZANA ŠTĚRBOVÁ, JAROSLAVA VALENTOVÁ

INFLUENCE OF HOMOGAMY, COMPLEMENTARITY, AND SEXUAL IMPRINTING ON MATE CHOICE

ABSTRACT: There are two basic theories explaining possible principles on which people are attracted to each other and how individuals create sexual and romantic relationships. The theory of homogamy states that in their potential or actual partners individuals prefer characteristics that are similar to themselves ("birds of a feather flock together"). One of the mechanisms that can cause homogamy in partners might be sexual imprinting. According to this theory, individuals prefer in potential partners traits that are similar to those of the opposite sex parent. In contrast, the theory of complementarity suggests that individuals are attracted to partners with traits that are opposite to their own ("opposites attract"). From an evolutionary perspective, homogamous preferences can be explained by the theory of kin selection and outbreeding depression avoidance, while pairing on the principle of complementarity is advantageous in terms of inbreeding avoidance. We will critically review these two theories – including their implications and empirical support – from the perspective of evolutionary psychology and human ethology. We will argue that principles of homogamy and complementarity are not necessarily mutually exclusive but, rather, are complementary.

KEY WORDS: Homogamy – Complementarity – Sexual imprinting – Mate choice – Sexual selection – Assortative mating – Evolved mating preferences – Evolutionary perspective – Phenotype matching – Freud – Westermarck effect – Inbreeding avoidance – Incest avoidance

INTRODUCTION

A body of recent research has repeatedly shown that human mate choice is far from random for most traits. Assortative mating can be positive – people are coupled with individuals having characteristics like their own (principle of homogamy), or negative – people are coupled with individuals having less similar or opposite characteristics than they have (principle of complementarity) (Alvarez, Jaffe 2004). Within the framework of the principle of homogamy it has been postulated that sexual imprinting plays an important role

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in mate preferences and actual mate choice (Bereczkei *et al.* 2004). In this paper, we will use an evolutionary perspective to discuss current research based on these two principles. The main aim of this article is to contrive that both principles are very closely interconnected and may complement each other, although it could seem that they are mutually exclusive. Furthermore, we implicate suggestions for further research.

POSITIVE ASSORTATIVE MATING, OR HOMOGAMY

The principle of homogamy is based on the suggestion that people couple with partners who match their basic personality and phenotypic traits. Homogamy in partners can arise as a result of several mechanisms.

Causes of homogamy

First, partners can resemble each other as a result of proximity effect. Kalmijn and Flap (2001) have investigated five meeting settings (work, school, neighborhood, common family networks, and voluntary associations) and subsequently in each context analyzed homogamy in five types of traits: age, education, class destinations, class origins, and religious background. Homogamy in the majority of these traits was positively associated with school setting. Moreover, workplace setting has been linked to homogamy in class destinations, neighborhoods, and common family networks to religious homogamy. These results have suggested that different kinds of meeting settings that arise from proximity can produce homogamy.

Secondly, homogamy in partners can ensue as a consequence of preference for self-similarity. It has been for instance reported that self-similar faces are judged as more attractive than faces with self-dissimilar features (e.g., Nojo *et al.* 2012). Preferences for self-similarity in the opposite-sex can be considered as a subset of the mechanism of sexual imprinting (see below).

Thirdly, homogamy can be a side-product of competition for desired partners, which has been supported by recent studies aimed at mate value (Brase, Guy 2004, Miner *et al.* 2009). Regan (1998) has suggested that individuals are willing to make compromises between ideal and actual partners based on mate value. For example, partners may be similarly attractive, not on the basis of their own preference and choice, but rather because partner choice is countered by competition. Thus, individuals must compromise their demands based on their own mate value.

Fourth, homogamy among partners can be due to the convergence (partners became more similar over time). Thus, the effect of homogamy in long-term relationships raises question, whether the individuals are mating on the basis of self-similarity, or they begin to resemble each other under the influence of cohabitation (Griffiths, Kunz 1973, Hinsz 1989, Zajonc *et al.* 1987). A longitudinal study has found that the level of similarity in personality characteristics among partners does not change between the first and the twentieth year of marriage (Caspi *et al.* 1992 in Bleske-Rechek *et al.* 2009). Bleske-Rechek *et al.* (2009) supported these results by showing that like married couples, even unmarried couples that dated at least 11 months were alike in self-assessed as well as in attributed attractiveness and opinions on politics and religion. Similarly, according to research on partner resemblance in physical characteristics, in the first six months of marriage the physical resemblance in couples results from initial partner choice rather than gradual mutual assimilation (Pennock-Roman 1984). Thus, there is rather weak, if any evidence for convergence in homogamy among partners (McCrae *et al.* 2008, Watson *et al.* 2004, Zietsch *et al.* 2011).

Homogamy in socio-demographic, psychological, and physical characteristics

Results of numerous studies have shown that in number of characteristics romantic couples display higher similarity than randomly paired individuals. Positive correlations among partners have been found in socio-demographic characteristics, such as family background, courtship behavior, social participation, religious affiliation and behavior, conceptions of marriage (Burgess, Wallin 1943), age (e.g., Bereczkei, Csanaky 1996, Esteve *et al.* 2009, Jaffe, Chacon-Puignau 1995, Mascie-Taylor 1987, Watson *et al.* 2004), education (Bereczkei, Csanaky 1996, Jaffe, Chacon-Puignau 1995, Mascie-Taylor 1987, Stevens 1991, Watson *et al.* 2004), political orientation (Watson *et al.* 2004), religiousness (Kalmijn 1991, Ortega *et al.* 1988, Watson *et al.* 2004), social status (Jaffe, Chacon-Puignau 1995, Kalmijn 1998, Mascie-Taylor 1987), ethnicity (Freeman 1955), nationality (Jaffe, Chacon-Puignau 1995), and geographical locality (Mascie-Taylor 1987).

Homogamy in partners was also found in some personality characteristics (e.g., Byrne *et al.* 1967, Keller *et al.* 1996), attachment (Watson *et al.* 2004), in Big Five personality domains, in particular, extraversion, conscientiousness, and openness (Gyuris *et al.* 2010), openness and agreeableness (McCrae *et al.* 2008), in Eysenckian Big Three and Sensation seeking (Glicksohn,

Golan 2001), in broad interests, insecurity, self-discipline, quietness, and ruthlessness (Little *et al.* 2006), and cognitive abilities and intelligence (Ahern *et al.* 1985, Glicksohn, Golan 2001, Jones 1929, Watson *et al.* 2004). Interestingly, homogamy was also found for alcoholism (Jacob, Bremer 1986) and some other psychiatric disorders, e.g., generalized anxiety disorder, major depressive disorder, panic disorder, and phobias (Maes *et al.* 1998, McLeod 1995, Merikangas 1982).

It has been reported that partners resemble one another in physical appearance (Chambers *et al.* 1983, Keller *et al.* 1996, Spuhler 1968), e.g., in facial traits (Bovet *et al.* 2012), eye color (Laeng *et al.* 2006, Pennock-Roman 1984), facial symmetry (Burriss *et al.* 2011), relative body weight (Allison *et al.* 1996, Mascie-Taylor 1987), body shape (Courtiol *et al.* 2010), obesity (Speakman *et al.* 2007), body height (Pawłowski 2003, Seki *et al.* 2012), and perceived attractiveness (Little *et al.* 2006).

A variety of research methods have identified similarities between partners, e.g., perceived resemblance (i.e., through judgments of mutual similarity by independent raters) and measured resemblance (i.e., similarity computed from facial, bodily or personality measurements) (Nojo *et al.* 2012). Preferences for self-similar traits in many characteristics (e.g., same-race preference) in potential partners also emerged in real-life data, such as online dating service (Hitsch *et al.* 2010).

It seems that tendencies for homogamy in some traits can fluctuate over time. A set of the United States national surveys completed between 1955 and 1989 aimed at religious and educational homogamy in married couples has shown that intermarriage between protestants and catholics has increased, while intermarriage between partners with different levels of education has decreased (Kalmijn 1991). Another study has shown an increase of the importance of economic prospects for assortative mating over time (Sweeney, Cancian 2004). This research illustrates the fact that homogamy in various traits can, at least to some degree, fluctuate over time.

Homogamy and relationship satisfaction

Similarity among partners can also influence relationship satisfaction – for example, partners more similar to each other (e.g., in age, educational level, self-rated health, and self-rated overall marriage quality) stay together longer, are happier in marriage and relationship and have more children than couples who are less similar (Arrindell, Luteijn 2000, Bereczkei, Csanaky 1996). In general, greater similarity in personality characteristics, beliefs, religion, opinions, attitudes, values, and general world view decreases conflicts and quarrels between partners, which contributes to a more satisfying relationship (Buunk, Bosman 1986, Byrne 1971 in Klohnen, Luo 2003, Ortega *et al.* 1988). Although more cross-cultural research in this area is needed, so far the link between marital satisfaction and homogamy has been reported in the US, Great Britain, China, and Turkey (Lucas *et al.* 2004).

These findings can be partly interpreted from the perspective of equity theory stating that equal inputs and outputs of the partners in the relationship predict relationship satisfaction. According to the equity theory, underbenefited individuals show lower satisfaction than overbenefited ones (Hatfield, Rapson 1993). Similarity in personality characteristics might thus be considered as a desire for partners' equality, which increases relationship satisfaction.

Homogamy in the evolutionary perspective

From the ultimate evolutionary perspective the preference for self-similarity can be interpreted as an adaptive mechanism. In particular, preference for homogamy can be framed by kin selection theory (Trivers 1971). According to kin selection theory, higher degree of mutual similarity among partners leads to higher degree of altruism, because similar partners share more common genes. Thus, mating with genetically similar (but not close relative) partner can increase probability to transfer own genes to next generations (Sweeney, Cancian 2004).

A specific issue is the proximate mechanism of kin recognition, respectively genetically close or related individuals. Detection of genetically similar individuals is possibly based on a mechanism called "phenotype matching", which assumes that genotype is reflected in phenotype (external genes' manifestations). According to this theory, individuals apply their innate algorithm of their own phenotype as a template to an unknown person and then prefer those whose features are similar to their own. Based on the perspective of the phenotype matching theory, people can, for instance, choose romantic partners with similar phenotypic traits, which also means that partners share more common genes. Thus, parents and offspring share more genes, which increases representation of their own genes in future generations (Rushton 1988). This algorithm might be formed on the basis of appearance, odors or other phenotypic traits of other individuals (Blaustein *et al.* 1991). In humans there is some evidence that individuals

are able to recognize the smell of their children or siblings (Lucas *et al.* 2004). Other study has suggested, that humans are able to recognize their close relatives through olfactory cues (Porter 1987). As Lieberman *et al.* (2007) have proposed, the kin detection system is based in particular on association of the other individual with the same biological mother, and also on the length of coresidence with her. Thus, mutual altruism might be increased also in self-similar individuals, who are not genetically related.

In contrast, extreme homogamy might have a negative impact in the sense of inbreeding. Inbreeding is defined as mating among individuals related by common ancestry (it usually describes mating between first cousins or closer) (Thornhill 1991). It can result in increased homozygosity (two identical forms of a particular allele, one inherited from each parent) in offspring, which can increase the risk of expression of recessive deleterious alleles (Blouin, Blouin 1988). Thus, optimal mating seems to follow homogamous pattern, but not extreme self-similarity or familiarity pattern. One of the adaptations to avoid inbreeding could be mating on basis of negative assortative mating, i.e., complementarity (see below).

SEXUAL IMPRINTING

As shown in the preceding section, individuals couple with (and in some cases also prefer) partners with basic personality and phenotypic traits that are similar to themselves, which means also similar to their parents. As reported by Rushton (1988), sexually interacting couples share 50% of measured genetic markers, mothers and their offspring share 73% and randomly paired individuals from the same sample share 43% genes. In line with this, it has been reported that in partners individuals prefer characteristics that their parents have. This mechanism is known as sexual imprinting (for review, see, e.g., Bereczkei, Gyuris 2009, Rantala, Marcinkowska 2011). Sexual imprinting has thus been proposed as an alternative explanation of homogamy in humans (Bereczkei *et al.* 2002).

Imprinting in general is defined as an association of a specific behavior with a specific stimulus without any need for strengthening or conditioning (Lorenz 1982). This genetically canalized learning process is characterized by imprinting of some characteristics or behaviors which occurs only during sensitive period during early individual development. Thus, no sexual motivation is involved in the initial learning process (Immelmann *et al.* 1991, Lorenz 1982), because the sensitive period occurs long before initiation of sex-related behavior (Immelmann, Suomi 1981, Lorenz 1982). Sexual imprinting has a long-lasting effect, and to some degree is expected to be irreversible (Hess 1973, Immelmann, Suomi 1981). As far as we know, only one study has focused on the timing of the sensitive period of sexual imprinting in humans. It has been shown, that older siblings are more prone to be sexually attracted by pregnant and/or lactating women because they were exposed to maternal pregnancy and lactation between their 1.5 and 5 years of age (Enquist *et al.* 2011). We suggest that more research on sensitive period of sexual imprinting in humans is needed. It is important to note that in humans authors often speak about "imprinting-like" mechanism, because the sensitive period is not exactly defined, and mate preferences can develop later during individual ontogeny, not only during the presupposed sensitive period. Little *et al.* (2003) suggested that sexual imprinting in humans is analogous to the process of "social learning".

Sexual imprinting can be either positive, when individuals shape a preference for their parent-similar characteristics (e.g., Bereczkei *et al.* 2009, Perrett *et al.* 2002, Wiszewska *et al.* 2007), or negative, when individuals develop a sexual aversion to individuals similar to their parents or other relatives with whom they have lived during childhood (Westermarck 1921).

From the evolutionary perspective, sexual imprinting importantly affects sexual selection. Todd and Miller (1993) have suggested that sexual imprinting is an adaptive mechanism, which helps offspring to find an appropriate partner. In line with this reasoning, offspring inherit not only traits from their parents, but also preferences for them (Laland 1994). Presumably, they "inherit" preferences through social learning, i.e., not genetically.

Positive sexual imprinting

Numerous recent studies have investigated influence of positive sexual imprinting on human mate choice. As shown in a study of ethnically mixed couples from Hawaii, women and men chose partners who were from the same ethnic group as their opposite sex parent was (Jedlicka 1984). Furthermore, it has been found that sexual imprinting influenced several physical characteristics. In the context of eye and hair color Little *et al.* (2003) found that partners of the participants had a similar eye and hair color as participants' parents of the opposite sex. Moreover, it appears that in their partners pubescent girls prefer the eye color of their fathers (not

mothers) (Wilson, Barrett 1987). Furthermore, Perrett *et al.* (2002) showed that individuals who were born to elderly parents preferred potential partners with facial features associated with older age than individuals who were born to younger parents. In line with this, other studies aimed to test possible influence of sexual imprinting on age within couples (Wilson, Barrett 1987, Zei *et al.* 1981); women born to older fathers tend to prefer and marry older men than women who were born to younger fathers. Also, as Schuckit *et al.* (1994) have shown, nonalcoholic daughters who had an alcoholic parent were more than twice likely to marry an alcoholic than daughters of non-alcoholics. It has been reported that sexual imprinting influences also cultural traits, in particular smoking (Aronsson *et al.* 2011). In this study authors reported that heterosexual men preferred smoking only when their mother smoked, and there was no effect when only father smoked during respondent's childhood. In contrast, homosexual males were significantly affected by the smoking habit in both, their mothers as well as fathers. As far as we know, this was the first research focusing on imprinting-like effect not only in heterosexuals, but also in homosexuals. Additionally, the influence of HLA (human leukocyte antigen) on mate preferences was found in the context of sexual imprinting, showing that women are able to choose odor on the basis of HLA alleles inherited from their father but not mother (Jacob *et al.* 2002).

Relationship with parents

The effect of the imprinting might be modulated by the quality of relationship with the parents. Wiszewska *et al.* (2007) measured facial proportions of fathers and male faces that were consequently judged on attractiveness by independent women. Results showed that women judged as more attractive men with similar characteristics as their father had, but this relation was mediated by the quality of relationship with their father during childhood. In men, the effect of relationship with parents on sexual imprinting is, however, not so clear-cut. Bereczkei *et al.* (2002) found that female partners of men were most similar to respondent's mothers, and again, the quality of the relationship with the mother during childhood positively affected similarity of the female partner to the mother. On the contrary, another study showed that men chose women similar to their mothers when they experienced more rejection by mothers during childhood (Gyuris *et al.* 2010). In general, these studies indicate that the relationship with a parent during childhood, whether it was positive, or negative, can influence subsequent partner preference.

To exclude genetic effects of sexual imprinting, Bereczkei *et al.* (2004) have studied women who were adopted as children. The results showed that women preferred male partners who were similar to their stepfather, which means that the mechanism of sexual imprinting is not genetically-dependent. However, another study has not supported these results (Marcinkowska, Rantala 2012). It has been found that quality of the relationship with opposite-sex parent during childhood did not predict the level of the perceived facial resemblance between respondent's partner and parent. In line with Bereczkei *et al.* (2004), Zietsch *et al.* (2011) reported no genetic effects on mate choice neither in dizygotic nor in monozygotic twins. However, authors have not found any other sexual imprinting effect, in other words twin's partners were not more similar to twin's opposite-sex parent than to others who share similar level of common genes (i.e., co-twin, same-sex parent). Another twin study concluded that partner preferences are influenced by genetic factors in 10 to 30%, while 10% is due to shared environmental factors and 60% is due to unique opportunity (Rushton, Bons 2005). Furthermore, results of Bereczkei *et al.* (2004) study are consistent with findings of Kenderick *et al.* (1998) from their cross-fostering animal research. It has been suggested that social and sexual preferences of the cross-fostered sheep were irreversibly shifted towards individuals of the foster species. Interestingly, these preferences prevailed in males even after three years of living exclusively with their own species, preferences in females were however weaker, reversible and prevailed within one to two years. In the case individuals are imprinted on opposite-sex parent, these findings are in line with the fact that among non-human species, maternal care is more common than paternal (Burley 1977), and the imprinting mechanism might thus be stronger in males, rather than females. Following this logic it is not surprising that relationship with parents strongly influences imprinting in humans, because in contrast to the majority of non-human mammals, human care is often bi-parental. From this perspective we cannot fully exclude the influence of same-sex parent in sexual imprinting in humans, and also other caring individuals such as siblings or other close relatives. This idea has been supported by Watkins *et al.* (2011), who found out that women, who reported higher emotional closeness to their fathers but not mothers during their childhood, preferred self-resembling opposite-sex, but not same-sex, faces. In contrast to these findings, women's reported emotional closeness to their mother did not predict preferences for self-resemblance in either opposite-sex

or same-sex faces. These results imply that influence of phenotype-matching and sexual imprinting on mate choice coincides to a certain degree, but not completely. In other words, individuals can prefer potential mates who are self-similar on the basis of phenotype-matching theory, but in the context of sexual imprinting (i.e., preference for parent-similar partners) the quality of relationship with the parent during childhood seems to be a crucial factor. Therefore, more studies on the link between sexual imprinting and phenotype-matching theory are needed before any generalization can be made.

Negative sexual imprinting

The second form of imprinting, negative imprinting, is supposed to be an adaptation to prevent inbreeding. It is also called Westermarck effect after the Finland Swedish philosopher and sociologist Edvard Alexander Westermarck (1921). According to this theory, children or youngsters have an innate tendency to develop a sexual aversion toward individuals, with whom they grew up (usually siblings and/or parents). In humans this effect has been supported by studies in Israeli kibbutzim, where children were raised together with their peers (including potential partners) instead of being raised in their birthplace by biological parents. At the time of sexual maturity, these individuals preferred to choose partners outside the kibbutzim rather than looking for a partner among those with whom they grew up (Shepher 1971). An even stronger empirical support of Westermarck effect was reported in Taiwan, where traditionally marriage was negotiated at a time when the children were still minors (Wolf, Huang 1980). Mothers soon after the birth of their daughters handed them over to future husband's family, where they were brought up together. As it turned out, such marriages had three times lower fertility and divorce three times higher than marriages, in which partners were not brought up together. The crucial determinant of the intensity of sexual aversion between partners was the girl's age at adoption. The lower age at the adoption predicted lower fertility rate, higher rate of divorce, and extramarital affairs. Interestingly, the age of the family's son when the girl was adopted played little or no role. The impact of the common upbringing, where prospective partners grew in close intimate contact, is negative not only in terms of reproductive success, but also in the quality of the relationship. Additionally, it has been shown that the awareness of the kinship decreases the attractiveness of other people (Fraley, Marks 2010).

It is noteworthy, that this biological mechanism enforcing inbreeding avoidance has a social analogy – incest avoidance. Social mechanism regulating sexual behavior among relatives by marriage is called incest taboo (Bischof 1972). Freud (1918/2012) in his incest theory claimed that close relatives are attracted to each other and are mutually desirable partners, and that is the reason why there must be specific restrictions prohibiting incest. According to him, this prohibition is necessary to prevent the destruction of the human race through family breakdown. Thornhill (1991) in her study explained why incest taboos prohibiting sex between close relatives exist only in 44% of human societies. According to the author the existence of this restriction, much more than with sex between relatives, is related to the protection of property, trying to protect paternity and efforts to prevent the breakdown of the family alliance, which could occur as a result of sexual tension in the family.

Sexual imprinting in evolutionary perspective

From evolutionary perspective an ultimate goal of sexual imprinting on mate choice is to achieve an optimal balance between inbreeding and outbreeding (see below). In other words, sexual partners should slightly differ from parents, but not too much (Bateson 1983). It is suggested that one of the functions of imprinting is species recognition of potential sexual mates (Hansen *et al.* 2007). As Bovet *et al.* (2012) have suggested, certain level of homogamous preferences can develop only in case of an extend outbreeding depression, like disruption of local adaptation (which is relatively disadvantageous, because of the disintegration of the evinced combinations of cultural or genetic complex), or underdominance (selection against the mean of the population distribution). Following this logic it would be ideal, if there is an optimal balance between inbreeding and outbreeding (Bateson 1983). Laland (1994) has specifically suggested four general effects of sexual imprinting in animals. First, imprinting prevents spreading of mutations in population, because offspring inherit preferences for characteristics that their parents have. Hence, the individuals will not prefer novel traits in potential partners. Second, imprinting aggravates a genetic polymorphism to exist in a population, which will more frequently become fixed. Third, imprinting can create a population barrier, because it conserves genetic differences between them. Fourth, imprinting can change the direction of sexual selection, because it shapes mating preferences in way, which does not have to be in accordance to sexual selection. Thus, imprinting can even decrease inclusive fitness.

On the population level, pairing of individuals on the principle of homogamy can lead to unification of future

generations, whose phenotypes and genomes become increasingly similar. Single alleles can accumulate, thereby increase the expression of traits which are coded by the gene. Ultimately, homogamy can lead to differentiation and development of various groups such as different ethnic groups, and to increasing similarities within the groups. In the end the groups become more different from each other (Jones 1929). However, this issue is not unequivocal, based on results of mathematical modeling, Crow and Kimura (1970) argue that assortative mating is not expected to change allele frequencies of a population, but it only modifies the heterozygosity of genetic loci and does not drive selection.

NEGATIVE ASSORTATIVE MATING

According to the principle of complementarity, and in contrary to the principle of homogamy, individuals are coupled with partners with opposite characteristics to themselves. It is important to note, that complementarity and negative assortative mating do not need to be synonymous. If individuals couple according to the negative assortative mating, it simply means that they are mutually less similar, but their characteristics need not to be just opposite.

Winch (1958) from sociological perspective suggested that partner selection is based on satisfaction of one's own needs. He distinguishes between two types of exchanges: first, when the same needs are satisfied in both partners, but in different intensities, and second, when each of the partners satisfies different needs. In this case, partners can be either positive to each other, complementary, or conflicting. Based on this principle, complementarity can increase the chance of satisfying own needs.

Nevertheless, while the principle of homogamy has gained extensive empirical support (see above), principle of complementarity has been supported in fewer studies. In contrast to homogamy, relationships based on complementarity have shorter durations and are terminated earlier than relationships based on homogamy in a number of psychological characteristics (Felmlee 2001). Complementary traits that were initially attractive frequently became perceived as negative in the course of the relationship. This conclusion is consistent with the study where it was shown that partners who fell in love at first sight showed lower similarity in personalities (extraversion, emotional stability, and autonomy) than couples, who did not fall in love at first sight (Barelds, Barelds-Dijkstra 2007), although it is important to note, that lower similarity does not necessarily mean complementarity. Complementary are only such traits, which complement each other (e.g., submissivness and dominance). What is more, it is disputable to speak about complementarity in many characteristics, in other words, lower similarity between partners in e.g., education, eye color, or facial traits does not mean, that they are complementary. According to these researches we might predict that individuals are primarily attracted on the basis of the principle of complementarity for short-term relationships, while for long-term relationship self-similar traits are more desired. Regan *et al.* (2000) have supported this theory, when they compared preferences for short-term sexual relationship and long-term romantic relationship. They found that for short-term relationship the most valued traits are related with sexual desirability (e.g., attractiveness, sex drive, health), while for long-term relationship the most desired traits are self-similar and socially appealing personality characteristics (e.g., intelligence, honesty). Moreover, although individuals believe that they desire complementary characteristics in their potential partners, they choose partners with rather self-resembling traits (Dijkstra 2008). Partner preferences and actual partner choice thus differ to some degree.

Submissiveness and dominance

Interestingly, in one domain of interpersonal interactions, in particular dominance and submissiveness, complementarity has been shown to have a positive effect on relationship dynamics (Tiedens, Fragale 2003). The dominance dimension of interpersonal interactions refers to the degree to which an individual behaves in a dominant or a submissive way toward the other person, and according to the interpersonal theory, in addition to affiliation dimension, dominance dimension is one of the two primary dimensions of interpersonal behavior (Carson 1969, Leary 1957). Individuals who had a complementary partner in relationship hierarchy (e.g., dominant individuals had submissive partners and vice versa), reported higher degree of relationship satisfaction than those who had a partner with rather similar level of interpersonal domain of dominance (Dryer, Horowitz, 1997). In the domain of nonverbal behavior, participants with complementary reaction to their partner (dominant to submissive and vice versa) have felt more comfortable and liked their partner more than participants who mimicked their partner (Tiedens, Fragale 2003). Another study has suggested that romantic couples who rated their relationship as the most satisfying were more similar in warmth but less similar in terms of dominance

than couples with the lowest reported level of relationship quality (Markey, Markey 2007). It is worth pointing out that preferences for complementarity in relationship dominance have been reported even in countries promoting the value of equality and relationship hierarchy as displayed by non-verbal behavior was thus by authors of the study interpreted as an unconscious or automatic mechanism (Tiedens, Fragale 2003). From an evolutionary perspective, complementarity of dominant and subordinate behavior serves to regulate aggression and conflict in dyads and facilitates cohesion in social group encounters (Fournier *et al.* 2002), which is supported by neuroimaging studies in both humans and non-human social species (Beasley *et al.* 2012). As the authors state, neuroimaging indicates the involvement of limbic, prefrontal, and striatal pathways in human social rank processing. This system is responsible for processing the status information during social exchange. Thus, complementary hierarchical position of the partners within their relationship might be considered (a specific domain predicting relationship satisfaction) also in human long-lasting bonds.

Major histocompatibility complex

Another candidate for a positive effect of complementarity is major histocompatibility complex (MHC). MHC genes (termed HLA in humans) are highly polymorphic genes which play important role in immune processes. In particular, antigens coded by MHC class I genes are responsible for recognition of cells containing proteins of foreign origin. Individual alleles of MHC genes code proteins that differ in the spectrum of short peptides they bind and transport across the cellular membrane. On the cell surface, MHC glycoproteins present these peptides to T-cells. Under normal conditions, negative selection in the thymus eliminates most self-peptide reactive T-cells. Therefore, mature T-cells can recognize and be activated only by foreign-peptide presenting cells. Activation of T-cells is the principal component of both cellular and antibody immune response (Havlíček, Roberts 2009). It has been suggested that women prefer partners with complementary MHC, and it has thus been further reported that non-similarity between partners in MHC can reduce risk of serious illnesses in their potential offspring. As the expression of MHC genes is codominant, offspring of parents with dissimilar MHC genes will express wider range of MHC proteins which will consequently develop immunity to wider range of parasites or pathogens (Roberts *et al.* 2005). It has been reported that married couples are less similar to each other in MHC than expected by random mating (Ober *et al.* 1997); however other studies have not supported this conclusion (Hedrick, Black 1997, Ihara *et al.* 2000). Women preferred men with dissimilar MHC; however, this difference in odor assessment was reversed in case when women rating the odors were using oral contraceptives (Roberts *et al.* 2008, Wedekind *et al.* 1995). Roberts *et al.* (2005) reported that women judged faces of men with similar MHC as more attractive, particularly in condition of judging them for a long-term relationship (for review on this topic, see, Havlíček, Roberts 2009). Thus, principles of complementarity or homogamy in MHC preferences are rather mixed, or random mating in this trait might be employed.

CONCLUSIONS

In our overview we have attempted to summarize two basic theories of mate choice from the perspective of evolutionary psychology and human ethology. As shown, both theories are closely connected (by the proximate and ultimate mechanisms), and we suggest that principle of homogamy (and mechanism of sexual imprinting) and complementarity in mate choice are not necessarily mutually exclusive. In fact, these principles may complement each other. We assume that in their potential partners, individuals can prefer some characteristics that are similar to their own, and other characteristics that complement their own traits. Self-similarity might be advantageous in socio-cultural traits, because the similarity among partners in such traits has been shown to contribute to cohesion between partners and relationship satisfaction. As concluded by Buston and Emlen (2003), mate choice in western societies is in numerous characteristics driven by the principle of homogamy rather than complementarity. From this perspective we could conclude that both principles influence distinct domain of mate choice. Principle of homogamy affects rather preferences and real choice in socio-cultural aspects, while principle of complementary influences more likely biological-relevant factors.

To what extent it is advantageous or disadvantageous to be similar or complementary with a partner can depend on many factors, such as prospects of the relationship, socio-cultural factors, or potential genetic benefits. The problem of the above mentioned studies is that they have mostly focused on only one trait (e.g., facial similarity) or a dimension of characteristics (e.g., demographic data), which are eventually found to to be rather similar or different among partners. It usually does

not apply to the entire range of features including physical, personality, or behavioral traits. Further research should therefore focus on more complex investigation of similar and complementary characteristics which contribute to relationship quality. From the evolutionary point of view we can assume that preference for homogamy is adaptive in terms of outbreeding depression avoidance, although on the other hand complementarity might have developed under the pressure of inbreeding depression avoidance (Bovet *et al.* 2012). We thus suppose that in general, a compromise between an extreme homogamy and an extreme complementarity is optimal and adaptive, although the level of self-similarity or self-dissimilarity might depend on many environmental, socio-cultural, or biological factors.

Another important factor is temporal context of the relationship. Physical characteristics are more important in the initial phase of relationships, whereas psychological and demographic traits are more important for long-term relationships (Buss 1985, Keller *et al.* 1996). This conclusion is also supported by research according to which self-resemblance decreases attractiveness in the short-term sexual context, but has no effect in the long-term context (DeBruine 2005). On the contrary, it has been suggested (Nojo *et al.* 2011) that facial resemblance plays an important role in the context of long-term, but not short-term relationship. Moreover, the preferences are also sex-specific. Thus, in the long-term context women do not prefer self-similar male faces, while males prefer female faces dissimilar to their mothers. These results are related to the above-mentioned theories in long-term partners (as opposed to short-term) are the most valued social quality.

Studies aimed at mechanism of sexual imprinting show that individuals prefer in their (potential) partners features similar not only to themselves, but also to their opposite-sex parent (McCrae *et al.* 2012, Watkins *et al.* 2011). In any case, because of the genetic closeness of parents and their offspring it is questionable if individuals prefer self-similar partners on the basis of homogamy or sexual imprinting. From this point of view the principle of homogamy and sexual imprinting coincide to considerable extend. As outlined above, the ultimate function of sexual imprinting might be, among other things, finding an eligible long-term partner based on the template of parent's characteristics and their relationship (Todd, Miller 1993). In other words, individuals could on the basis of sexual imprinting prefer homogamous rather than complementary partners. We suggest that future studies should target not only particular characteristics of opposite-sex parent, but they should explore the relationship between the features of both parents, because the partner preferences may arise also on the basis of parent's mutual similarity. For example, individuals need not prefer a similar level of some trait (e.g., extent of extraversion), but they may prefer (this) similarity level of that trait between their parents (how similar or dissimilar are parents in extraversion).

It could be said that although we subconsciously desire for a complementary partner (at least in some traits), which might be adaptive for a potential offspring, self-similarity might be rather advantageous for a long-term relationship, because of the social benefits that naturally arise from this kind of relationship. If something is beneficial in the modern society, it does not need to go in hand with the fact that it has been shaped by thousands of years of evolution.

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Příloha II

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10 SEXUÁLNÍ IMPRINTING V KOMPARATIVNÍ PERSPEKTIVĚ

Zuzana Štěrbová, Jan Havlíček

Preference pro výběr partnera v rámci jedné kultury vykazují relativně vysokou shodu (např. lidé poměrně univerzálně preferují partnery, kteří jsou přívětiví, příjemní či mají smysl pro humor). Neméně důležitou roli však hrají individuální faktory, díky nimž se partnerské preference mohou mezi jedinci významně lišit. Klíčovým faktorem, který by mohl tyto rozdíly vysvětlit, je předchozí zkušenost s blízkými příbuznými. Otázkou však zůstává, jaké mechanismy stojí na pozadí vzniku těchto individuálních preferencí. Jedním z nich by mohl být tzv. imprinting neboli vtištění.

Ve 30. letech 20. století si rakouský etolog Konrad Lorenz všiml, že čerstvě vyklubaná mláďata kachen či hus mají tendenci následovat první pohybující se objekt, který se vyskytuje v jejich okolí. Takovým objektem může být i člověk, jako tomu bylo v případě Konrada Lorenze, kterého mláďata husy velké následovala, jako by šlo o jejich rodiče. Na základě těchto pozorování postuloval Lorenz definici imprintingu.[1] Jde o geneticky usměrněnou formu učení, při níž dochází k asociaci určitého způsobu chování (např. následování) s určitou podnětovou situací (např. první pohybující se objekt). Tato forma učení však není podmíněna následným posilováním, nýbrž jednorázovou expozicí (vtištěním). K vtištění dochází výhradně během druhově specifického období života, tzv. senzitivní periody. Vtištění má navíc dlouhotrvající efekt, který je obtížně modifikovatelný. Jak však ukázal následující výzkum, výše uvedená definice je příliš rigidní. V některých případech nemusejí být naplněny všechny její podmínky, např. nezvratitelnost. Formy učení podobné imprintingu se mohou vyskytovat v několika různých kontextech, proto hovoříme např. o imprintingu rodičovském, sexuálním, sociálním či rivalském.

Tato kapitola se primárně zaměřuje na sexuální imprinting u člověka. Abychom však tomuto fenoménu mohli porozumět, je nezbytné v krátkosti představit i imprinting rodičovský. Sexuální imprinting, neboli vliv rodinných příslušníků na výběr partnera, může být pozitivní nebo negativní. Prostřednictvím pozitivního sexuálního imprintingu dochází k vytváření partnerských preferencí na základě charakteristik rodinných příslušníků, zatímco negativní sexuální imprinting je mechanismus, jehož prostřednictvím se vytváří sexuální averze vůči jedincům, s nimiž daný jedinec vyrůstal. Následně se věnujeme vlivu kvality vztahu s rodinnými příslušníky během dětství na utváření partnerských preferencí. Celou problematiku nahlížíme ve srovnávací perspektivě, což nám umožňuje polemizovat, zda je u člověka adekvátní hovořit o sexuálním imprintingu. V závěru nastíníme směry, jimiž by se mohl budoucí výzkum dané problematiky ubírat.

RODIČOVSKÝ IMPRINTING

Mláďata některých druhů ryb, ptáků a savců si během určitého období po narození vtisknou charakteristiky jedince, který se vyskytuje v jejich blízkosti. V typickém případě je takovým jedincem rodič, jehož na základě naučených charakteristik (např. zbarvení, zpěv, tvar zobáku) mohou následně rozpoznat mezi ostatními členy vlastního druhu. Mláďata se díky tomuto vtištění drží poblíž rodiče, což výrazně zvyšuje jejich šance na přežití (např. se tím snižuje riziko napadení predátory, zajišťuje přísun potravy). Dá se tak předpokládat, že tento typ učení vznikl v důsledku přirozeného výběru.

Rodičovský imprinting u nekrmivých ptáků je kontrolován dvěma nezávislými neurálními systémy.[2] Čerstvě vyklubaná mláďata si nejdříve vtisknou objekt vhodný k následování (obvykle cokoli, co se pohybuje a má oči). Jinými slovy objekt, který budou následovat, je výsledkem předchozí zkušenosti, zatímco samotný akt následování na předchozí zkušenosti závislý není. Pokud by fixace vzhledu rodiče byla podmíněna geneticky, v případě smrti rodiče by mláďata nemohla následovat nikoho jiného a pravděpodobně by velice záhy zahynula. Neurální imprinting tak poskytuje adaptivní flexibilitu, čímž zvyšuje šanci na přežití. Je však také možné, že genetická fixace vzhledu rodiče je neurálně komplexnější řešení a přírodní výběr preferoval řešení pomocí geneticky kanalizované formy učení.

Fungování rodičovského imprintingu bylo zjištěno i u některých savců, pročež se odborníci zaměřili na otázku, zda obdobný mechanismus existuje i u člověka. Například se ukázalo, že děti již v prenatálním stadiu vývoje začínají rozeznávat hlasy svých rodičů. Dále bylo zjištěno, že novorozenci rozeznávají matku i na základě čichu, kdy záhy po narození upřednostňují vůni plodové vody a prsu vlastní matky. Taktéž bylo zjištěno, že v průběhu prvních týdnů života jsou děti schopny individuálně rozeznat matčinu tvář. V současné době se diskutuje o tom, zda rozpoznání těchto charakteristik ovlivňuje vznik vazby (tzv. attachmentu) mezi potomkem a pečovatelem.[3] Dosud ovšem není zřejmé, zda výše uvedené učení se charakteristik rodičů naplňuje definici imprintingu, nebo jde o běžné asociativní učení. Schopnost učit se charakteristiky rodičů totiž zřejmě souvisí s mírou expozice, tedy jak často a dlouho jsou děti s rodiči v kontaktu.

SEXUÁLNÍ IMPRINTING

Partnerské preference mohou být rodinnými příslušníky ovlivňovány různými způsoby, jako např. aktivní snahou zasahovat do výběru partnera, prostřednictvím dědění preferencí či mechanismem sexuálního imprintingu. Jak ukázaly výzkumy na jiných živočišných druzích (zejména ptácích), charakteristiky vtištěné v rámci rodičovského imprintingu mají v období pohlavní dospělosti vliv i na partnerské preference. Tento efekt nazýváme sexuální imprinting, který může být pozitivní nebo negativní. Negativní sexuální imprinting je také znám jako Westermarckův efekt,[4] podle něhož mají jedinci tendenci vytvářet si sexuální averzi vůči těm, s nimiž vyrůstali (což jsou obvykle sourozenci a rodiče, tedy geneticky nejbližší příbuzní). Pozitivní sexuální imprinting je definován jako raná fixace charakteristik blízkých příbuzných, která následně formuje partnerské preference v dospělosti.[5] Jinými slovy to znamená, že si jedinec během dětství vytvoří obraz blízkých osob, s nimiž je v každodenním kontaktu, a v dospělosti poté preferuje takové partnery, kteří jsou tomuto obrazu podobní. Nejde však o preferenci konkrétních jedinců, jejichž vlastnosti byly internalizovány (např. rodiče nebo sourozenci), jde o obecnou preferenci nepříbuzných osob, které mají podobné charakteristiky jako rodiče. Důležité je však upozornit, že pozitivní a negativní imprinting nestojí v přímém protikladu. Zatímco podle negativního imprintingu si vytváříme sexuální averzi vůči konkrétním jedincům, s nimiž vyrůstáme (rodiče, sourozenci aj.), podle pozitivního imprintingu v období pohlavní dospělosti preferujeme partnery, kteří se našim blízkým podobají (ne však příbuzné samotné).

Jak již bylo naznačeno výše, je možné, že fylogeneticky původní formou je rodičovský imprinting, přičemž sexuální imprinting je formou odvozenou na základě evolučního procesu zvaného koopce. Koopce je proces, při němž je určitá struktura (či psychologický mechanismus), která se vyvinula původně za účelem plnění určité funkce, následně využita pro plnění funkce jiné. V případě sexuálního imprintingu se o jeho funkci stále vedou spory. Někteří autoři se domnívají, že primární funkcí sexuálního imprintingu by mohlo být dosažení optimální rovnováhy mezi inbreedingem a outbreedingem.[6] Jinými slovy partneři by se měli od rodičů do určité míry lišit, ale ne příliš. Mezi negativní důsledky inbreedingu, tedy příbuzenského křížení, patří snížení genetické variability* potomstva, a především pak hromadění letálních alel, které mohou zapříčinit nejen sníženou schopnost reprodukce daného nositele, ale často i jeho předčasnou smrt. Naproti tomu outbreeding je definován jako křížení jedinců ze vzdálených a geneticky odlišných populací.[7] Mezi hlavní negativní dopady outbreedingu patří narušení lokálních adaptací či genových komplexů, které jsou výsledkem přizpůsobení se místnímu prostředí. Vyvážení míry inbreedingu a outbreedingu může mít zásadní význam pro reprodukční úspěch, což ukázala nedávná studie, která zkoumala vztah mezi stupněm příbuznosti a plodností na Islandu.[8] Autoři této studie zjistili, že největšího reprodukčního úspěchu (měřeno počtem potomků, počtem potomků, kteří se reprodukovali, a počtem vnoučat) dosahují ty páry, které jsou navzájem příbuzné na úrovni bratrance a sestřenice ze třetího a čtvrtého kolene.

Sexuální imprinting ale může být evolučně výhodný i z jiného důvodu. Jde totiž o velice flexibilní mechanismus učení, který umožňuje vtisknout si takové fenotypové charakteristiky, které jsou adaptované na současné podmínky, a nikoli na podmínky, které byly aktuální v předchozích generacích. Naopak jedinec s geneticky fixně zakódovanými preferencemi by riskoval, že v prostředí, kde se fenotyp (soubor všech pozorovatelných znaků organismu) mění rychleji než genotyp (soubor všech genů v organismu), nenalezne vhodného partnera.

V neposlední řadě by mohlo být funkcí sexuálního imprintingu rozpoznání jedinců vlastního druhu, respektive vhodných potenciálních sexuálních partnerů. S charakteristikami rodičů se totiž nedospělý jedinec současně učí i základní charakteristiky svého druhu. Ačkoli se tento aspekt může jevit z lidské perspektivy jako okrajový, u celé řady druhů, které sdílejí s příbuznými druhy areál výskytu, může jít o značný selekční tlak na vyhýbání se páření s jedinci nepříbuzného druhu. Mezidruhoví kříženci mají obvykle nižší životaschopnost, a snižují tak reprodukční úspěch svých rodičů. Pokud by hlavní funkcí sexuálního imprintingu bylo rozpoznávání jedinců vlastního druhu, vznik

* Biologicky příbuzní jedinci sdílejí více společných variant genů než jedinci nepříbuzní (pro ilustraci: děti s každým rodičem sdílí 50 % společných variant genů, prarodiče a vnoučata 25 % atd.). Proto následkem reprodukce dvou geneticky blízkých jedinců dochází k předání více stejných variant genů společným potomkům, čímž dochází ke snížení genetické variability.

preferencí na základě individuálních charakteristik rodičů by mohl být pouhým vedlejším produktem výše jmenovaného, a neměl by tak žádnou funkci. Otázkou však stále zůstává, jakou roli hraje sexuální imprinting u lidí. Abychom mohli hovořit o imprintingu, musí být naplněno několik základních předpokladů.

Předpoklady sexuálního imprintingu

Senzitivní perioda

Ústředním pojmem v mechanismu sexuálního imprintingu je senzitivní perioda. Toto období zvýšené citlivosti je fáze vývoje, v níž probíhá vtištění charakteristik blízkých příbuzných, a mimo takové období již nemůže k vtištění dojít. Ve velkém množství případů má extrémně krátké trvání.[1] Například u některých ptáků trvá pouze několik hodin od vylíhnutí do doby, než je mládě schopné samo se postavit. U kachen divokých probíhá senzitivní perioda pro vtištění maximálně do 15. hodiny po vyklubání. U lidí obdobná senzitivní perioda nebyla identifikována, a proto zůstává otázkou, zda je možné o senzitivní periodě, potažmo sexuálním imprintingu, u člověka vůbec uvažovat. V případě, že by senzitivní období nebylo identifikováno, je možné, že nejde o sexuální imprinting, ale nějaký jiný psychologický mechanismus.

V dosavadních výzkumech bylo načasování senzitivní periody převzato z prací Sigmunda Freuda,[9] konkrétně z teorie oidipovského komplexu, který spadá do třetího, falického, stadia psychosexuálního vývoje dítěte. Podle této teorie si chlapci během falického období (mezi 3. a 5. rokem) vybírají sexuální objekt, což je obvykle matka. Následkem toho lidé v pozdějším věku preferují jedince, kteří jim připomínají rodiče opačného pohlaví, kterého v období mezi 3. a 5. rokem internalizovali jako první objekt svého sexuálního zájmu. Freud však byl k vytvoření hypotézy oidipovského komplexu inspirován pacientem léčícím se z deprese a obsese a zároveň sám nikdy neprováděl přímá pozorování dětí, aby mohl hypotézu empiricky podpořit. Dokonce ani vývojoví psychologové nenalezli žádné doklady, že klasická teorie oidipovského komplexu skutečně funguje.[10] Jak ukázaly později provedené výzkumy, Freudova hypotéza, že jsou děti sexuálně přitahovány ke svým rodičům, je založena na mylných předpokladech. Podle Westermarckova efektu, který na rozdíl od Freudovy hypotézy empirickou podporu získal (viz níže), si naopak děti vytvářejí k jedincům, s nimiž vyrůstaly (tedy trávily čas v době útlého dětství), sexuální averzi. Z výše zmíněných důvodů se domníváme, že by se mělo od inspirace v načasování senzitivní periody sexuálního imprintingu podle falického stadia psychosexuálního vývoje dle Freuda upustit.

Nedávná studie provedená ve Švédsku[11] však naznačuje, že by se senzitivní perioda sexuálního imprintingu mohla vyskytovat i u lidí. Bylo zjištěno, že muži, kteří mají mladšího sourozence, a byli tak mezi svými 1,5 a 5 lety vystaveni těhotné či kojící matce, častěji uvádějí, že mají fetiš právě na těhotné či kojící ženy. Výsledek naznačuje, že tyto preference mohou být následkem internalizace matčiných charakteristik během raného dětství. Je však otázkou, zda z tak specifického fenoménu, jako je vznik sexuálních fetišů, které se objevují jen u velmi malé části populace, můžeme usuzovat na obecněji se vyskytující psychologické mechanismy. Jak se však zdá, vliv rodičů na vznik partnerských preferencí nemusí probíhat po období celého dětství stejným způsobem. Podle výsledků současné britské studie[12] měla kvalita vztahu s rodiči v různém věku odlišný dopad na následné partnerské preference i skutečný výběr. Ukázalo se, že ideální a skutečný partner byl podobný rodiči tehdy, když od rodiče ženy obdržely vyšší emoční podporu v období puberty, a naopak když obdržely nižší emoční podporu během raného dětství. Tyto výsledky naznačují, že pro případnou identifikaci načasování senzitivní periody je důležité brát v potaz kvalitu vztahu s rodiči, který může hrát v různých fázích dětství odlišnou roli.

Nezvratitelnost

Podle původní Lorenzovy definice je po ukončení procesu vtištění jeho efekt dlouhodobý, velmi obtížně modifikovatelný jinými zkušenostmi a často zcela nezvratitelný.[13] Jde o jeden z rysů, který jej odlišuje od asociativního učení, u kterého může být chování poměrně snadno odnaučeno či změněno. Konrad Lorenz např. nechal mládě husy velké izolované od zbytku jedinců jeho druhu déle než jeden týden, aby nedošlo k vtištění jeho vlastního druhu, nýbrž člověka. Poté house přesunul do péče krůty domácí, od níž se brzy naučilo nechat se zahřívat namísto elektrického přístroje, který předtím preferovalo jako zdroj tepla. Následujících čtrnáct dní, nebyl-li v dohledu člověk, zůstávalo house u krůty. Avšak ve chvíli, kdy se house stalo samostatným a nepotřebovalo již zahřívat, opustilo ji a začalo se »potloukat« u vchodových dveří, kde čekalo na člověka, kterého by mohlo následovat.

Studie zaměřené na savce však ukázaly, že proces vtištění nemusí být jednoznačně nezvratitelný. Tyto výzkumy byly založeny na křížové výměně mláďat u kozy domácí a ovce domácí.[14] Jinými slovy jehňata byla vychovávána kozou a kůzlata ovcí. V dospělosti samci vykazovali sociální a sexuální preference pro samičky stejného druhu, jakého byla jejich náhradní (a nikoli biologická) matka. Zajímavé je, že preference samců byly ireverzibilní, a to dokonce i po 3 letech soužití výhradně s jedinci vlastního biologického druhu, zatímco u samiček se po zhruba 2 letech objevily preference pro vlastní druh. Silnější vliv sexuálního imprintingu u samců než u samic byl nalezen i v případě několika ptačích druhů. Jedním z možných vysvětlení je, že u obratlovců je péče o potomky oběma rodiči poměrně vzácná, přičemž pečujícím rodičem je většinou matka.

U lidí je trvalost vlivu rodičů na výběr partnera spíše sporná. Výzkumy ukazují, že preference a výběr partnera jsou modifikovány kvalitou vztahu s rodičem během dětství, což by spíše než pro imprinting hovořilo ve prospěch určitého typu asociativního učení. Vzhledem k délce života člověka by bylo velmi neadaptivní, kdyby naučené preference byly zcela ireverzibilní, poněvadž došlo-li by k internalizaci neadaptivních charakteristik, kterážto by nemohly být následně modulovány, mělo by to pravděpodobně negativní dopad na reprodukční úspěch daného jedince. Lze tedy říci, že i z tohoto hlediska je diskutabilní, zda je v případě lidí vhodné hovořit o sexuálním imprintingu.

Prodleva mezi vtištěním a spuštěním daného chování

Jak již bylo řečeno výše, senzitivní perioda pro sexuální imprinting se nachází v té fázi ontogeneze, v níž se daný způsob chování (výběr partnera) nemůže uplatnit. K vtištění objektu, vůči kterému bude určité chování směřováno, dochází dlouho předtím, než samotné chování nastane. Tento předpoklad, na rozdíl od předchozích dvou, platí výhradně pro sexuální (a nikoli rodičovský) imprinting.

Sexuální imprinting je popisován jako dvoufázový proces.[15] Během první (akviziční) fáze, která koresponduje se senzitivní periodou vyskytující se v rané fázi vývoje mláďat, dochází k vtištění charakteristik blízkých příbuzných. Druhá (konsolidační či stabilizační) fáze se objevuje v době pohlavní dospělosti, kdy se u jedinců začnou objevovat první náznaky sexuálního chování. Během této fáze se vtištěné charakteristiky stanou součástí partnerských preferencí. Mláďata tak získají preference pro jedince, kteří se vyskytují v jejich bezprostředním okolí, což potvrdilo několik experimentů nejen s rozličnými druhy ptáků, ale i savců. Například v případě chůviček japonských a zebřiček pestrých byla vajíčka chůviček v hnízdě nahrazena vajíčky zebřiček. Ti samečci zebřiček, kteří byli vychováváni a krmeni chůvičkami, v období pohlavní dospělosti vykazovali výhradní sociální a sexuální preference vůči chůvičkám. Tyto výsledky naznačují, že pokud jedinci vyrůstali s jiným než vlastním biologickým druhem, v pohlavní dospělosti preferují jako sociální a sexuální partnery spíše jedince z náhradního druhu než svého vlastního. U kavky obecné dochází k vtištění sexuálních reakcí v době, kdy neopeřené mládě ještě sedí v hnízdě, avšak zřejmé se stávají až po dvou letech. Dalším příkladem může být kachna pižmovka velká, jejíž vajíčka vyseděla husa velká. Od sedmého týdne života se pižmovka se svými náhradními rodiči ani s jinou husou nesetkala. Do této doby byl již zřejmě ustanoven objekt, vůči kterému bude vykazovat své sexuální chování. O deset měsíců později začala pižmovka projevovat své sexuální chování právě vůči huse, a nikoli jedincům svého vlastního druhu.

Výše zmíněné předpoklady fungování sexuálního imprintingu jsou u lidí doposud nejasné a nikdy nebyly jednoznačně podpořeny. Vzhledem k výše uvedenému se domníváme, že u člověka je v případě používání pojmu sexuální imprinting na místě určitá zdrženlivost. Ačkoli i u lidí bylo zjištěno, že charakteristiky rodičů internalizované během dětství hrají při výběru partnera určitou roli (viz níže), je otázkou, jaké mechanismy stojí v pozadí. Tyto fenomény sice připomínají sexuální imprinting, u lidí však nejsou naplněny základní charakteristiky plynoucí z původní definice, a proto výzkumníci referují spíše o efektu podobném imprintingu (imprinting-like effect).[16]

Efekt podobný pozitivnímu imprintingu

Efekt podobný pozitivnímu imprintingu je charakterizován jako preference pro obdobné vlastnosti, jaké měli rodinní příslušníci v době jedincova dětství. Tento fenomén byl u člověka zkoumán na několika různých charakteristikách. Například studie zaměřená na etnicky smíšená partnerství z Havaje zjistila, že jedinci mají tendenci vybírat si partnery stejného etnika, jako je jejich rodič opačného pohlaví (tzn. ženy podle otců a muži podle matek).[17] Tato studie ukázala, že efekt podobný imprintingu je u lidí primárně závislý na charakteristikách rodiče opačného pohlaví.

Několik dalších studií se zaměřilo na věk a s ním spojené charakteristiky. Bylo např. zjištěno, že ženy, které se narodily starším otcům, si častěji braly starší muže.[18] Podobně jedinci, kteří se narodili rodičům starším 30 let, u partnerů preferovali v mnohem větší míře obličejové rysy související s vyšším věkem než jedinci, kteří se narodili rodičům mladším. U žen hrál hlavní roli věk otce, zatímco v případě mužů věk matky. Navíc u mužů byl tento vliv nalezen pouze v případě preferencí pro dlouhodobé vztahy.[19] Tyto výsledky naznačují, že imprintingu podobný efekt by mohl hrát rozdílnou roli u krátkodobých a dlouhodobých vztahů. Bylo by tak zajímavé zjistit, zda sexuální imprinting ovlivňuje stejným způsobem nezávazné sexuální a dlouhodobé vztahy.

Dále bylo zjištěno, že dívky pubescentního věku preferují u svých partnerů stejnou barvu očí, jakou má jejich otec (a nikoliv matka).[20] V podobném duchu se ukázalo, že partneři žen mají podobnou barvu vlasů a očí jako jejich otec, zatímco partnerky mužů mají podobnou barvu vlasů jako jejich matka a barvu očí jako oba rodiče.[10] Z dalších fyzických charakteristik byla nalezena podoba mezi partnerem a rodičem opačného pohlaví např. v tělesné výšce či obličejových rysech. V případě pětifaktorového modelu osobnosti* (tzv. Big

* Pětifaktorová struktura popisu osobnosti vychází z lexikálních výzkumů a představuje hypotetické konstrukty (neboli bazální tendence), které mají biologický základ a jsou nezávislé na vlivech prostředí a kultury. Tyto hypotetické konstrukty nemohou být měřeny přímo, lze je však zaznamenat prostřednictvím postojů, zvyků a zálib. Základních pět faktorů představují extraverze, emoční stabilita, otevřenost novým zkušenostem, přívětivost a svědomitost.

Five) bylo v případě žen zjištěno, že se jejich partner podobal oběma rodičům v otevřenosti a matce navíc ve svědomitosti, zatímco v případě mužů měla jejich partnerka podobnou míru extraverze jako jejich otec.[21] Ačkoliv jsou preference a výběr partnera ve větší míře ovlivňovány rodičem opačného pohlaví, určitý vliv mohou mít i charakteristiky rodiče pohlaví stejného, popř. dalších příbuzných, jako jsou sourozenci apod. Tyto závěry potvrdila i studie zkoumající preference pro barvu peří u husy sněžné. Pokud byli rodiče trvale odstraněni, v pohlavní dospělosti husy preferovaly tu barvu peří, kterou měl jejich sourozenec.

Valná většina dosavadních výzkumů byla zaměřena na heterosexuální jedince. Výjimkou jsou dvě švédské studie. První z nich zkoumala efekt kouření a zúčastnili se jí heterosexuální i homosexuální muži.[22] Výzkumníci si položili otázku, zda skutečnost, že respondentův rodič během jeho dětství kouřil, může ovlivňovat jeho budoucí partnerské preference. Jinými slovy, zda děti kuřáků budou v dospělosti za partnery preferovat kuřáky a naopak. Výsledky ukázaly, že heterosexuální i homosexuální muži více preferovali partnera, který kouří, pokud oba jeho rodiče kouřili, než když nekouřil ani jeden. U heterosexuálních mužů byl nalezen vliv na partnerské preference pouze v případě, kdy kouřila matka, u otce žádný vliv nalezen nebyl. Zatímco u homosexuálně orientovaných respondentů se ukázalo, že dávají přednost kuřákovi, pokud během jejich dětství kouřila ať už matka nebo otec. Druhá studie se zaměřila na nošení dioptrických brýlí.[23] Cílem bylo zjistit, jestli fakt, že respondentovi rodiče v době jeho dětství nosili dioptrické brýle, může ovlivnit jeho budoucí partnerské preference. Heterosexuální i homosexuální muži preferovali partnery s brýlemi méně, když oba rodiče během jejich dětství nosili brýle, než když ani jeden rodič brýle nenosil.

Jak již bylo řečeno výše, o vlivu rodičů na partnerské preference u homosexuálních jedinců je dosud známo velice málo. Zůstává tak např. otázkou, zda důležitější roli hraje rodič opačného, či stejného pohlaví. Dosavadní zjištění naznačují, že u homosexuálních mužů hraje důležitou roli spíše rodič stejného (tedy preferovaného) pohlaví.

Kvalita vztahu s rodičem během dětství

Jak významnou roli budou hrát charakteristiky rodičů na výběr partnera, závisí do značné míry na kvalitě vztahu s rodičem během dětství. Toto téma zkoumalo několik studií zaměřených na preference obličejových charakteristik. Výsledky jedné ze studií ukázaly, že ženy hodnotily jako atraktivnější muže s podobnými proporcemi obličeje, jako měl jejich otec.[24] To však platilo pouze za předpokladu, že vztah s otcem během dětství hodnotily pozitivně. Efekt podobný pozitivnímu imprintingu tak může hrát významnější roli u jedinců, kteří měli během dětství pozitivní vztah s daným rodičem. Jinými slovy se nemusí projevovat u všech jedinců do stejné míry.

V případě mužů vliv efektu podobného pozitivnímu imprintingu na výběr partnerky tak jednoznačný není. Bylo např. zjištěno, že partnerky mužů se nejvíce podobaly jejich matkám za předpokladu, že matky vůči svým synům v období dětství projevovaly více emoční vřelosti a méně je odmítaly.[25] Naopak jiná studie, byť provedená stejným výzkumným týmem, ukázala, že muži si vybírali ženy podobné svým matkám tehdy, pokud během dětství zažívali ze strany matky více odmítání. To poukazuje na skutečnost, že vztah s matkou během dětství, ať už byl výrazně pozitivní či negativní, může ovlivňovat pozdější partnerské preference mužů, zatímco u žen by mohl hrát roli vztah s otcem pouze za předpokladu, že byl kladný.

Je tedy možné, že efekt podobný imprintingu je u lidí adaptivní pouze tehdy, pokud je vztah s rodičem pozitivní. Jinými slovy, hodnotí-li jedinec retrospektivně svůj vztah s rodičem spíše kladně, pak je pravděpodobné, že by s partnerem, který se danému rodiči podobá, mohl navázat obdobně pozitivní vztah. Tento předpoklad zvyšuje šanci na udržení daného vztahu, a tím i šanci na přežití potomků. Jak však můžeme vidět z výše popsaných studií, ačkoliv je u žen toto schéma naplňováno, u mužů vliv kvality vztahy s matkou během dětství tak jednoznačnou roli nehraje. Jedním z možných vysvětlení je, že emoční podpora (tedy pozitivní vztah) ze strany rodičů může hrát větší roli pro ženy, pro které je reprodukce energeticky náročnější, a tudíž potřebují od příbuzných větší podporu.

Výše uvedené studie, které zjistily podobnost mezi některými charakteristikami rodičů a partnerů jejich potomků, však mohou mít i alternativní vysvětlení, jako je např. preference pro soběpodobnost (viz níže) či dědění preferencí. Některé studie pracující s dvojčaty zjistily, že partnerské preference jsou ovlivněny genetickými faktory z 10–30 %.[26] Na druhou stranu jiná studie zaměřená na dvojčata nenašla významný vliv rodičů na žádný ze zkoumaných znaků (např. tělesná výška, extraverze, postoje) a zrovna tak žádný genetický vliv na partnerský výběr.[27] Efekt podobný imprintingu byl podpořen i výzkumem, jehož se účastnily ženy, které byly v dětství adoptovány,[5] čímž autoři poukázali na fakt, že vliv na formování partnerských preferencí mohou mít nejen biologičtí rodiče, ale zřejmě jakákoliv pečující osoba, jak se ostatně ukazuje i u řady jiných živočišných druhů (pro přehled viz literaturu[28]).

Další možné vysvětlení podobnosti mezi rodiči a partnery potomků nabízí teorie homogamie (neboli soběpodobnosti). Podle tohoto principu lidé preferují a vybírají si takové partnery, kteří se jim podobají v základních psychických anebo fyzických charakteristikách.[29] Výsledky mnoha studií ukázaly, že partneři se vzájemně podobají např. ve věku, dosaženém vzdělání, náboženském smýšlení, v některých osobnostních či fyzických charakteristi-

kách, ale např. i v tendencích k alkoholismu nebo k psychiatrickým chorobám. Taktéž se zjistilo, že podobnější partneři spolu zůstávají déle, jsou v manželství šťastnější a mají více dětí než páry, které si jsou podobné méně.[30] Větší vzájemná podobnost v osobnostních vlastnostech, názorech, postojích atd. může totiž vést k méně konfliktům, což přispívá partnerské stabilitě. (Více o nenáhodném párování viz v kap. 11.)

Je však důležité si uvědomit, že s každým rodičem sdílíme 50 % společných variant genů neboli výběr soběpodobného partnera může být současně důsledkem toho, že partner je podobný našim rodičům. Dá se tak jen stěží přesně určit, kde leží hranice mezi tím, kdy se partner podobá nám samotným a kdy se podobá našim příbuzným. V tomto ohledu je velmi významná výše zmíněná studie s adoptovanými dcerami. Nicméně i v případě adoptovaných dětí se ukazuje, že kandidáti na adoptivní rodiče nejenže preferují spíše soběpodobné děti, ale jsou ochotni do nich více investovat.[31] Efekt podobný imprintingu je tak možné považovat za jeden z mechanismů, který vede k homogamii mezi partnery.[13]

Efekt podobný imprintingu a parafilie

Efekt podobný imprintingu může ovlivňovat nejen výběr partnera, ale je možné, že se podílí také na vzniku některých sexuálních parafilií (deviací). Podle Hanny Aronssonové[33] je internalizace neadaptivních preferencí (jako např. pro část těla či oděvu) založena na stejném mechanismu jako internalizace preferencí adaptivních (např. pro rodičovské charakteristiky). Jak zjistila již výše zmíněná studie, muži, kteří uvedli, že sexuálně preferují těhotné a kojící ženy, měli současně jednoho či více mladších sourozenců. Existuje tedy možnost, že tyto preference mohli internalizovat během svého útlého dětství. Stejně tak muži, jejichž matky nosily během jejich dětství dlouhé nehty, či ženy, jejichž otci měli např. knír, tyto rysy později hodnotili jako atraktivnější než jedinci, jejichž rodiče tyto charakteristiky neměli. Je tedy možné, že sexuální preference mohou vznikat právě prostřednictvím efektu podobného imprintingu. Ačkoli ve výše uvedeném případě nejde přímo o parafilie, u některých jedinců dochází k tak silné fixaci, že bez přítomnosti daného objektu nejsou schopni sexuálního vzrušení. Alternativní vysvětlení poskytuje teorie sexuálního podmiňování, podle níž je vznik parafilií spojen se stimulací a následnou sexuální odměnou. V případě efektu podobného imprintingu však vznik sexuální preference není podmíněn odměnou a stejně tak ji není potřeba posilovat. Dosud ovšem existuje velice málo důkazů, že by sexuální preference mohly vznikat právě prostřednictvím efektu podobného imprintingu. Není také zřejmé, proč některé specifické sexuální preference, jako jsou fetišové fixace, vznikají pouze u velmi malé části jedinců, byť vystavení se takovým objektům je mnohem běžnější. Dá se tedy očekávat, že při vzniku takových fixací musejí působit ještě další faktory (např. silný emoční zážitek spojený s daným objektem), o nichž však v současnosti můžeme pouze spekulovat.

Efekt podobný negativnímu imprintingu

Efekt podobný negativnímu imprintingu, známý také jako Westermarckův efekt, je charakterizován jako proces vytvoření si silné sexuální averze vůči těm, s nimiž jedinec vyrůstal v době raného dětství.[2] Z evolučního hlediska může efekt podobný negativnímu imprintingu fungovat jako prevence inbreedingu. Vliv Westermarckova efektu na výběr partnera byl empiricky podpořen u mnoha živočišných druhů, které vykazovaly tendence vyhýbat se párování s jedinci, s nimiž vyrůstaly. Takovéto chování bylo nalezeno např. u psouna prériového, lva a tamarína, kteří odkládají pohlavní dospělost, pokud je během dospívání přítomen jejich otec nebo bratr, či u velryb kulohlavců černých, které se reprodukují pouze s jedinci z jiných skupin.

V případě lidí bylo vytváření si sexuální averze testováno např. na Tchaj-wanu, kde jsou tradičně manželství (tzv. shim-pua) vyjednávána ještě v době, kdy jsou děti malé.[34] Rodiče předají dceru do rodiny nastávajícího manžela, v níž jsou děti následně společně vychovávány. Výzkum však ukázal, že taková manželství mají třikrát méně dětí a třikrát vyšší rozvodovost než manželství, kde spolu partneři nevyrůstali. Velmi důležitou roli hraje věk, ve kterém je dívka předána do rodiny budoucího manžela. Čím mladší dívky byly, tím měly dané páry méně dětí, častěji se rozváděly a taktéž měly častěji mimomanželské aféry.[35] K podobným závěrům dospěla i studie v izraelských kibucech, kde je zvykem, že jsou děti vychovávány společně se svými vrstevníky, tedy i potenciálními partnery.[36] Zjistilo se, že v době pohlavní dospělosti si lidé vybírají raději partnery z jiného kibucu, než ve kterém sami vyrůstali (tento jev je též znám jako tzv. kibucový efekt).

Zatímco výše zmíněné studie byly postaveny na počtu manželství uzavřených v rámci stejného či jiného kibucu, počtu dětí, rozvodovosti atd., novější studie zkoumala efekt podobný negativnímu imprintingu za pomocí interview.[37] V rámci rozhovorů byli jedinci tázáni na retrospektivní hodnocení vztahů ve skupině, jak si je pamatují z doby svého dětství, a dále jaké zažívali pocity vůči ostatním členům kibucu. Takřka žádný z respondentů neuvedl, že by vůči svým vrstevníkům zažíval sexuální averzi, naopak uváděli, že často pociťovali sexuální přitažlivost, popř. vztah k ostatním označili jako průměrný. Autoři tak uvedli, že jedinci si vůči těm, s nimiž vyrůstali, žádnou sexuální averzi nevytvářejí. Je však diskutabilní, zda retrospektivně koncipované rozhovory, které navíc byly vedeny neznámými výzkumníky, a z nich plynoucí subjektivní výpovědi, jsou dostatečně silným argumentem, aby autoři studie mohli uvést obdobný závěr, a zpochybnit tak předchozí studie založené na skutečném chování.

Westermarckovu teorii naopak podporuje studie ze Spojených států, která zjistila, že sourozenci, kteří byli v prvních šesti letech života na více než rok odděleni, měli vyšší pravděpodobnost incestního sexuálního chování.[38,39] Výzkum provedený v Maroku zase ukázal, že když jedinci spali ve stejném pokoji a byli v denním kontaktu se svým bratrancem/sestřenicí, v dospělosti vůči nim projevovali sexuální averzi.[40] V případě, že se výzkumníci zaměřili na sourozence, dospěli k odlišným závěrům u mužů a u žen. Ženy hodnotily snímky podobající se jejich sourozencům jako méně atraktivní než snímky průměrné, zatímco u mužů byl nalezen zcela opačný efekt. Skutečnost, že byl tento efekt nalezen pouze u žen, může být vysvětlena z pohledu teorie investic, kdy náklady žen na reprodukci (těhotenství, laktace atd.) jsou výrazně vyšší než investice mužů. Právě proto, že následky inbreedního párování mohou mít vyšší negativní dopad u žen, je možné, že jsou k tomuto způsobu párování citlivější. (Více o teorii investic viz v kap. 11.)

ZÁVĚR

Celá řada výzkumů poukazuje na to, že rodinní příslušníci či jiní blízcí jedinci hrají poměrně důležitou roli při formování partnerských preferencí. V této kapitole jsme se v komparativní perspektivě zaměřili především na sexuální imprinting a jemu podobný efekt. Prostřednictvím tohoto mechanismu může docházet k internalizaci charakteristik blízkých osob, které později jedinec preferuje u budoucích partnerů. Současně může dojít k vytvoření sexuální averze vůči konkrétním jedincům, s nimiž vyrůstal. Klíčovou otázkou však stále zůstává, zda je relevantní o sexuálním imprintingu uvažovat u člověka. Z původní definice imprintingu vyplývá, že k vtištění charakteristik rodinných příslušníků může dojít výhradně během senzitivní periody, přičemž tento efekt je už zcela nezvratitelný. Jak ovšem ukázaly pozdější výzkumy na různých živočišných druzích, tato definice je nepřiměřeně rigidní. V případě člověka nebylo načasování senzitivní periody zjištěno, a proto je otázkou, zda u něj vůbec toto specifické období zvýšené citlivosti existuje. Stejně tak nebyla potvrzena ani nezvratitelnost naučených charakteristik. Z těchto důvodů se ve studiích zaměřených na lidi používá spíše pojem efekt podobný imprintingu, který na jedné straně poukazuje na podobnost s původním konceptem (tedy učení se charakteristik rodinných příslušníků a jejich následná preference/vyhýbání se), ale na straně druhé dostatečně zdůrazňuje rozdíl s ohledem na výrazně vyšší flexibilitu daného mechanismu u člověka. Neopomenutelný význam v efektu podobném imprintingu hraje vztah s rodiči. Studie ve valné většině případů zjistily, že kladný vztah s rodiči během dětství pozitivně predikuje podobnost rodiče s partnerem ve vybraných psychických a fyzických charakteristikách. Tato skutečnost napovídá, že spíše než klasická forma sexuálního imprintingu rodičovský vliv modifikuje i některá z forem asociativního učení. Zatímco k vtištění charakteristik (v případě sexuálního imprintingu) je potřeba poměrně krátká a leckdy jednorázová expozice, k internalizaci (v případě imprintingu podobného efektu) může docházet postupným učením, které je upevňováno a modifikováno na základě kvality vztahu s daným rodinným příslušníkem. Vliv rodičů a jiných blízkých osob na výběr partnera je bezesporu velice komplexní téma a celá řada otázek stále zůstává otevřená. Máme např. poměrně kusé znalosti o tom, v jakém věku se formuje vliv rodičů na partnerské preference. Dále není zřejmá stabilita takových preferencí a zda dochází k jejich modifikaci např. v důsledku negativní zkušenosti s předešlým partnerem. V neposlední řadě bychom neměli zapomínat, že efekt rodičů nemusí být specifický pouze pro partnerské preference, ale může jít o obecnější vliv na afiliativní sociální interakce, jehož jsou partnerské vztahy podmnožinou. Všechny tyto otevřené otázky naznačují, že v oblasti sexuálního imprintingu a jemu podobných fenoménů můžeme v nejbližších letech očekávat celou řadu vysoce zajímavých zjištění.

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Příloha III

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Assortative mating in personality among heterosexual and male homosexual couples from Brazil and the Czech Republic

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ABSTRACT

Studies of homogamy in personality in heterosexual couples have arrived at inconsistent results and research of this issue in same-sex couples is almost non-existent. Moreover, homogamy in actual couples can differ from preferred homogamy in ideal partners. In Study 1, preferences for personality homogamy and perceived homogamy in actual relationships as measured by a Ten-Item Personality Inventory were assessed in heterosexual and homosexual men from Brazil and the Czech Republic. In men of both sexual orientations, we found preferences for homogamy in all personality characteristics except for Emotional Stability, while perceived homogamy in actual couples was limited to Extraversion in heterosexual couples. The results were nearly identical for both studied populations.

In Study 2, resemblance in the Big Five personality traits measured by a 60-item NEO-FFI was tested in 49 actual heterosexual and 40 male same-sex long-term couples from the Czech Republic. Heterosexual partners resembled each other in Extraversion, Openness, and Conscientiousness, whereas homosexuals only in Extraversion. Our results thus indicate that while preferences for personality homogamy exist in both heterosexual and homosexual men, they translate only partially into actual mate choice, especially in homosexual men.

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1. Introduction

It is a well-established fact that human mate preferences and mate choice are far from random. One of the most widespread theories states that people tend to prefer and choose partners based on self-similarity (homogamy), and/or dissimilarity (heterogamy). This mechanism is also known as positive/negative assortative mating (Vandenberg, 1972). Previous research reports that long-term heterosexual partners show some degree of similarity in many of the characteristics studied: they resemble each other in various demographic characteristics (such as age or social status), physical appearance (e.g., body height, hair colour), and attitudes (e.g., political orientation and religiosity) (for a review see, Štěrbová & Valentová, 2012).

Some research suggests that spousal similarity might contribute to relationship quality. It has been reported that opposite-sex partners who are more similar in a variety of characteristics, such as age, educational level, socioeconomic status, intelligence, attitudes, and physical attractiveness, tend to perceive their relationships as happier, have more children and a lower likelihood of separation than less similar couples (e.g., Arrindell & Luteijn, 2000; Bereczkei & Csanaky, 1996; Bouchard, Lussier, & Sabourin, 1999). Homosexual individuals also express a higher level of relationship satisfaction when they share similar values and beliefs (Kurdek & Schmitt, 1987). When it comes to personality characteristics, however, heterosexual couple similarity consistently explains <0.5% of variance in relationship satisfaction (Dyrenforth, Kashy, Donnellan, & Lucas, 2010).

A substantial body of research conducted mostly in North American and European countries has shown that heterosexual partners score similarly on some of the Big Five personality dimensions. The observed pattern, however, varies highly across the individual studies. Some found spousal homogamy in Conscientiousness, Openness, and Agreeableness (e.g., McCrae & Costa, 1987; Rammstedt & Schupp, 2008), while another study (Botwin, Buss, & Shackelford, 1997) reports homogamy in Conscientiousness and Openness, but not in Agreeableness. Homogamy in Openness and Extraversion has also been observed by Gyuris, Járai, and Bereczkei (2010). Other studies, however, found personality homogamy only in Extraversion (e.g., Keller, Thiessen, &

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Young, 1996; Little, Burt, & Perrett, 2006), while yet other research failed to find evidence of homogamy in any of the personality characteristics studied (e.g., Gyuris, Bernáth, & Bereczkei, 2005). Neuroticism is the only personality factor in which similarity has not been observed.

These discrepancies may be partly due to differences in methodology, such as the use of different personality measures or computations of self-similarity (Kenny, Kashy, & Cook, 2006; Luo & Klohnen, 2005). Moreover, actual mate choice is limited by many external and internal factors, such as availability of a potential partner or own mate value (e.g., Regan, 1998). Also, homogamy in actual couples is due to several distinct mechanisms (for a review, see Štěrbová & Valentová, 2012). Active assortment, i.e., preferences for self-similarity, is considered one of the primary mechanisms at work (Kalmijn, 1998). So far, it has been shown that people tend to prefer partners who are similar to themselves in Openness and Conscientiousness (Botwin et al., 1997) and along the same line, Figueredo, Sefcek, and Jones (2006) found preferences for self-similarity in all the Big Five personality traits, but most notably in Openness. Only a handful of studies have investigated both preferred and actual homogamy in the same sample in order to ascertain whether active assortment is associated with similarity between actual partners. Thus far, two studies found that preferred homogamy correlates with actual homogamy between partners in Conscientiousness and Neuroticism (Botwin et al., 1997; Watson, Beer, & McDade-Montez, 2014) but on the other hand, Figueredo et al. (2006) did not find any correlation between preferred and actual homogamy in any of the Big Five personality traits.

Vast majority of previous research on actual and preferred homogamy focused on heterosexual individuals or couples. As far as we know, the only study which dealt with same-sex male partners did not find any homogamy in the Big Five personality characteristics (Gyuris et al., 2005). Other studies have shown that same-sex male partners tend to resemble each other in age and education level, but to a smaller degree than opposite-sex couples (Andersson, Noack, Seierstad, & Weedon-Fekjaer, 2006; Jepsen & Jepsen, 2002; Schwartz & Graff, 2009; Verbakel & Kalmijn, 2014). To the best of our knowledge, there are currently no other studies on preferences for self-similar personality characteristics in homosexual individuals, although it has been shown that homosexual men prefer potential partners who are close to them in age (Harry & DeVall, 1978) and resemble them in terms of height (Valentova, Stulp, Třebický, & Havlíček, 2014; Valentova, Bártová, Štěrbová & Varella, 2016), beardedness (Valentova, Varella, Bártová, Štěrbová, & Dixson, 2017), and masculinity (Bailey, Kim, Hills, & Linsenmeier, 1997).

Moreover, homosexual individuals offer a unique opportunity to study differences both within and between the sexes. Previous studies have shown small to moderate differences in self-assessed personality between men and women, in particular in Agreeableness and Neuroticism (for a meta-analysis, see Lippa, 2005). Somewhat similarly to heterosexual women, homosexual men reported higher scores in Agreeableness, Neuroticism, Conscientiousness, and Openness than heterosexual men (Lippa, 2005, 2008). Along the same line, a recent cross-cultural study reported higher self-assessed Conscientiousness and Neuroticism in homosexual than in heterosexual men (Valentova, Štěrbová, Bártová, & Varella, 2016) and in the same study, homosexual men have also shown higher preferences for Conscientiousness in their ideal partner than heterosexual men did. These intra-sexual differences in self-reported and preferred personality traits could lead to differences in results for heterosexual and homosexual individuals also in preferred and actual personality homogamy. In particular, the 'mating market' of homosexual individuals is considerably smaller, which might complicate the finding of a preferred partner (McFarland, 1975). Thus, same-sex couples could display lower homogamy level than opposite-sex couples. Therefore, in order to shed light on between- and within-sex variation in preferred and actual homogamy, it is important to compare individuals who prefer same-sex partners with individuals who prefer partners of the opposite sex.

1.1. Current research

The general aim of our study was to test preferred and perceived/actual homogamy in personality in heterosexual and homosexual men from Brazil and the Czech Republic. In other words, we tested whether preferred and actual partners of heterosexual and homosexual men are more self-similar than randomly paired individuals from a given sample.

In Study 1, we examined whether heterosexual and homosexual men prefer partners with self-similar personality characteristics and whether these preferences translate into actual mate choices. A previous study had shown that in both heterosexual and homosexual individuals, preferences for personality differ from the reported personality of actual partners (Valentova et al., 2016). This may be because actual mate choice is more limited by various constrains than mate preferences. Furthermore, if actual homogamy between partners results primarily from preferences for self-similarity, one might expect that the degree of preferred homogamy in an ideal partner would be higher than perceived homogamy in the actual partners.

Moreover, it has not yet been tested whether preferences for homogamy vary between single and coupled individuals. It has been previously shown that coupled people tend to overestimate the actual similarity with their partner (Buunk & Bosman, 1986; Klohnen & Bera, 1998), which may, in turn, affect their preferences. Therefore, we have tested preferences for homogamy in singles and coupled participants separately.

In order to test whether preferred and actual homogamy can be generalised across different cultures, we employed samples from populations which tend to be underrepresented in psychological research. Participants in Study 1 were recruited from Brazil and the Czech Republic. The two countries differ substantially in terms of history, culture, and socio-demographic data. Brazil is with its 203 million inhabitants the largest country in Latin America (Brazil Demographics Profile, 2014), while the Czech Republic is a small Central European state with a population of approximately 10.6 million inhabitants (Czech Statistical Office, 2015). The GDP per capita in Brazil is $15,800, which is significantly less than the $31,500 in the Czech Republic (Central Intelligence Agency, 2015). In terms of legislation, Brazil is liberal on the issue of same-sex couples, currently allowing full marriages and the adoption of children. The Czech Republic is also considered legislatively liberal and same-sex couples can enter civil unions. On the other hand, as far as public acceptance of homosexuality is concerned, only 60% of Brazilian population expressed support, whereas in the Czech Republic 80% of population report acceptance of homosexuality (The Global Divide on Homosexuality, 2013). Based on previous research (e.g., Heine, Foster, & Spina, 2009), we expected cross-cultural consistency in preferences for homogamy, while actual homogamy can vary across cultures due to factors such as relational mobility and the opportunity to form a relationship (Schug, Yuki, Horikawa, & Takemura, 2009). In particular, we hypothesised that both heterosexual and homosexual men would exhibit preferences for self-similarity in all the Big Five personality characteristics except for Emotional Stability (i.e., low Neuroticism). In the same vein, we expected that actual couples would tend to be rather similar in all personality characteristics with the exception of Emotional Stability.

The main aim of Study 2, which employed a sample from the Czech Republic, was to determine whether personality characteristics of male respondents resemble those of their long-term opposite-sex or same-sex partners. To test actual homogamy in couples, both partners were recruited to participate in the study.

As mentioned above, previous research on homogamy focused almost exclusively on opposite-sex couples, and thus little is known about assortative mating in homosexual individuals. For both our studies, we have thus recruited both heterosexual and homosexual men.

2. Study 1

2.1. Materials and methods

2.1.1. Participants

Participants were recruited through social media and from a pool of previous respondents at the Univeristy of Brasilia, the University of São Paulo, and the Charles University, Prague. Only participants over 18 years were allowed to take part in the study. To make the study comparable with Study 2, only participants of 18 to 40 years of age and those identified as predominantly heterosexual or predominantly homosexual were included in the final analysis. A total of 678 men participated in the study; 156 were excluded from the analysis (43 were over 40, 21 had categorised themselves as bisexual, and 92 failed to complete the questionnaires). A total of 282 heterosexual men were thus included in the study: 165 from Brazil (mean age = 25.95 years, $SD = 4.57$, range 19–38) and 117 from the Czech Republic (mean age = 28.41 years, $SD = 5.02$, range 19–40). A total of 240 homosexual men were included in the study: 119 from Brazil (mean age = 24.70 years, $SD = 4.15$, range 19–38) and 121 from the Czech Republic (mean age = 28.0 years, $SD = 5.39$, range 19–40).

The mean relationship length for Brazilian heterosexual participants (N = 100) was 46.87 months (median = 35, $SD = 40.96$, range 2–195), while for the Brazilian homosexual participants (N = 53) it was 22.91 months (median = 19.00, $SD = 17.01$, range 2–63). The mean relationship length for Czech heterosexual participants (N = 64) was 53.16 months (median = 33, $SD = 49.87$, range 1–211), whereas for the Czech homosexual participants (N = 76) it was 40.59 months (median = 27.50, $SD = 38.55$, range 2–182). In general, heterosexual participants reported longer relationships than homosexual participants ($t(291) = 3.43$, $p = 0.001$), and Czech participants reported longer relationships than Brazilian participants ($t(305) = 1.98$, $p = 0.004$). When only individuals who had been in a relationship for over 12 months were included in the analysis, the results were essentially identical. In the following, we report results on the whole sample.

2.1.2. Measures

All respondents indicated their sexual orientation on the 7-point Kinsey scale (ranges from 0 = '*exclusively heterosexual*' to 6 = '*exclusively homosexual*'). Participants who categorised themselves on positions 0 or 1 were considered predominantly heterosexual, those who categorised themselves on positions 5 or 6 were considered predominantly homosexual, while those who categorised themselves on positions 2, 3, or 4 were excluded from the final analysis.

Each participant was asked to assess personality characteristics by completing the Ten-Item Personality Inventory (TIPI) (Gosling, Rentfrow, & Swann, 2003). A score in each of the Big Five domains (Emotional Stability, Extraversion, Openness, Agreeableness, and Conscientiousness) consists of the sum of the two items. Responses for each item are given on a 7-point Likert scale, which ranges from '*strongly disagree*' to '*strongly agree*'. For the Brazilian sample, we used a Brazilian Portuguese version (de Francisco Carvalho, Nunes, Primi, & da Silva Nunes, 2012). For the Czech sample, we translated the questionnaire by a method of translation and back-translation into the Czech language. Each participant completed a questionnaire i) about his own characteristics, ii) his preferred partner, and iii) his long-term partner where applicable. In this study, only perceived homogamy (i.e., correlation between self-reports and reports about the partner) was assessed, because only one of the partners participated. The order of questionnaire sets was randomised.

2.1.3. Procedure

Participants were informed about the general research aims before providing informed consent. Questionnaires were then completed anonymously online using the Qualtrics software (2009) for online data collection. This study is one of the main outcomes of a larger project on partner preferences (e.g., Valentova, Štěrbová et al., 2016; Valentova, Varella et al., 2017). Participants completed a set of other questionnaires and measures and the whole procedure therefore took around 40 min. Respondents were not remunerated for their participation.

2.1.4. Statistical analysis

All analyses were carried out in SPSS 21.0 (IBM Corp.). In order to determine whether the preferred or actual partners were more alike in their personality characteristics (TIPI dimensions) than randomly paired individuals from the sample, intraclass correlations for unordered couples were run using the SPSS' Reliability Analysis feature. Cronbach's Alpha one-way random model was employed.

We then compared intraclass correlation coefficients between the two populations, between heterosexual and homosexual men, and between coupled and single men. Analyses follow a procedure suggested by Haggard (1958 in Kenny et al., 2006). First, we transformed the intraclass correlations using Fisher's z transformation. The standard error of difference between the two transformed correlations was the square root of $1 / (n1 - 2) + 1 / (n2 - 2)$, where n1 and n2 refer to the number of dyads in each of the two subgroups. Then, we computed z as a difference between the two intraclass correlations divided by the standard error of the difference, and looked up its associated p-value. Comparisons of intraclass correlations between single and coupled respondents did not reveal any significant differences, which is why we report the results for single and coupled respondents together. Similarly, when broken down into individual populations, the groups showed virtually no differences. Results for the Brazilian and the Czech sample are therefore also reported together.

2.2. Results

Heterosexual as well as homosexual men preferred self-similarity in Extraversion, Openness, Agreeableness, and Conscientiousness in their preferred female and male partners, respectively. Heterosexual and homosexual men thus preferred self-similar partners in all the Big Five characteristics with the exception of Emotional Stability (Table 1).

Further, heterosexual men reported a higher level of perceived similarity in Extraversion with their actual female partners than individuals paired at random. In homosexual participants, similarity was not significant in any of the tested Big Five characteristics (Table 1).

Finally, we compared intraclass correlation coefficients between preferred and perceived similarity in coupled respondents. Results had shown that the preferred (i.e., respondent and preferred partner) and the perceived (i.e., respondent and actual partner) similarity in heterosexuals significantly differed in Openness and Conscientiousness, while in homosexuals, significant differences were found in all the Big Five characteristics (for detailed results, see Table 2).

3. Study 2

3.1. Materials and methods

3.1.1. Participants

A total of 89 long-term couples participated in the study, 49 of them heterosexual. The criteria for participation were: i) age between 18 and 40 years and ii) being in a 'long-term romantic relationship that is viewed as having a promising outlook'. The mean age of the heterosexual male respondents and their female partners was 25.84 years ($SD = 4.54$, range 19–36) and 23.65 years ($SD = 2.65$, range 18–30), respectively. The mean relationship length was 41.96 months (median = 36, $SD = 31.57$, range 4–135).

Forty male homosexual long-term couples also participated in the study. The mean age of homosexual male respondents was 25.78 years ($SD = 5.21$, range 18–39). The mean relationship length was 32.31 months (median 22, $SD = 28.02$ range 3–116). An

Table 1
Study I: Intraclass correlations (ICC) and 95% confidence intervals (CI) in personality characteristics between respondents and ideal (preferred) and actual (perceived) partners (Brazilian and Czech sample together).

Variable	Heterosexual men				Homosexual men			
	Preferred similarity (N = 282)		Perceived similarity (N = 165)		Preferred similarity (N = 240)		Perceived similarity (N = 129)	
	ICC	95% CI	ICC	95% CI	ICC	95% CI	ICC	95% CI
Emotional Stability	−0.04	[−0.16, 0.08]	−0.10	[−0.25, 0.05]	−0.22	[−0.34, −0.01]	−0.11	[−0.28, 0.07]
Extraversion	**0.37*****	[0.27, 0.47]	**0.29*****	[0.14, 0.42]	**0.29*****	[0.17, 0.40]	−0.001	[−0.17, 0.17]
Openness	**0.43*****	[0.33, 0.52]	0.10	[−0.05, 0.25]	**0.38*****	[0.27, 0.48]	−0.04	[−0.21, 0.13]
Agreeableness	**0.14****	[0.03, 0.26]	0.03	[−0.12, 0.19]	**0.25*****	[0.13, 0.37]	0.03	[−0.14, 0.20]
Conscientiousness	**0.27*****	[0.16, 0.37]	−0.06	[−0.21, 0.10]	**0.37*****	[0.26, 0.48]	0.06	[−0.11, 0.23]

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

independent samples *t*-test showed that heterosexual and homosexual men did not significantly differ in either age ($t(126) = 0.058$, $p = 0.954$) or relationship length ($t(87) = 1.51$, $p = 0.135$).

All participants were recruited through social media, LGBT websites and organizations, and from a pool of previous respondents at the Charles University, Prague.

3.1.2. Measures

All respondents indicated their sexual orientation on the 7-point Kinsey scale, which ranges from 0 = '*exclusively heterosexual*' to 6 = '*exclusively homosexual*'. All participants in a heterosexual relationship categorised themselves as a 0 or 1, while those in a homosexual relationship chose a 5 or 6.

For the assessment of personality characteristics, we used a Czech version of the 60-item Big Five Inventory NEO-FFI (Costa & McCrae, 1992; Hřebíčková, 2004). This inventory consists of 5 dimensions (Emotional Stability, Extraversion, Openness, Agreeableness, and Conscientiousness), each comprised of 12 items. Respondents answer each item using a 5-point Likert scale ranging from 1 = '*disagree strongly*' to 5 = '*agree strongly*'. Each participant and his partner completed the NEO-FFI for themselves. Based on this information, we were able to estimate the actual homogamy of each couple.

3.1.3. Procedure

Participants were informed about the general research aims before providing informed consent. Questionnaires were then completed using the Qualtrics (2009) software for online data collection. The study was one of the main parts of a larger project on homogamy and sexual imprinting-like effect (e.g., Bártová et al., 2017). Participants completed a set of other questionnaires and measures and the whole procedure therefore took around 40 min. Each couple was reimbursed for their time with an equivalent of 10 USD.

Table 2
Study I: Comparison of Intraclass correlations coefficients in personality characteristics in preferred vs. perceived similarity in coupled respondents.

Variable	Heterosexual (N = 164)		Homosexual (N = 128)	
	SE	Z	SE	Z
Emotional Stability	0.11	0.54	0.11	**2.01***
Extraversion	0.11	1.26	0.11	**2.72****
Openness	0.11	**2.75****	0.11	**3.52*****
Agreeableness	0.11	1.29	0.11	**2.21***
Conscientiousness	0.11	**3.20****	0.11	**2.40***

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

3.1.4. Analysis

All analyses were carried out using SPSS 21.0 (IBM Corp.). In order to determine whether partners resemble each other in their psychological (NEO-FFI dimension) characteristics to a greater degree than individuals from the sample paired at random, intraclass correlations for unordered couples were run using the SPSS' Reliability Analysis feature. Cronbach's Alpha one-way random model was employed. Consequently, following the same method as described in Study 1, we compared intraclass correlation coefficients between heterosexual and homosexual men.

3.2. Results

In comparison to individuals paired at random, heterosexual partners were significantly more alike on the NEO-FFI dimensions of Extraversion, Openness, and Conscientiousness. Homosexual partners, on the other hand, were more alike than individuals paired at random only in Extraversion (for a complete overview, see Table 3).

Further, we compared the intraclass correlation coefficients of opposite-sex couples with those of same-sex couples. Results showed that the level of actual homogamy in opposite-sex and same-sex couples does not significantly differ (all $p > 0.05$) in any of the examined characteristics.

4. General discussion

The main goal of the present study was to examine the level of similarity in personality between self and preferred/actual partners in heterosexual and homosexual men from Brazil and the Czech Republic. Our data yielded two key results: First, heterosexual and homosexual men from the both studied populations unambiguously preferred self-similarity in all of the personality characteristics followed by our study with the exception of Emotional Stability. Perceived/actual homogamy

Table 3
Study II: Intraclass correlations in personality characteristics between respondents and their actual partners.

Variable	Heterosexual men (N = 49)		Homosexual men (N = 40)	
	Actual similarity		Actual similarity	
	ICC	95% CI	ICC	95% CI
Emotional Stability	0.07	[−0.21, 0.35]	0.22	[−0.09, 0.49]
Extraversion	**0.35****	[0.08, 0.57]	**0.47****	[0.19, 0.68]
Openness	**0.27***	[−0.01, 0.51]	0.16	[−0.16, 0.44]
Agreeableness	0.05	[−0.23, 0.32]	0.21	[−0.11, 0.48]
Conscientiousness	**0.49*****	[0.25, 0.68]	0.15	[−0.16, 44]

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

between partners was, however, lower than the preferred one. Study 2 showed a higher actual homogamy in heterosexual (Extraversion, Openness, and Conscientiousness) than in male homosexual (Extraversion) long-term couples.

The main result supports the universality of preferences for self-similarity (Botwin et al., 1997; Figueredo et al., 2006) by demonstrating that both heterosexual and homosexual, Brazilian and Czech, coupled and single male participants express preferences for partners with a self-similar personality. More specifically, heterosexual and homosexual men from both studied populations unambiguously preferred self-similarity in most personality characteristics, which is consistent with previous research (e.g., Figueredo et al., 2006). This finding supports the suggestion that preferences for homogamy are part of the evolved mating psychological mechanisms.

Despite systematic preferences for homogamy in almost all personality characteristics, homogamy in actual couples was restricted to Extraversion, Openness, and Conscientiousness, and in the last two, homogamy was only found in heterosexual couples in Study 2. In this respect, our results are consistent with several previous studies (e.g., Botwin et al., 1997; Gyuris et al., 2010; Little et al., 2006). Furthermore, neither of our studies found spousal homogamy in Emotional Stability or Agreeableness. To the best of our knowledge, no study so far found couple homogamy in Emotional Stability, but homogamy in Agreeableness has been reported before (e.g., Rammstedt & Schupp, 2008).

Overall, we found that perceived/actual homogamy between partners was lower than the preferred one. It thus seems that although individuals express preferences for partners with self-similar personality, they actually form couples with partners who match their own personalities to a lesser degree. These results are consistent with previous research which showed that partner preferences differ from actual partner choice (e.g., Courtiol, Picq, Godelle, Raymond, & Ferdy, 2010; Dijkstra & Barelds, 2008; Figueredo et al., 2006). Actual choices require mutual agreement and are influenced by many other traits, such as physical attractiveness, education level, or socio-economic status. They also depend on the bargaining power of the individual in the 'mating market', on the opinions of important others, such as family members and friends (see Apostolou, 2007), and a comparison with alternative available partners.

Finally, both studies found significant similarities more frequently in heterosexual partners than in male homosexual partners. According to a widespread stereotype, partners in same-sex couples tend to be heterogamous, especially in the masculinity–femininity dimension (Peplau & Cochran, 1990). Nonetheless, previous research (Bailey et al., 1997; Bártová et al., 2017; Kurdek & Schmitt, 1987) as well as our results indicate that this preconception may be inaccurate. We found that male same-sex couples did not exhibit a significant level of homogamy or heterogamy in personality traits. Moreover, previous studies found a lower level of similarity in homosexual than in heterosexual couples regarding their educational level and age (Andersson et al., 2006; Jepsen & Jepsen, 2002; Schwartz & Graff, 2009; Verbakel & Kalmijn, 2014), and no homogamy in personality (Gyuris et al., 2005). This might be explained by differences in the number of potential partners, or the size of the 'mating market' (McFarland, 1975). The chance of finding a homogamous partner increases with the absolute size of the 'mating market'. Since homosexual individuals have considerably less opportunities to find a long-term partner than heterosexuals, it is consequently more difficult for homosexual persons to find a desired self-similar partner (Blau & Schwartz, 1997). A further explanation can be social acceptance of homosexuality, which varies across as well as within societies, and can further limit the opportunities for meeting a potential partner in common settings (such as workplace, school etc.) (Blumstein & Schwartz, 1983). Alternatively, when choosing a long-term partner, characteristics other than personality similarity, for instance similar values, could be more decisive for homosexual men (Kurdek, 1991).

Furthermore, it is well known that women are on average more selective in terms of sexual and romantic partners (e.g., Fletcher, Kerr, Li, & Valentine, 2014; Valentova et al., 2016). They might thus steer the actual mating decisions of heterosexual couples, which would result in a higher homogamy in heterosexual as opposed to homosexual couples. On the other hand, male-male couples do not face the limitations required by women, and their actual mating decisions can thus be more independent of their ideal preferences. Moreover, the length of male-male relationships in our study was shorter than the duration of male-female relationships. Higher couple similarity in heterosexual couples may thus also be a consequence of convergence, i.e., it may be due to the fact that partners became more alike over time (e.g., Zajonc, Adelmann, Murphy, Niedenthal, & Niedenthal, 1987). For instance, Little et al. (2006) reported a higher similarity in perceived personality traits in couples who had been together for a longer period of time. Longitudinal research, on the other hand, does not support the hypothesis that couples increasingly resemble each other over time, which implies that mate preferences may have a stronger effect than convergence (Caspi, Herbener, & Ozer, 1992).

To the best of our knowledge, no previous study has focused on preferred and perceived similarity in personality in different populations. Interestingly, we found hardly any significant differences between the Brazilian and Czech men in either preferred or perceived similarity in personality. Personality preferences and choices, on the other hand, were found to be partly influenced by the distribution of a given personality characteristic in the population in question (Valentova et al., 2016). This suggests that absolute preferences for personality may be modulated by culture. Moreover, it is also possible that relative preferences and choices (homogamy) regarding personality characteristics follow a more general pattern. Furthermore, the preferred homogamy in personality did not vary depending on a relationship status, which indicates that coupled individuals do not adjust their preferences for similarity according to their current partner.

From a methodological perspective, a distinction should be made between the perceived and the actual homogamy. It has been shown that actual homogamy (i.e., the correlation between partners' self-reports) and perceived homogamy (i.e., the correlation between self-reports and reports about the partner) can lead to discrepant results. Perceived similarity has been conceptualised by Morry's attraction–similarity model, which proposes that attraction can lead to a perception of greater similarity between spouses (Morry, 2005). It has been suggested that a *belief* in partner's similarity predicts attraction and this holds regardless of any actual similarity between partners (e.g., Condon & Crano, 1988; Hoyle, 1993; Newcomb, 1963). People often believe their spouses to be more self-similar than they actually are (Buunk & Bosman, 1986; Klohnen & Bera, 1998). Interestingly, in Study 2 we found actual homogamy in more characteristics than in the perceived homogamy in both the heterosexual and homosexual individuals in Study 1. Nevertheless, since the two studies used different personality measures, any direct comparisons should be treated with caution.

The main limitation of the current study is that it has focused primarily on heterosexual and homosexual men, and the female preferences were not considered. A previous study aimed at assortative mating in personality had shown than heterosexual and non-heterosexual men and women differ in their preferences, actual choice, and discrepancy between preferred and actual partners' personality (Valentova, et al., 2016). We may therefore expect some gender differences in homogamy as well. Future studies should thus also focus on heterosexual and homosexual women. It also needs to be taken into account that the sample size of Study 2 was relatively small – its strong point is, however, that both the partners participated in the study. We were thus able to analyse answers from the both partners and not only reports from one of them, as is usual in similar studies.

To conclude, our study has shown that men prefer partners who exhibit personality characteristics similar to their own. This applies to both heterosexual and homosexual men, from both the Brazilian and the Czech population. It suggests that active assortment is a more general phenomenon, independent of sexual orientation and/or particular population. On the other hand, preferences are considerably more homogamous than the assortment in actual couples. Preferences can thus reflect

the desired characteristics in potential partners independently of the limiting factors, such as the size of the 'mating market' or one's mate value. Moreover, studies of homogamy in personality may possibly have some practical implications. A meta-analysis of the issue has indicated that spousal similarity in personality factors has relatively little impact on relationship functioning (Dyrenforth et al., 2010). Instead of stressing individual preferences for self-similarity in personality, couple counsellors but also for instance online 'lonely hearts' companies might focus on some more influential aspects of relationship quality, such as similarity in values and activities.

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Příloha IV

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ORIGINAL PAPER

Homogamy in Masculinity–Femininity Is Positively Linked to Relationship Quality in Gay Male Couples from the Czech Republic

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Abstract The main aims of this research were to test the similarity of masculinity–femininity in long-term male same-sex couples from the Czech Republic and to examine whether this similarity predicts higher relationship quality. In Study 1, participants ($N = 30$) and their partners completed the Dyadic Adjustment Scale (DAS) and the Childhood Gender Nonconformity Scale (CGN). In Study 2, participants ($N = 40$) and their partners completed DAS and the Gender Diagnosticity Scale (GD). Results showed that the partners were no more alike than individuals paired at random in their CGN or GD, but greater similarity in CGN between partners increased Dyadic Cohesion ($r = -.41$ [$-.71$, $-.02$]) and Affectional Expression ($r = -.38$ [$-.60$, $-.13$]). Our results add to previous evidence showing that similarity in same-sex couples increased relationship quality. Although, on average, gay men were not coupled on the basis of homogamy in gender roles, their relationship quality is linked to the gender egalitarian model rather than to the gender stratified one. Thus, a widespread stereotype suggesting that same-sex partners are divided by different gender roles seems to be, at least in our sample from a Western society, rather incorrect.

Keywords Male same-sex couples · Relationship quality · Assortative mating · Gender roles · Sexual orientation

Introduction

Two main theories have been postulated about the specific mechanisms that play a key role in mate choice—the theory of homogamy (positive assortative mating) and the theory of complementarity (negative assortative mating) (Štěrbová & Valentová, 2012). Most of the recent studies have focused on assortment in heterosexual individuals, but fewer studies have focused on the preference and real choice of gay individuals.

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Homogamy or Positive Assortative Mating

Although originally used, in particular, for plant breeding, Partridge (1983, cited by Penton-Voak, Perrett, & Peirce, 1999) defined homogamy as a matching pattern, which applies to situations when the partners' phenotypes are more similar to each other than to that of any random individual in the given population. Thus, the concept of homogamy refers beyond marriage to the mate choice of individuals who have similar characteristics, with active assortative mating meaning preferences for homogamy. These characteristics can be of any type, such as social, behavioral, psychological, or physical.

The tendency for individuals to choose a partner similar to themselves in various characteristics has been supported by many studies. For example, partners are more similar to each other than random individuals in the level of education, political orientation (Watson et al., 2004), age (Esteve, Cortina, & Cabre, 2009; Watson et al., 2004), religiousness (Kalmijn, de Graaf, & Janssen, 2005), or ethnicity (Freeman, 1955). In addition to physical appearance, partners tend to be homogamous in perceived attractiveness (Little, Burt, & Perrett, 2006), facial symmetry (Burriss, Roberts, Welling, Puts, & Little, 2011), and other facial attributes (Bovet, Barthes, Durand, Raymond, & Alvergne, 2012). Further, it has been found that partners were more similar to each other in intelligence and cognitive abilities (Watson et al., 2004). In personality characteristics, partners are alike in Openness and Agreeableness (McCrae et al., 2008), Extraversion, Conscientiousness (Gyuris, Járai, & Bereczkei, 2010), and also in some psychiatric disorders (e.g., major depressive disorder; Maes et al., 1998). Importantly, Caspi, Herbener, and Ozer (1992) found that long-term partners resembled each other in personality traits after the first year as well as after 20 years of marriage. Thus, similarity between spouses is probably not solely a result of cohabitation.

Previous research showed that individuals not only bond in a homogamous way, but the level of homogamy also influences relationship quality. Indeed, partners who are more similar have longer-lasting relationships, are happier, and have more children than couples in which the partners are less similar (Bereczkei & Csanaky, 1996; Thiessen, Young, & Delgado, 1997). Individuals of similar personality characteristics, values, and beliefs tend to have a similar world view and way of thinking, which leads to a reduced number of partner arguments and conflicts and thus increases relationship satisfaction (Byrne, 1971, cited by Klohnen & Luo, 2003).

Complementarity in Personality Traits

The theory of complementarity suggests that individuals prefer and choose partners with features and characteristics that are opposite to their own, and are thus supposed to complement each other. Winch, Ktsanes, and Ktsanes (1954) postulated a complementary needs hypothesis, suggesting that individuals seek partners with characteristics which are different from their own but yet interrelate (e.g., dominance–submissiveness or nurturance–receptivity), because these combinations are gratifying. Such differences in personality and interpersonal traits can facilitate cooperation between partners. According to Smith and Ruiz (2007), complementarity in social interactions and in particular the dimension of interpersonal control is very important and may increase the level of partnership satisfaction, such that a submissive person will interact with a dominant individual without conflict. Following this reasoning, Dryer and Horowitz (1997) found that complementarity in dominance and submissiveness can play an important role in relationship dynamics, although similarity in the hierarchy dimension between individuals does not lead to greater discontent. However, it has been shown that relationships in which partners show dissimilarity in personality traits and physical characteristics are less stable and have a shorter duration (Felmlee, 2001). It has been pointed out that relationships established on complementarity mostly fail to lead to long-term partnerships and are ended earlier than relationships based on homogamy. According to Felmlee (2001), the complementary features at the beginning of the partnership were considered as attractive (e.g., successful, laid-back, or nice), but have come to be perceived negatively in the course of the relationship (e.g., workaholic, lazy, passive).

Homogamy, Complementarity, and Relationship Satisfaction in Same-Sex Couples

Although the vast majority of research has focused on homogamy and complementarity in heterosexual couples, a few recent studies have also concentrated on the homogamy principle in gay men and women, in particular using demographic data. Male gay couples were less homogamous in age and education than their heterosexual counterparts (Andersson, Noack, Seierstad, & Weedon-Fekjær, 2006; Schwartz & Graf, 2009; Verbakel & Kalmijn, 2014). Kurdek and Schmitt (1987) found that male gay couples were less similar in age, income, and education than the other types of couples (heterosexual and lesbian couples). Other studies focusing on homogamy in physical characteristics found that a huge proportion of gay men and women prefer and couple with partners of a similar height, in contrast to heterosexual men and women who prefer and couple with partners shorter or taller than themselves, respectively (Valentova, Bártová, Štěrbová, & Varella, 2016a; Valentova, Stulp, Třebický, & Havlíček, 2014). Further, Brazilian and Czech lesbian women showed self-similar preferences for waist-to-hip ratio in a potential female partner. Moreover, women from the Czech Republic preferred self-similar buttock size and breast shape and Brazilian women preferred self-similar breast size (Valentova, Bártová, Štěrbová, & Varella, 2017), and gay men preferred self-similar degree of beardedness (Valentova, Varella, Bártová, Štěrbová, & Dixson, 2016b). A recent study also found overall preferences for self-similarity in personality among gay and heterosexual men.

However, homogamy between actual partners was significantly lower, particularly in gay men (Štěrbová et al., 2016).

Studies focusing on a possible influence of homogamy on relationship quality in same-sex couples have shown that gay men and women were happier when their current partners came from the same environment and tended to have similar habits, values, and beliefs (Kurdek, 1991; Peplau & Fingerhut, 2007). Another study, however, did not find any significant link between homogamy in demographic factors and relationship quality (Kurdek & Schmitt, 1987). Similarly, Todosijevic, Rothblum, and Solomon (2005) showed that similarity in the level of education, income, and level of "outness" about sexual orientation was not related to relationship satisfaction, but homogamy in age increased relationship satisfaction in gay male couples. A recent study showed that equal income in same-sex couples from the U.S. reduced the likelihood of breakup, and similarity in income was also linked to higher relationship quality (Weisshaar, 2014). Further, greater relationship satisfaction in gay and lesbian couples was connected with a similar level of power and decision making in both partners (reviewed by Peplau & Spalding, 2000).

Another characteristic which is supposed to be linked with relationship dynamics in same-sex couples is the dimension of masculinity and femininity of the partners. Despite the fact that, on average, gay men and women are more gender-nonconforming than heterosexual individuals (i.e., gay men are, on average, more frequently feminine, while lesbian women are more masculine, e.g., Ellis, Ratnasingam, & Wheeler, 2012; Lippa & Tan, 2001; Su, Rounds, & Armstrong, 2009), it has been found that gay individuals prefer romantic partners who are rather gender-typical (Bailey, Kim, Hills, & Linsenmeier, 1997; Boyden, Carroll, & Maier, 1984; Harry, 1982; Jaffe & Chacon-Puignau, 1995; Phua, 2002). Some studies showed that these preferences for masculinity can have a negative impact on relationship satisfaction (Wade & Donis, 2007; Wester, Pionke, & Vogel, 2005), because many gay men are worried that their partner would lose interest if they act or appeared more feminine (e.g., Sánchez, Greenberg, Liu, & Vilain, 2009; Taywaditep, 2001). Bailey et al. (1997) further reported that the partner preferences of gay men depend on their own level of masculinity–femininity: More masculine men showed higher preferences for masculinity and vice versa. Similarly, Boyden et al. (1984) found that men with a higher level of masculinity desired ideal partners who were more logical (on average, a more masculine trait) and gay men with a higher level of femininity desired ideal partners with expressive characteristics (on average, a more feminine trait). Also, men with low masculinity desired more dependent partners (on average, a more feminine trait). Both groups of gay men desired partners who were similar in age and in the level of masculinity–femininity they themselves exhibited.

Concerning actual relationships, the ethnographic and anthropological literature reports two basic models of homosexual relationships that are based on gender roles established between partners: The gender-stratified model states that one of the partners is rather masculine, while the other rather feminine, which is frequently connected to activity and passivity during sexual activities (e.g., Carballo-Diéguez et al., 2004; Moskowitz & Hart, 2011), whereas the egalitarian model states that partners do not have strictly differentiated gender roles and are usually peers (Kurdek, 2004). As outlined above, gay men mostly from Western populations prefer a level of masculinity–femininity similar to their own, while in non-Western populations the pattern can be different. Based on the anthropological literature and as illustrated on studies carried out on heterosexual couples, in Western societies we might rather expect homogamy in masculinity–femininity in male same-sex couples. Furthermore, based on studies on homogamy in other traits, the level of homogamy in masculinity–femininity might also positively influence relationship quality in same-sex couples.

Finally, although there are several available methods used to measure masculinity–femininity, in the current two studies we tested our hypotheses using the two most frequently used questionnaires: the recalled Childhood Gender Nonconformity Scale (CGN; Rieger, Linsenmeier, Gygax, & Bailey, 2008) and the Gender Diagnosticity Scale (GD; Lippa & Connelly, 1990), which is based on adult occupational and hobby preferences that differ, on average, between men and women. Importantly, both CGN and GD are related to sexual orientation. CGN has been shown to be a strong predictor of adult sexual orientation and sexual orientation itself is associated with adult personality characteristics, such as Big Five personality traits or gender-related interests (Lippa, 2005; Valentova, Štěrbová, Bártová, & Varella, 2016c). Using GD, gay men show greater preferences for hobbies and occupations that are in the given population more typical for women (Lippa, 2000, 2002; Lippa & Tan, 2001). Another study showed that recalled CGN correlated with GD, and they were similarly linked to male sexual orientation: Gay men reported higher CGN and also preferred more feminine occupations than heterosexual men (Lippa, 2008).

The Present Study

The main aim of the present study was to test the homogamy or complementarity of masculinity–femininity in actual long-term male same-sex couples and its influence on relationship quality. According to a widespread belief, gay couples are characterized by complementarity of gender roles (one partner being rather masculine, while the other rather feminine; Peplau & Cochran, 1990). Nevertheless, previous studies conducted in Western populations have shown that gay men tend to prefer partners of a similar degree of masculinity–femininity (e.g., Bailey et al., 1997). Here we tested whether homogamy in masculinity–femininity was also evident in male long-term same-sex couples and whether this aspect had any influence on relationship quality. To test this presumption, in Study 1, we

used recalled Childhood Gender Nonconformity Scale (CGN), while in Study 2 we used Gender Diagnosticity Scale (GD).

Based on previous studies, we hypothesized that long-term male same-sex couples would resemble each other in their masculinity–femininity and that couples with higher relative homogamy in masculinity–femininity would report higher relationship quality.

Study 1

Method

Participants

The target sample consisted of 60 gay men between 19 and 47 years, 30 participants (*M*age = 29.2 years, SD = 7.3) and their long-term partners (*M*age = 29.3 years, SD = 7.0). On the seven-point Kinsey scale (from 0 = exclusively heterosexual to 6 = exclusively homosexual), all participants identified themselves as predominantly or exclusively homosexual, i.e., scoring 4–6. At the time of the data collection (2014), participants reported being in a relationship for at least 3 months (*M*relationship length = 39.4 months, SD = 38.8, range 3–127) and they considered their relationship as a long-term (i.e., a relationship with someone that you can imagine being with for the foreseeable future). The participants were recruited through several different methods. A flyer announcing the study was posted on social networks (online) and e-mails were sent to participants who had already participated in our previous research and agreed to cooperate in the future. All participants were further asked to spread this information. As a result, the gay participants came mainly from a non-student population from Prague, Czech Republic.

Measures

Each participant and their partner completed a set of questionnaires anonymously. The first questionnaire focused on general sociodemographic data, such as age, occupation, level of education, and sexual orientation. The same-sex couples further completed the Dyadic Adjustment Scale (DAS), which measures the quality of the current relationship (Spanier, 1976). The questionnaire consists of 32 items, which are scored in a standardized way to compute the total score comprising four subscales: Dyadic Consensus (e.g., handling family finances), Dyadic Satisfaction (e.g., Do you kiss your mate?), Dyadic Cohesion (e.g., Do you and your mate engage in outside interests together?), and Affectional Expression (e.g., demonstrations of affection). In this study, we used a Czech version translated by Kratochvíl (2006), and we found a Cronbach's alpha = .90. The total DAS scores of both partners were positively correlated (bias corrected and accelerated bootstrap 95% confidence intervals, 95% BCa CIs, are given in brackets), $r = .56$ [.16, .83], $N = 30$, $p = .001$, as well as all its subscales; thus, for further analyses, average DAS scores of the two partners were used (see Table 1). Finally, each participant completed the CGN scale. The CGN consists of 7 items, which are computed in a standardized way to obtain the total score (Rieger et al., 2008). A higher total score means higher childhood gender nonconformity (i.e., femininity in men and masculinity in women). In this study, we used a Czech version translated by Valentova, Rieger, Havlicek, Linsenmeier, and Bailey (2011). Cronbach's alpha for the CGN score was .83 (see Table 1).

Table 1 Descriptive statistics of the Dyadic Adjustment Scale (DAS) and the Childhood Gender Nonconformity Scale (CGN) in Study 1 ($N = 30$)

	M	SD
CGN[a]	30.87	9.25
Partners' CGN[a]	35.46	7.32
DAS total[b]	108.90	13.72
Dyadic consensus[c]	48.25	7.40
Dyadic satisfaction[d]	35.91	3.81
Dyadic cohesion[e]	16.30	2.75
Affectional expression[f]	8.43	1.83

[a] Absolute range = 7–49 (higher score higher childhood gender nonconformity)

[b] Absolute range = 0–151 (higher score higher relationship quality)

[c] Absolute range = 0–65 (higher score higher dyadic consensus)

[d] Absolute range = 0–50 (higher score higher dyadic satisfaction)

[e] Absolute range = 0–24 (higher score higher dyadic cohesion)

[f] Absolute range = 0–12 (higher score higher affectional expression)

Procedure

Male gay participants completed the online questionnaires using a Web-based survey tool, Qualtrics, Inc. Each participant and his partner received a unique code in order to be able to pair the data of each couple. Before starting the online questionnaire, each participant read the informed consent and indicated he agreed to it by clicking an ("I Agree") button in order to proceed. At the end of the session, which on average took 1 h, each couple received financial recompense equivalent to 10 USD.

Statistical Analysis

First, to determine whether partners were more similar to each other in CGN than random dyads from the sample, one-way intraclass correlations coefficients (ICCs) for unordered couples between the partners on this trait were produced. Then, following previous studies (e.g., Varella, Valentová, Pereira, Martins, & Caramaschi, 2012), the degree of each couple's homogamy was computed as the absolute difference between the partners' scores on the CGN. In order to test whether the

level of homogamy in CGN among partners predicts their relationship satisfaction, correlations between the degree of homogamy in CGN and DAS (both total and DAS subscales) were conducted. Next, in order to explore possible differences between different types of couples (feminine–feminine, masculine–masculine, feminine–masculine), the CGN scores of gay partners were entered in an exploratory cluster analysis. Cluster membership for each participant was noted, and depending on both partners' scores, the pair was categorized as either feminine–feminine, masculine–masculine, feminine–masculine. To explore differences between these three categories of couples, a one-way ANOVA was conducted.

Results

All analyses were carried out using SPSS 21.0 (IBM). Except for the absolute difference between partners in CGN, data were found to be normally distributed. Intraclass correlations showed that the partners were no more alike than individuals paired at random in their CGN, with an ICC of −.26 [−.56, .09], $p = .927$. In the total DAS score, partners were more alike than random pairs (ICC = .57 [.28, .77], $p < .001$), and this also applied to all the DAS subscales (see Table 2).

In order to test whether the level of homogamy in CGN among partners predicted their relationship quality, Pearson correlations between the degree of homogamy in CGN and DAS (both total and DAS subscales) were conducted, yielding a negative relationship between the homogamy level in CGN and average of partners' Dyadic Cohesion ($r = -.41$ [−.71, −.02], $N = 30$, $p = .022$) and Affectional Expression ($r = -.38$ [−.60, −.13], $N = 30$, $p = .035$). CGN showed 17.39% of shared variability with average of partners' Dyadic Cohesion and 14.90% of shared variability with Affectional Expression. Thus, the more dissimilar the partners were in Childhood Gender Nonconformity, the lower Cohesion and Affectional Expression they reported. In other words, higher similarity in CGN among partners was related to higher relationship quality.

To explore differences between feminine–feminine, masculine–masculine, feminine–masculine couples, first, a cluster analysis was conducted, which yielded a model of two clusters of a good cluster quality (the average silhouette coefficient of .70). The majority of men, 56.7% ($n = 34$), scored as rather feminine, while 43.3% ($n = 26$) were rather gender-conforming. Then, each couple was categorized depending on either partner's scores, resulting in 9 couples (30%) in which both of the partners were rather feminine, 5 couples (16.7%) in which both partners were rather masculine, and 16 couples (53.3%) where the partners were of mixed gender roles. A one-way ANOVA did not show any differences between these three groups in their average total DAS score (see Table 3 for details). This does not go against the previously reported correlations between CGN and DAS subscales. This is because they seem to have been driven by two influential cases, which is any case that significantly alters the value of a correlation or regression coefficient whenever it is deleted from an analysis (e.g., Allen, 1997), that were identified by means of influence diagnostics. Hence, these correlations would have been rendered nonsignificant upon the exclusion of these causes. It is therefore possible that the presence of these influential cases has a slightly different effect on correlational analyses and the ANOVAs.

Table 3 Differences among the three categories of couples (masculine–masculine, feminine–feminine, masculine–feminine) in the average Dyadic Adjustment Scale scores, tested with a one-way ANOVA

	$F(2, 27)$	p
Dyadic adjustment total	.34	.71
Affectional expression	.94	.40
Dyadic cohesion	.22	.12
Dyadic consensus	.21	.80
Dyadic satisfaction	.02	.97

Study 2

Method

Participants

The target sample consisted of 80 gay men aged between 18 and 40 years: 40 participants (Mage = 24.2 years, SD = 4.6)

Table 2 Intraclass correlation coefficients of the Childhood Gender Nonconformity Scale and Dyadic Adjustment Scale scores in Study 1 ($N = 30$)

	ICC	95% BCa CI	p
Childhood gender nonconformity	−.26	[−.56, .09]	ns
Dyadic adjustment total	.57	[.28, .77]	<.001
Dyadic consensus	.46	[.13, .70]	.004
Dyadic satisfaction	.50	[.18, .72]	.002
Dyadic cohesion	.54	[.24, .75]	.001
Affectional expression	.72	[.50, .85]	<.001

The bias corrected and accelerated bootstrap 95% confidence intervals, 95% BCa CIs, are given in brackets

and their long-term partners (*M*age = 27.4 years, SD = 5.2). All participants indicated their sexual orientation on the seven-point Kinsey scale as predominantly or exclusively homosexual. At the time of data collection (2012), participants had been in a relationship for at least 3 months (*M*relationship length = 32.3 months, SD = 28.0, range 3–116). The participants were recruited using the same methods, as in Study 1.

To determine what hobbies and occupations are more typical for women and men in the general population, we included a control sample of 65 heterosexual men between 19 and 31 years (*M*age = 23.4 years, SD = 2.5) and 61 heterosexual women between 19 and 30 years (*M*age = 23.2 years, SD = 2.6). All heterosexual participants indicated their sexual orientation on the seven-point Kinsey scale between 0 and 2. Based on analyses of this sample, we were able to apply the GD as an intra-sexual measure of masculinity–femininity in the homosexual sample.

Measures

Each participant completed a set of questionnaires focusing on general sociodemographic data, as in Study 1. Further, all participants completed the GD Scale, which measures masculinity and femininity through occupational and hobby preferences (Lippa & Connelly, 1990). We used short versions of the two subscales, with 40 items for occupation preferences and 22 items for hobby preferences. Occupational and hobby preferences were indicated on a 5-point scale ranging from 1 (strongly dislike) to 5 (strongly like).

The same-sex couples also completed the DAS, as in Study 1.

Procedure

Similarly to Study 1, each male gay participant and his partner completed online questionnaires using a Web-based survey tool, Qualtrics, Inc. Participants also received unique codes, read, and agreed to the informed consent form at the beginning of the session. At the end of the session, which on average took 1 h, each couple received financial recompense equivalent to 12 USD.

Heterosexual participants completed a printed version of the questionnaires in laboratory settings before taking part in another procedure (~ 3 h) aimed at assessments of physical attractiveness and health, which was not part of this study. Each of them signed a printed informed consent form, and at the end of the session, they received financial recompense equivalent to 18 USD.

Statistical Analysis

First, discriminant analyses were conducted on data from 126 heterosexually oriented individuals (65 males) in order to, firstly, discriminate between males and females based on their occupational and hobby preferences, respectively, and, secondly, to subsequently classify these preferences as rather male- or female-typical. For both the occupational and hobby preferences, the analysis was twofold. Firstly, in an initial analysis, using the SPSS random number generator function, data from 66.7% of randomly selected heterosexual participants ($n = 84$, 42 males) were used to compute the model and the remaining 33.3% ($n = 42$, 23 males) were used for subsequent model validation. Then, final models were computed on the data from 100% of the heterosexual individuals. In this way, the degree was established to which the individual occupational ($N = 40$) and hobby ($N = 22$) preferences, respectively, could discriminate between the genders and the preferences were thus classified as either male- or female-typical. The models were subsequently applied to the non-heterosexual males to produce their individual discriminant scores. The resulting discriminant scores were taken as measures of male–female occupations (MF-Occ) and male–female hobbies (MF-Hob), respectively.

Next, a one-way ANOVA on participants grouped into heterosexual males, gay males, and heterosexual females was conducted to test differences in MF-Occ and MF-Hob, respectively.

Further, in order to determine whether the male gay partners were more alike in their occupational and hobby preferences than randomly paired individuals from the sample, ICCs for unordered couples were conducted using the SPSS' Reliability Analysis feature. Cronbach's alpha one-way random model was employed.

Next, the degree of homogamy of each couple was computed as the absolute difference between the partners' MF-Occ and MF-Hob scores. To explore the relationship between homogamy in MF-Occ and MF-Hob on the one hand and the average DAS score of the two partners, both total and subscales, on the other hand, we ran Pearson correlations between these variables.

Finally, in order to investigate possible differences between categories of couples as in Study 1, MF-Occ and MF-Hob of the same-sex couples were entered in two exploratory cluster analyses and categorized each couple as either feminine–feminine, masculine–masculine, or feminine–masculine. Subsequently, a one-way ANOVA was conducted on average DAS scores.

Results

The initial discriminant model based on occupational preferences discriminated between men and women with 97.4% accuracy in the participants selected to produce the model and with 73.7% accuracy for the unselected ones used for validation. The initial model based on hobby preferences did so with 91.1% accuracy in the selected participants and 73.4% accuracy in the unselected ones. In the final discriminant model computed on the occupational preference data from all the heterosexual individuals, the single function extracted accounted for 100% of the variance in the occupational preferences and significantly differentiated men and women, Wilks' $\lambda = .33$,

$\chi^2(40) = 105.14$, canonical $R^2 = .669$, $p < .001$. In the hobby preferences discriminant model, the function also accounted for 100% of the variance in the hobbies and significantly differentiated men and women, Wilks' $\lambda = .47$, $\chi^2(a22) = 80.80$, canonical $R^2 = .52$, $p < .001$. The two resulting discriminant scores were taken as measures of male–female occupations (MF-Occ) and male–female hobbies (MF-Hob), respectively.

A one-way ANOVA on participants grouped into heterosexual males, gay males, and heterosexual females showed a significant difference in the average MF-Occ among the three groups, $F(2, 194) = 44.25$, $p < .001$, $\eta^2 = 0.313$, $\omega 2 = 0.305$. The Tukey post hoc test showed that heterosexual women ($M = -1.42 \pm .93$, $n = 58$) scored significantly lower than heterosexual men ($M = 1.40 \pm 1.05$, $n = 59$), $p < .001$, Cohen's $d = 1.73$, and also than gay men ($M = -.03 \pm 2.23$, $N = 80$), $p < .001$, Cohen's $d = 0.85$. There was also a significant difference between heterosexual and gay men, $p < .001$ (see Fig. 1; Appendix A1 in Supplementary material). Similarly, there was a significant effect of sex and sexual orientation on MF-Hob, $F(2, 199) = 54.94$, $p < .001$. The Tukey post hoc test showed that heterosexual women ($M = -1.07 \pm 1.03$, $n = 59$) scored significantly lower than heterosexual men ($M = 1.02 \pm .96$, $n = 62$), $p < .001$, and also than gay men ($M = -.42 \pm 1.30$, $N = 80$), $p < .001$; there was also a significant difference between heterosexual and gay men, $p < .001$ (see Fig. 2; Appendix A2 in Supplementary material).

One-way ICC for unordered couples, which were conducted to determine whether the gay partners were more alike in their occupational and hobby preferences than randomly paired individuals from the sample, showed that the partners were no more alike than individuals paired at random in their

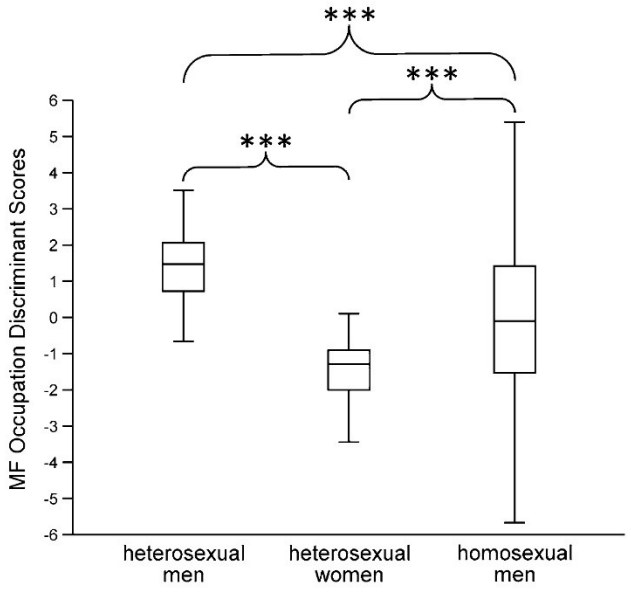

Fig. 1 MF occupation scores of heterosexual men, heterosexual women, and gay men. ***Difference at $p < .001$

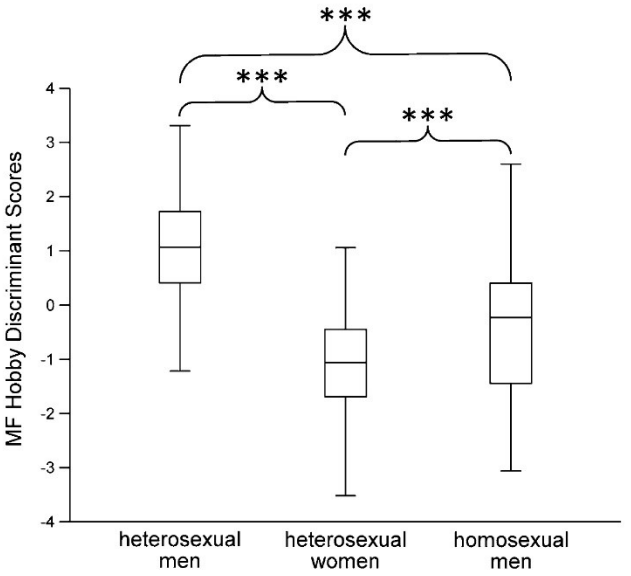

Fig. 2 MF hobby scores of heterosexual men, heterosexual women, and gay men. ***Difference at $p < .001$

MF-Occ, with a single measure ICC of .14 [−.17, .43], $p = .180$. Similarly, we did not find a significant correlation for the MF-Hob (ICC = .21 [−.09, .48], $p = .089$).

Pearson correlations, which were conducted to explore the relationship between homogamy in MF-Occ and MF-Hob on the one hand and the average DAS score of the two partners, both total and subscales, on the other hand, yielded no significant relationships.

Further, cluster analyses, which were performed to explore differences in MF-Occ and MF-Hob between couples categorized as feminine–feminine, masculine–masculine, or feminine–masculine, as in Study 1, yielded models of good cluster quality (the average silhouette coefficient of .70). In the case of MF-Occ, 53.8% ($n = 43$) of men were rather feminine, while 46.2% ($n = 37$) rather masculine. In the MF-Hob, 55.6% ($n = 45$) of the men were rather masculine, while 44.4% ($n = 36$) were rather feminine. According to MF-Occ, in 13 couples (32.5%) both of the partners were rather feminine, in 11 (27.5%) both were rather masculine, and in 16 (40.0%) with mixed gender roles. A one-way ANOVA did not show any differences between these three groups in their average DAS scores. According to MF-Hob, in 8 (20.0%) couples the partners were rather feminine, in 13 (32.5%) couples both partners were rather masculine, and in 19 (47.5%) couples the partners were of mixed gender roles. There was a trend of a difference in Cohesion scores, $F(2, 37) = 3.07$, $p = .058$. To be specific, couples in which both the partners were rather masculine ($M = 18.15 \pm 3.16$) scored significantly higher on the DAS subscale of Cohesion than couples of mixed gender roles ($M = 15.79 \pm 2.68$), $p = .051$, with a M difference of 2.36 [−.00, 4.73]. There were no significant differences involving the feminine pairs.

Discussion

In this article, we have presented two studies aiming to investigate possible homogamy in male same-sex couples regarding their masculinity–femininity and to test whether higher homogamy was associated with higher perceived relationship quality. In Study 1, the results showed that the more similar the partners were in Childhood Gender Nonconformity, the higher Cohesion and Affectional Expression they reported. In Study 2, the results showed that couples in which both the partners were rather masculine in hobby preferences reported higher Dyadic Cohesion subscale scores than couples with mixed gender roles.

The Affectional Expression subscale refers to expressing of emotions in a relationship, while Dyadic Cohesion refers to emotional experiences and time which a couple spends together, rather than the quality of their interaction (Spanier, 1976). As showed in previous studies, masculinity and femininity in men are associated with specific jobs and hobby preferences (Lippa, 2000, 2002; Lippa & Tan, 2001), and having them similar can increase time spent together, and even emotional expression in the couple. Achieving cohesion may lead to fewer arguments, and it can contribute to well-being in a relationship. For example, Kurdek (1993) compared the division of housework among gay, lesbian, and heterosexual couples from the U.S. In heterosexual couples, most of the housework was done by women, while these tasks were divided more equally between both partners in same-sex couples. Similarly, more recent studies have shown that in heterosexual couples, women continue to perform most of the housework tasks (e.g., Mannino & Deutsch, 2007; Pinto & Coltrane, 2009). In contrary, same-sex households which are based on more similar gender roles of the partners can be more egalitarian in the division of labor (Goldberg, Smith, & Perry-Jenkins, 2012; Sánchez et al., 2009), some activities can be performed by both partners together, and/or the partners are more flexible in the distribution of tasks based on time options or personal preferences of the individual.

Concerning masculinity–femininity in general, previous studies focusing on heterosexual couples have found that higher similarity between partners in gender roles has a positive effect on relationship satisfaction. Aube and Koestner (1995) found a positive correlation between partners in gender-related attitudes, and couples with similar gender-related attitudes also reported higher dyadic adjustment. Another study showed that similarity in the femininity dimension among heterosexual partners was positively related to happiness of both the wife and the husband (Antill, 1983). In other words, couples in which both partners were high on femininity had higher Dyadic Consensus and Satisfaction than couples in which at least one of the partners was low on femininity. A few studies also showed that a similar level of masculinity between partners was associated with their happiness in a relationship (e.g., Antill, 1983; Baucom & Aiken, 1984; Burger & Jacobson, 1979; Peterson, Baucom, Elliott, & Farr, 1989). In majority of these studies, masculinity and femininity were assessed by the short form of Bem Sex-Role Inventory (BSRI) proposed by Antill and Russell (1980), by Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1974) or by Masculinity (MSC) and Femininity (FMN) Scales (Baucom, 1976).

Thus, it seems that one of the factors which play at least same role in relationship quality in both heterosexual and same-sex couples is similarity in masculinity–femininity. The resemblance in gender-related attitudes and interests is important, because partners may be in many cases mutually supportive to each other, which in turn can lead to fewer quarrels and to higher relationship satisfaction.

Interestingly, although previous studies showed that more masculine gay men preferred rather masculine partners (Bailey et al., 1997; Boyden et al., 1984), we did not find similar results in the context of actual long-term male same-sex couples. In other words, in our study, the partners were not more similar in masculinity–femininity to each other than randomly paired individuals from the sample. This result can be explained by several factors. Firstly, previous studies have focused on ideal preferences, not on actual mate choices, which can be different. Thus, preferences for self-similarity in masculinity–femininity do not need to translate into actual mate choices, as already shown in the area of personality and physical characteristics in heterosexual individuals (Courtiol, Picq, Godelle, Raymond, & Ferdy, 2010; Dijkstra & Barelds, 2008; Valentova et al., 2016a, c) and also in gay men and women (Valentova et al., 2016a, b, c, 2017). Further, previous studies repeatedly showed that gay individuals are, on average, rather gender-atypical, so that gay men are "more feminine than masculine" and lesbians are "more masculine rather than feminine" (Bailey & Zucker, 1995; Lippa, 2002, 2005, 2008; Lippa & Tan, 2001; Rieger et al., 2008). Thus, if many gay men are rather gender-atypical, masculine gay men have a lower chance to find the preferred gender-typical partner. This problem could have also occurred in our sample where a lot of participants were rather masculine and, therefore, they just could not find a male partner at the same level of femininity–masculinity as themselves, but those who did ended up more satisfied.

Secondly, one of the most important causes of homogamy is meeting opportunities (Kalmijn, 1998; Kalmijn & Flap, 2001), according to which a chance to find an appropriate partner increases with the absolute size of the marriage/partnership market. It has been pointed out that the absolute size of the marriage market is smaller for gay than for heterosexual individuals (McFarland, 1975). In countries with a less liberal approach to homosexuality, gay men and women can be forced to hide their sexual orientation in public and thus have fewer chances to find a partner in public meeting places, such as at work or school, where people are more homogamous in their

personality (Blumstein & Schwartz, 1983). Although in the Czech Republic rather liberal attitudes toward homosexuality prevails, same-sex relationships are still not completely accepted (Weiss & Zvěřina, 2001) and gay individuals can thus be motivated to hide, or at least not to advertise, their sexual identity. Moreover, the percentage of gay individuals is much smaller than that of heterosexual ones (Weiss & Zvěřina, 2001). This fact can also reduce the chances to meet an appropriate partner. Fewer opportunities to meet can explain, for example, why same-sex couples are less homogamous in age or education than heterosexual couples (Noack, Seierstad, & Weedon-Fekjær, 2005; Rosenfeld & Kim, 2005; Schwartz & Graf, 2009; Solomon, Rothblum, & Balsam, 2005). Further, Cardell, Finn, and Marecek (1981) found that compared to heterosexual and lesbian couples, gay couples were the least similar in sex-role identity, but at the same time couples with greater similarity in sex roles reported higher partnership satisfaction.

The current study had several shortcomings, such as a relatively small sample size (30 and 40 couples in Study 1 and 2, respectively), recruited online and thus with regular access to the internet. Thus, it would be helpful to repeat the study with a larger sample. Although this is far from a representative sample, this is one of the few studies where both same-sex partners were willing to participate and we thus were able to analyze the answers of both partners, not only self-reports provided by only one of them, or individual preferences only. Furthermore, our study revealed small effects sizes, and thus, the results should be regarded with caution.

Finally, participants in Study 1 identified themselves on the seven-point Kinsey scale from 4 to 6 and in Study 2 they identified themselves on positions 5 and 6. Thus, we have also analyzed individuals who have not identified themselves as exclusively homosexual. Nevertheless, results based on predominantly and exclusively homosexual men only yielded virtually the same results as reported. Of course, a similar study aimed specifically at bisexual men would be of great interest, since their mating tendencies can differ from both heterosexual and homosexual men, and their mating market might be even larger than for heterosexuals.

Conclusion

Our first hypothesis that gay men tend to have partners of a similar level of masculinity–femininity was not supported, but we did find that similarity in masculinity–femininity was positively associated with the dyadic adjustment of gay couples. In other words, although gay male couples, on average, do not need to be similar in their actual level of masculinity–femininity, resemblance in this domain increases the quality of their relationship. This result adds to previous studies showing that homogamy in same-sex couples in sociodemographics and personal characteristics increased relationship satisfaction. Although we cannot say that gay men are coupled on the basis of homogamy in masculinity–femininity, it is clear that relationship quality is linked to a gender egalitarian model rather than to a gender stratified one. Thus, a widespread stereotype suggesting that same-sex partners are divided by different genders roles seems to be, at least in our sample from a Western society, rather incorrect.

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Příloha V

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Preferred and actual relative height are related to sex, sexual orientation, and dominance: Evidence from Brazil and the Czech Republic☆

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ABSTRACT

Height and dominance influence mate preferences and choices. We explored preferred relative height (PRH) among ideal partners and actual relative height (ARH) among long-term partners in heterosexual and non-heterosexual men and women from Brazil and the Czech Republic. Furthermore, we tested whether PRH and ARH are influenced by own height, and submissiveness-dominance in relationship and sexual activities. In a sample of 1709 respondents (379 heterosexual men, 311 non-heterosexual men, 853 heterosexual women, and 166 non-heterosexual women) heterosexual individuals showed the 'male-taller-pattern' preferences and choices, while non-heterosexuals preferred and chose partners of a height similar to themselves; an 'equal-height-pattern'. Regression analyses further showed that own height positively predicted both PRH and ARH in all four groups of participants. Moreover, non-heterosexual men and women who preferred to be dominant in sexual activities and heterosexual men who preferred to be dominant in relationships preferred to be taller than their partner. Thus, in Western populations, preferences for relative height differ between heterosexual and non-heterosexual individuals, but in both cases they relate to dyadic submissiveness-dominance and own height. Preferences for relative height and dominance can work as a guide to actual mate choices enhancing ancestral fitness, although they differ from actual choices in modern humans.

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1. Introduction

Human body height, as an evolved sexually dimorphic trait, strongly influences mate preferences and actual choices of men and women (Salska et al., 2008). The high heritability of human height means that few environmental factors are responsible for individual differences in this trait (Silventoinen et al., 2003). However, the very low heritability of the variation in the actual mate choices that people make in relation to height (Zietsch, Verweij, Heath, & Martin, 2011) indicates that environmental factors crucially influence individual variation. Therefore, search for factors that modulate mate choice and also preferences, is relevant for evolutionary-based research.

Studies have shown that a preference for males being taller than their female partners is widespread in Western populations (e.g., Fink, Neave, Brewer, & Pawlowski, 2007; Pawlowski, 2003). Male height is associated with intra-sexual dominance, which leads to a higher resource acquisition (Stulp & Barrett, 2014). Thus, female preferences for taller men are suggested to be adaptive, because they direct them to better resource providers. Preferences for relative height are, however, systematically modulated by several factors, such as population, individuals own height, self-esteem and personality characteristics. Preferences for the 'male-taller-pattern' were not supported in several studies of non-Western populations. For example, Datoga men and women from Tanzania preferred extreme height differences where a woman would be much shorter or much taller than a man (Sorokowski & Butovskaya, 2012). The present study included samples from two historically, culturally and ethnically diverse Western populations: Brazil and the Czech Republic.

Further, recent research suggests that individuals might adaptively adjust their preferences for relative height in accordance with their own height. It was, for example, shown, that in Western countries taller men and shorter women tend to prefer larger partner height differences than shorter men and taller women (Pawlowski, 2003; Stulp, Buunk, & Pollet, 2013). Moreover, inter-personal dominance as another sexually dimorphic trait was shown to be positively connected to individual height (Stulp, Buunk, Verhulst, & Pollet, 2015). Both own height and dominance might thus similarly moderate individual differences in preferences for relative height. Indeed, three recent studies showed that personality (Swami et al., 2008) and inter-personal characteristics, for example, dominance, influence relative

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height preferences. More specifically, more dominant heterosexual women tend to prefer relatively shorter male partners than less dominant women (Sorokowski, Sabiniewicz, & Sorokowska, 2015), while homosexual men who prefer to be more dominant also prefer to be taller than their partners (Valentova, Stulp, Třebický, & Havlíček, 2014).

Another factor that could influence relative height preferences is sexual orientation. Recent studies reported that, on average, non-heterosexual men (i.e., bisexual and homosexual) generally prefer rather masculine physical characteristics in their potential male partners (e.g., Zheng & Zheng, 2015), whereas non-heterosexual women, tend to prefer more feminine physical traits in their potential female partners (e.g., Bailey, Kim, Hills, & Linsenmeier, 1997; Cohen & Tannenbaum, 2001). However, these preferences are also modulated by individual factors, such as preferences of sex roles during sexual activities (Zheng & Zheng, 2015), participants' own masculinity–femininity (Bailey et al., 1997), and relationship status (Valentova, Roberts, & Havlíček, 2013). To our knowledge, only one study has focused on relative height preferences in non-heterosexual men (although not non-heterosexual women), who generally preferred somewhat taller male partners — although a substantial proportion of men preferred partners of the same height and a smaller proportion preferred shorter partners (Valentova et al., 2014). Furthermore, taller men preferred relatively shorter partners, and men who preferred to be taller than their partners also preferred to be more dominant in relationship and sexual activities, and vice versa. However, this study did not compare preferences of non-heterosexual and heterosexual populations; this is one of the main goals of the current study.

Finally, most studies have focused on factors that influence preferences, rather than actual choices regarding relative height among partners. However, preferences and actual choices can differ to some degree, since people make many compromises when it comes to actual pairing (Todd, Penke, Fasolo, & Lenton, 2007). In respect to height, although both heterosexual men and women prefer the 'male-taller-pattern' in the Western populations, women prefer men much taller than themselves, whereas men prefer women only slightly shorter than themselves (Stulp, Buunk, Kurzban, & Verhulst, 2013). Consequently, actual height difference between partners is a compromise between preferences of both sexes (Townsend & Wasserman, 1998), resulting in relationships with bigger height difference among partners than men would prefer and smaller than women would prefer. Thus, it is important to study both preferences and actual choice in order to disentangle how preferred height is translated to actual height.

1.1. Aims of the current study

One of the main aims of this study was to explore and compare preferred and actual relative height in heterosexual and homosexual men and women, from two diverse populations, Brazil and the Czech Republic. Height was chosen as a model sexually dimorphic trait because it can be studied in both sexes, in contrast to other characteristics that are specific to only one sex (e.g., beard). Moreover, height was unambiguously shown to be linked to male dominance (Stulp et al., 2015). Thus, here we aimed to extend the previous study (Valentova et al., 2014) of associations between preferred and actual relative height and dyadic submissiveness-dominance.

2. Methods

2.1. Participants

The total sample consisted of 2195 participants from Brazil and the Czech Republic, recruited as a part of a larger study of ideal partner preferences and actual partner choice. For the subsequent analyses we included participants between 18 and 50 years of age, and for the analyses of actual partner choices we included non-heterosexual coupled participants who indicated that they were in a long-term relationship with a partner of the same sex, and heterosexual participants who indicated they were in a long-term relationship with members of the opposite sex. Thus, 1709 responses (mean age = 26.61 years, range 18–50, SD = 6.72) entered the final analyses, including 22.2% heterosexual men (n = 379), 18.2% non-heterosexual men (n = 311), 49.9% heterosexual women (n = 853), and 9.7% non-heterosexual women (n = 166). Non-heterosexual women were significantly younger than heterosexual women ($p = .002$), and there was no other age difference between the groups.

The participants were recruited via snowball sampling through the use of mailing-lists obtained from our previous studies, through posts on Facebook, and LGBT oriented web pages in both countries. Data were collected through an online questionnaire using Qualtrics platform (http://www.qualtrics.com). Participants gave their informed consent, which required a mouse-click to confirm their willingness to complete an approximately 40-min, anonymous survey.

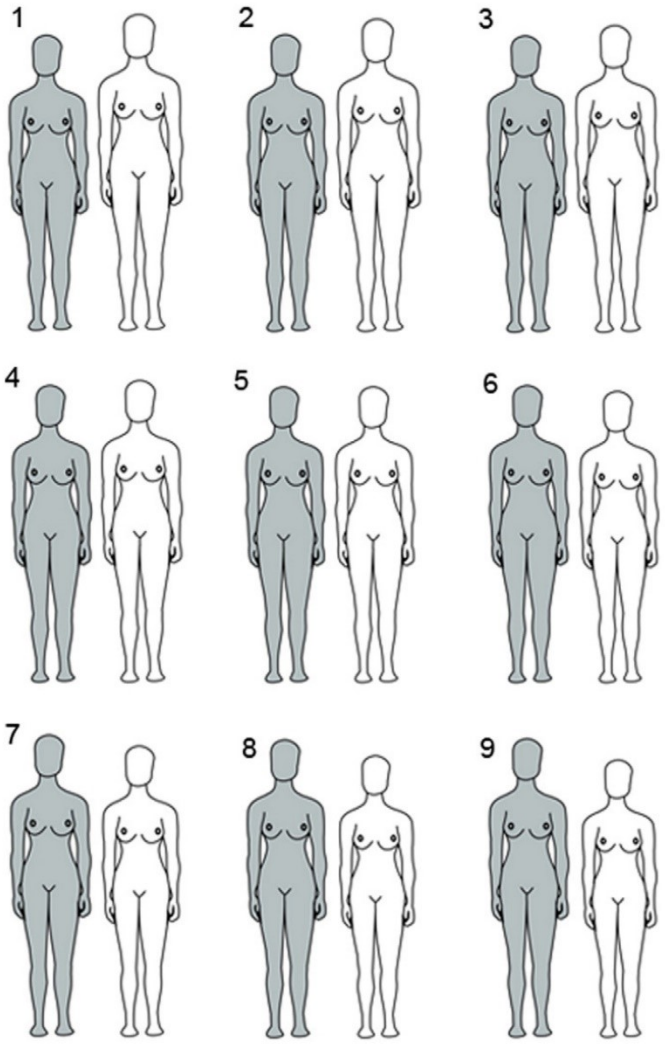

Fig. 1. Illustration of the stimuli used for assessing preferred and actual relative height among partners. This version of the stimuli was presented only to non-heterosexual women; adequate versions were presented to other groups of participants. The question asked: 'Indicate your preferred/actual height of your partner (white figure) compared to your own height (gray figure) — individuals in couple 5 are of the same height'.

2.2. Procedure

Participants were presented with scale drawings of nine partner pairs (Fig. 1) with varying relative height, developed for a previous study (Valentova et al., 2014). The depicted couples were centered on a couple of equal height (picture nr. 5), while four pictures on the left side presented couples with respondent becoming gradually shorter than his/her partner, and four pictures on the right side of the scale presented couples with respondent becoming gradually taller than his/her partner. In other words, the smaller number of the scale the respondent chooses, the shorter he/she would be/is relative to his/her partner. Participants were asked to select the drawing that depicted the preferred relative height (PRH) difference between them and their ideal partner, and in case they were actually in a long-term relationship, they were also asked to select the drawing that depicted the actual relative height (ARH) difference between them and their actual partner or the last ex partner.

Sexual orientation was reported using a Kinsey scale: 0 = exclusively heterosexual, 3 = bisexual, and 6 = exclusively homosexual. Forty-three and a half percent of men (n = 300), and 55.8% of women (n = 569) reported that they were exclusively heterosexual; 8.8% of men (n = 61) and 24.4% of women indicated they were somewhat heterosexual (n = 249); and 2.6% of men (n = 18) and 3.4% of women (n = 35) reported they were mostly heterosexual. For the analyses we classified these three groups as 'heterosexual individuals' (Ht).

We treated men and women as 'non-heterosexuals' (NonHt), when they indicated they were bisexual (2.3% of men, n = 16; 4.8% of women, n = 49), somewhat homosexual (1.2% of men, n = 8; 1.9% of women, n = 19), mostly homosexual (9.4% of men, n = 65; 4.9% of women, n = 50) and exclusively homosexual (32.2% of men, n = 222; 4.7% of women, n = 48). These percentages are not representative of the studied populations because the sampling sought to recruit a sufficient number of NonHt individuals.

In total, 50.9% (n = 193) of Ht-men and 47.6% (n = 79) of NonHt-women reported being in a long-term relationship with a female partner at the time of the study, and 48.2% (n = 150) of NonHt-men and 66.2% (n = 565) of Ht-women reported being in a long-term relationship with a male partner.

In using 7-point scales (where 1 = very submissive and 7 = very dominant) each participant indicated his or her ideal preference for a submissive or dominant role (SD) in a relationship ("Please, indicate whether in a potential relationship you would prefer to be more submissive and obedient towards your partner, or more dominant, leading, and in control") and in sexual activities ("Please, indicate whether in sexual activities with your ideal partner you would prefer to be more submissive and passive, or rather more dominant and active"). Respondents who reported being in a long-term relationship at the time of the study also indicated their SD in relationships and sexual activities with their actual partners or their last ex partners.

Each participant reported his/her own height (in cm), which was entered in subsequent regression models as a predictor variable.

3. Results

3.1. Group comparisons of preferred and actual relative height among partners

Univariate general linear model (GLM) with PRH as dependent variable, and country (Brazil X the Czech Republic) and participants grouped into Ht and NonHt men and women revealed a significant model ($F(7; 1418) = 36.7$, $p < .001$). Test of between-subject effects revealed that there was a significant effect of participants' group ($F(3; 1425) = 969.2$, $p < .001$). Post-hoc tests with Bonferroni correction showed that all groups differed significantly from each other (all p's $< .002$); Ht-women preferred partners somewhat taller than themselves (mean = 1.68, SD = .88), followed by NonHt-men (mean = 3.98, SD = 1.76), and NonHt-women (mean = 4.53, SD = 1.68) who preferred partners of more similar height; Ht-men generally preferred partners shorter than themselves (mean = 6.90, SD = 1.98).

Similarly, univariate GLM showed a significant model for the actual choice based on relative height ($F(7; 895) = 15.12$, $p < .001$). Test of between-subject effects revealed a significant effect of participants' group ($F(3; 902) = 303.7$, $p < .001$). Post-hoc tests with Bonferroni correction showed that with the exception of NonHt-men and NonHt-women, who did not differ from each other ($p = 1.00$), the groups differed significantly from each other (all p's $< .001$). Ht-women described their male partners as taller than themselves (mean = 2.28, SD = 1.48), and differed significantly from both NonHt-men (mean = 4.78, SD = 2.48) and NonHt-women (mean = 4.65, SD = 2.24) who described their partners as being of a similar height, and all groups differed significantly from Ht-men who described their partners as shorter than themselves (mean = 7.19, SD = 2.23).

3.2. Frequencies of preferred and actual relative height among partners

Since there was no effect of country on PRH or ARH, we combined frequencies of these variables for both populations. As shown in Fig. 2a, the majority of Ht-men (81.3%, n = 253), preferred a partner who would be shorter than themselves (i.e., they selected drawings # 6–9 in Fig. 1); a small proportion (7.4%, n = 23) preferred a relationship in which partners would be of similar height (i.e., they selected a drawing # 5 in Fig. 1); and 11.3% (n = 35) preferred a partner who would be taller than themselves (i.e., they selected drawings # 1–4 in Fig. 1). In contrast, none of the Ht-women (Fig. 2a) chose drawings that depicted women with shorter male partners; 1.1% (n = 8) preferred a man of the same height; and a vast majority (98.9%, n = 303) of Ht-women preferred a man taller than themselves. Among NonHt-men (Fig. 2a), the majority (62.0%, n = 168) preferred a partner who would be taller than themselves, 19.9% (n = 54) preferred a relationship in which partners would be of similar height, and 18.0% (n = 49) preferred a partner shorter than themselves. Among NonHt-women (Fig. 2a), almost half (45.0%, n = 63) preferred a partner taller than themselves, 32.9% (n = 46) of women preferred partners with a similar height, and a smaller proportion (22.2%, n = 31) preferred a partner shorter than themselves.

Fig. 2b shows that 82% (n = 144) of Ht-men were in a relationship with women shorter than themselves, a small proportion (13.0%, n = 23) was in a relationship with taller women, and 5.1% (n = 9) indicated that their partner was of the same height. Similarly, the majority (90.9%, n = 469) of Ht-women (Fig. 2b) were in a relationship with taller men, 5% (n = 26) indicated relationship with a man of the same height, and 4.1% (n = 21) were in a relationship with a shorter man. Among NonHt-men (Fig. 2b), almost half (48.2%, n = 66) indicated being in a relationship with a taller man; 8.8% (n = 12) were dating a man of the same height; and a substantial proportion of men (43.1%, n = 59) were in a relationship with a shorter man. Among NonHt-women (Fig. 2b), the majority (52.8%, n = 39) was in a relationship with a taller woman; 16.2% (n = 12) were in relationships with women of the same height, and more than a quarter (31.2%, n = 23) were dating a shorter woman.

Related-samples Wilcoxon Signed Rank test showed that there was no difference between PRH and ARH among Ht-men (W = 2 001,500, n = 152, $p = .062$) and NonHt-women (W = 625,000, n = 68, $p = .699$), but the preferences and actual choice differed among Ht-women (W = 20 340,000, n = 454, $p < .001$), and NonHt-men (W = 3 257,500, n = 123, $p < .001$). Both Ht-women and NonHt-men desired, on average, taller partners than they actually had.

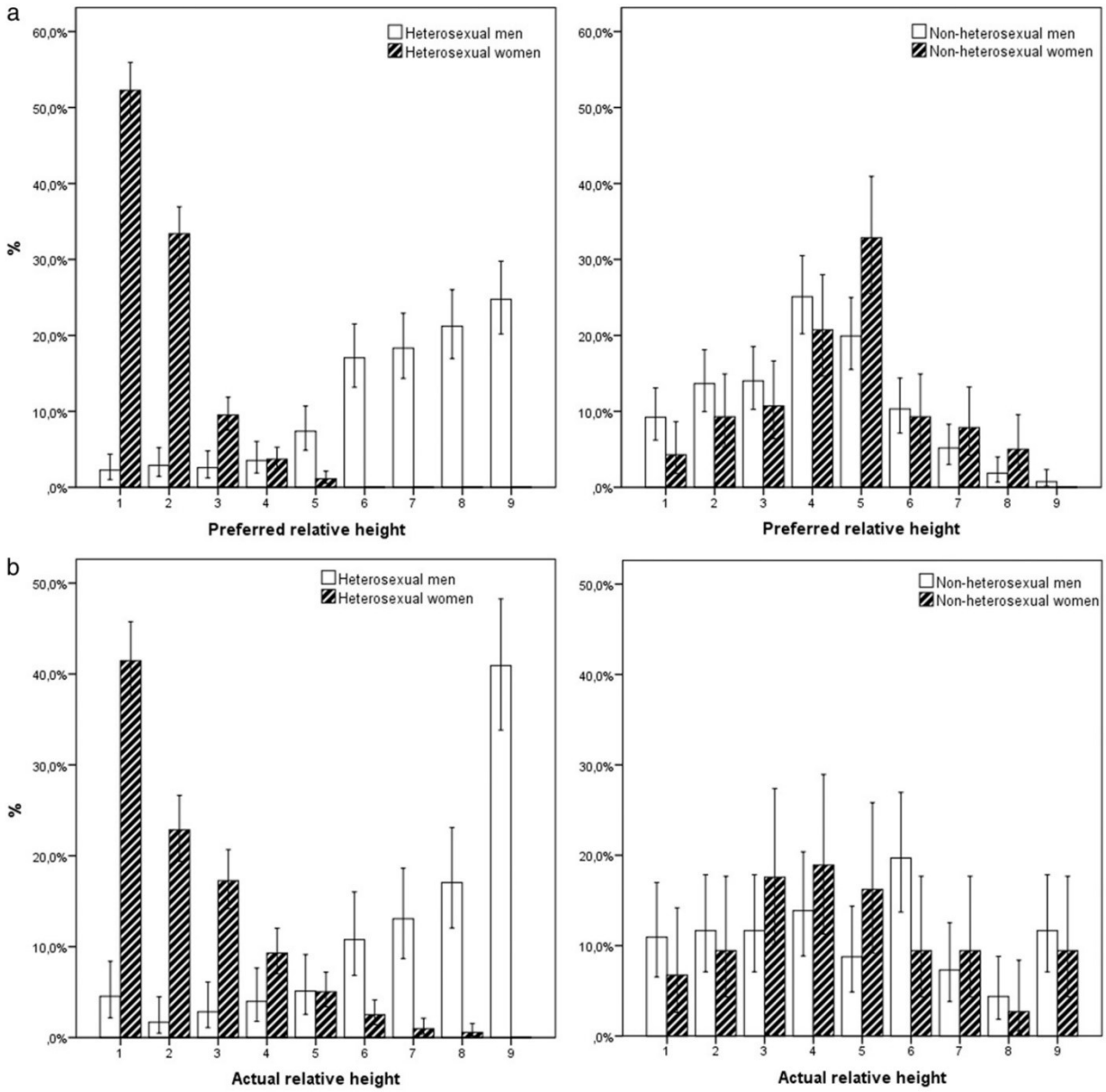

Fig. 2. a Frequencies of preferred relative height among partners b Frequencies of actual relative height among partners Figure note. The stimulus Nr. 1 depicts a couple where respondent is much shorter than his/her partner, stimulus Nr. 5 depicts couple of the same height and stimulus Nr. 9 depicts couple where respondent is much taller than his/her partner. The Error bars indicate 95% CI.

3.3. Associations among partners' dominance, sexual role, and relative height

For each group of participants, we performed two automatic linear regression models (ALM) (Yang, 2013), which allowed the entry of both continuous and categorical variables. The first model was designed to determine effects on participants' preferred relative height (PRH) of the following variables: participant's height, age, country, and preferred submissiveness-dominance (SD) in relationships and sexual activities. The second model tested whether participants' height, country, and actual SD in relationships and sexual activities predicted actual relative height among partners (ARH). The coefficients presented are unstandardized regression coefficients.

In Ht-men, the regression model for PRH was significant ($R^2 = .08$, $F(2, 310) = 14.392$, $p < .001$). Own height and preferred SD in relationship positively predicted male's PRH ($b = .07$, $t = 4.8$, $p < .001$; $b = .25$, $t = 2.4$, $p = .016$, respectively). Thus, the taller a man wants to be relative to his partner, the more dominant he wants to be in a relationship with her and the taller he is. Participants' height was a significant predictor of ARH ($R^2 = .12$, $F(1, 175) = 25.5$, $p < .001$; $b = .11$, $t = 5.1$).

In NonHt-men, the regression model for PRH explained almost 20% of the total variance ($R^2 = .197$), and was overall significant ($F(3, 270) = 23.1$, $p < .001$). Own height and preferred SD in sex positively predicted NonHt-men's PRH ($b = .09$, $t = 6.8$, $p < .001$; $b = .26$, $t = 3.3$, $p = .001$, respectively). Also, preferred SD in relationship non-significantly positively predicted PRH ($b = .19$, $t = 1.9$, $p = .053$). Thus, the taller a man wants to be relative to his partner, the more dominant he wants to be in sexual activities and the relationship, and the taller he is. Participants' height significantly predicted ARH ($R^2 = .18$, $F(1, 136) = 30.9$, $p < .001$; $b = .13$, $t = 5.6$, $p < .001$).

In Ht-women, the models for PRH and ARH were significant; $R^2 = .01$, $F(1, 703) = 8.2$, $p = .004$; $R^2 = .12$, $F(2, 515) = 35.2$, $p < .001$, respectively, showing that only participants' height predicted women's preferences ($b = .01$, $t = 2.9$, $p = .004$) and choice ($b = .08$, $t = 8.4$, $p < .001$).

In NonHt-women, the regression model for PRH was significant ($R^2 = .16$, F (2, 139) = 14.2, $p < .001$). Own height and preferred SD in sex were significant positive predictors of non-heterosexual women's PRH ($b = .10$, $t = 5.0$, $p < .001$; $b = .21$, $t = 2.2$, $p = .031$, respectively). Thus, the taller the woman wants to be relative to her partner the more dominant she wants to be in sex with her, and the taller she is. Participants' height was a significant predictor of the ARH ($R^2 = .25$, F (1, 73) = 24.8, $p < .001$; $b = .17$, $t = 5.0$, $p < .001$).

Neither age nor nationality emerged as a significant predictor in any of the models.

4. Discussion

This study had two primary goals: (1) to test and compare preferred and actual relative height in Ht and NonHt-men and Ht and NonHt-women from two populations; (2) to examine whether relative height preferences and choice are influenced by preferred and actual submissiveness-dominance among partners. Our findings indicate that relative height preferences and choice seem to adaptively vary across both countries based on the following characteristics: participants' sex, sexual orientation, and height. Furthermore, in all studied groups except for Ht-women, individuals who preferred to be taller in their relationship also preferred to be more dominant in relationships or sexual activities with their potential partners.

Our findings are consistent with previous studies in Western countries: Ht-men generally preferred and also chose female partners shorter than themselves, whereas Ht-women showed the opposite pattern (e.g., Fink et al., 2007; Pawlowski, 2003). Preferences and choice of NonHt-men and NonHt-women were located in the middle between the preferences of Ht-men and Ht-women, and thus closer to the middle point of our scale which depicts both partners of similar height. This is consistent with a previous study of Czech NonHt-men (Valentova et al., 2014). Relative height preferences and choice in NonHt-individuals were neither typically masculine, nor typically feminine, and thus cannot be simplified as gender-nonconforming. Rather, it seems that partner preferences and choice of NonHt-men and NonHt-women differ from both heterosexual men and women. Since there is no expected dimorphism in stature among same-sex partners, such variation can be highly adaptive, because it can broaden the pool of potential partners.

Importantly, PRH and ARH were similar in Brazil and the Czech Republic, despite the fact that Czechs tend to be taller than Brazilians (e.g., Varella, Valentova, Pereira, & Bussab, 2014). Thus, both populations seem to be similar in their preferences and choice of the 'male-taller-pattern' in heterosexual individuals, and 'equal-height-pattern' in non-heterosexual individuals. Because previous studies showed that the 'male-taller-pattern' in heterosexual individuals does not apply for different populations (e.g., Sorokowski, Sorokowska, Fink, & Mberira, 2012), future cross-cultural studies might also focus on PRH and ARH in NonHt-individuals in populations where a heterosexual 'male-taller-pattern' does not seem to be the rule.

Further, we showed that in Ht-men and NonHt-women PRH did not differ from ARH — which suggested that preferences of Ht-men and NonHt-women, on average, translate into their actual choice. On the other hand, Ht-women and NonHt-men desired, on average, partners relatively taller than they actually had. This is in line with some previous studies showing differences between preferred and actual partners in BMI (Courtiol, Picq, Godelle, Raymond, & Ferdy, 2010), relative height (Valentova et al., 2014), and in other characteristics (e.g., Todd et al., 2007). It can be that some groups of people have higher expectations for their ideal partners which might be more difficult to fulfill. From the evolutionary perspective, more demanding preferences of Ht-women, in particular for a highly desired trait, such as male height, might be highly adaptive, since women's preferences facilitate to choose the best partner possible. On the other hand, average preferences for relatively taller partners in NonHt-men might have been more difficult to fulfill, since the most available men in the population would be of a similar height.

Finally, we investigated whether preferred and actual dyadic submissiveness-dominance are linked to preferred and actual relative height. In line with a previous study (Valentova et al., 2014), NonHt-men who preferred to be more dominant in relationships and sexual activities preferred to be taller than their potential partner. Similar results applied for Ht-men and NonHt-women, whereas Ht-women did not show this association. Thus, in general, people who want to be more dominant towards their partners also want their ideal partners to be shorter, and conversely, suggesting that preferences for height are reflected in preferences for hierarchical position within the dyad. Interestingly, this relationship applied only to preferences, not actual relationships. Partner preferences for different traits (here relative height and dyadic dominance) can thus work coherently as an integrated guide to ancestral fitness enhancing choice, but because of current restrictions, such as partner availability or competition with rivals, they can differ from actual choice.

We did not find any link between preferred dyadic dominance and relative height in Ht-women — unlike a recent study by Sorokowski et al. (2015). Those authors found that dominance in Ht-women (but not Ht-men), as measured by the Ray Directiveness Scale (Ray, 1976), predicted PRH. Nevertheless, general dominance over others which is linked to male height (Stulp et al., 2015) can differ from tendencies to dominate romantic partners. Ht-women who prefer relatively taller men do not need to prefer men who would be dominant in a relationship, because such men can be aggressive towards the woman and her offspring.

Because the survey and recruitment was conducted online, only participants with access to the internet were able to participate, which might result in selection bias. Further, the relative height among actual partners was self-reported by the participants and not measured by the researchers. Future studies might thus focus on measuring of body height in both actual partners, and compare the measured relative height among partners with their preferences. Also, the actual dyadic dominance and relative height were reported by only one of the partners, and can be thus biased by his/her perception, which might differ from perception of the other partner. Furthermore, future studies might focus on other groups, such as individuals who prefer more extreme submissive or dominant roles during sexual activities (e.g., BDSM community), where the link between submissiveness-dominance in sex and relative height might be even more pronounced than in the general population.

5. Conclusion

The current cross-cultural findings expanded and supported previous research: both heterosexual preferences and actual pairings exhibited the 'male-taller-pattern'. However, this pattern is not typical for NonHt-men and NonHt-women, who prefer and choose partners of a height similar to themselves, namely they show an 'equal-height-pattern' preference and actual pairing.

Preferences and actual choice of relative height among partners are conditional; sex, sexual orientation, participants' height, and preferred dyadic dominance modulate these preferences and choices. Furthermore, although partner preferences may orient individuals towards choices that enhanced ancestral fitness, in modern conditions actual partner choices can differ from preferences — particularly in Ht-women and NonHt-men.

Studying partner preferences and choices, including samples from different populations and also sexual minorities is highly relevant for social and evolutionary psychology in the context of mating psychology, in particular mating intelligence, alternative reproductive strategies, and homosexual orientation. The research thus should take into account the complexity of mating, in order to better understand the human variation.

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Příloha VI

Valentova, J. V., Varella, M. A. C., Bártová, K., Štěrbová, Z., & Dixson, B. J. W. (2017). Mate preferences and choices for facial and body hair in heterosexual women and homosexual men: influence of sex, population, homogamy, and imprinting-like effect. Evolution and Human Behavior, 38(2), 241-248.

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Original Article

Mate preferences and choices for facial and body hair in heterosexual women and homosexual men: influence of sex, population, homogamy, and imprinting-like effect

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ABSTRACT

Recent research has reported that male body and facial hair influence women's mate preferences. However, it is not clear whether such preferences are typical for women or for individuals who prefer males as sexual partners. Here we explored body and facial hair in preferred and actual partners among men and women who prefer men as sexual partners. Including homosexual individuals provides a unique opportunity to investigate whether evolved mating psychologies are specific to the sex of the individual or sex of the partner. Based on an online survey of 1577 participants from Brazil and the Czech Republic, we found that, on average, homosexual men preferred hairier stimuli than heterosexual women, supporting past findings that homosexual men have strong preferences for masculine traits. Preferences for facial and body hair appear to be influenced less by sex of the preferred partner than sex of the individual, pointing to a possible sex-specific mating psychology. Further, Brazilians preferred bigger beards than Czechs, which was positively associated with the self-reported amount of beardedness in Brazil, suggesting that familiarity effects underpin cross-cultural differences in preferences for facial hair. Moreover, homosexual men preferred a self-similar degree of beardedness, and Czech women preferred a similar degree of beardedness as their fathers had during their childhood. However, these effects were not associated with the level of facial hair in their actual partners; in general, mate preferences and actual mate choices for facial and body hair differed. Thus, individual differences in some self-reported characteristics, cultural factors, and aspects of personal experience may modulate differences in preferences for masculine traits.
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1. Introduction

Humans differ from other primates in their marked reduction in body hair (Sandel, 2013). Estimates of the onset of reduced hirsutism range from 240kya-3 million years ago (Reed, Light, Allen, & Kirchman, 2007; Rogers, Iltis, & Wooding, 2004; Winter et al., 2001) and may reflect natural selection to meet thermoregulatory requirements (Ruxton & Wilkinson, 2011), reduce ectoparasite loads (Rantala, 2007), or originated as a by-product of neotenization (De Marinis & Asprea, 2006; Meyer, 2009).

Yet humans retain highly conspicuous patches of hair. The patterned distribution and sexual dimorphism of men's beards and body hair suggest that sexual selection has shaped their evolution, either as an attractive ornament to women or as a badge of status between men (Archer, 2009; Dixson, Dixson, & Anderson, 2005; Grueter, Isler, & Dixson, 2015; Puts, 2010). While female preferences for facial hair are partially heritable (Verweij, Burri, & Zietsch, 2012), the evidence that beards and body hair enhances men's attractiveness to heterosexual women is very mixed (for review, see Dixson & Rantala, 2016). In some studies, women prefer beards (Hatfield and Sprecher, 1986; Pellegrini, 1973; Reed and Blunk, 1990), while in others intermediate levels of stubble (Dixson & Brooks, 2013; Janif, Brooks, & Dixson, 2014; Neave & Shields, 2008), or clean-shaven faces (Dixson & Vasey, 2012; Geniole & McCormick, 2015; Muscarella & Cunningham, 1996). Likewise, women's preferences for chest hair range from pronounced in the UK (Dixson, Halliwell, East, Wignarajah, & Anderson, 2003), to moderate in Cameroon (Dixson, Dixson, Morgan, & Anderson, 2007),

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and hairless chests in the USA, New Zealand, China, Finland, Turkey, and Slovakia (Dixson, Dixson, Bishop, & Parish, 2010; Dixson, Dixson, Li, & Anderson, 2007; Prokop, Rantala, & Fančovičová, 2012; Prokop, Rantala, Usak, & Senay, 2013; Rantala, Pölkki, Rantala, Polkki, & Rantala, 2010). Besides the varying methods used between studies, these mixed findings may have arisen due to the associations between facial and body hair and perceptions of dominance and aggressiveness (Puts, 2010; Saxton, Mackey, McCarty, & Neave, 2016; Sherlock, Tegg, Sullikowski, & Dixson, 2016).

These equivocal patterns are similar to studies of women's preferences for men's facial masculinity, where some studies found that women preferred masculinized over less masculinized male faces (DeBruine, Jones, Crawford, Welling, & Little, 2010), while others reported stronger preferences for less masculinized male faces (Perrett et al., 1998) or no differences in preferences between more or less masculine male faces (Valentová, Roberts & Havlíček, 2013). Female preferences for male facial masculinity may be influenced by environmental variables, such as national health (DeBruine et al., 2010), the distribution of the trait in the given population (Scott et al., 2014), prevailing income inequality and socioeconomic development (Brooks et al., 2011), by individual differences in relationship status (Little, Jones, Penton-Voak, Burt, & Perrett, 2002) or fertility (Gildersleeve, Haselton, & Fales, 2014). Thus, the ambiguous findings of past studies on female preferences for male facial and body hair may be due, in part, to both population and individual level differences.

While preferences for masculine traits have been extensively studied among heterosexual women, there remains less information on preferences among homosexual men. From an evolutionary perspective, homosexual participants represent a unique opportunity to test whether evolved mating psychologies are specific to the sex of the individual or the sex of the preferred partner (Howard & Perilloux, 2016). For example, heterosexual men tend to prefer relatively younger female partners, while heterosexual women tend to prefer relatively older male partners (Kenrick & Keefe, 1992). Thus, if being male leads to higher preferences for younger partners, and being female leads to higher preferences for older partners, mate preferences should be sex-specific irrespective of sexual orientation. Alternatively, if preferences are specific to the target of sexual preferences, homosexual men should show concordance with heterosexual women in preferring older males as mates. Previous research reported that like heterosexual men, homosexual men placed a strong emphasis on youth and attractiveness in a potential mate (Hayes, 1995; Howard, Blumstein, & Schwartz, 1987; Muscarella, 2002; Silverthorne & Quinsey, 2000), and reported greater interest and involvement in more casual sexual relationships (Bailey, Gaulin, Agyei, & Gladue, 1994; Howard & Perilloux, 2016; Schmitt, 2007). This suggests that mechanisms of mating psychology are specific to the sex of the individual rather than the sex of the partner. Further, homosexual men prefer, on average, masculine physical characteristics in their ideal partners (Zheng & Zheng, 2015), partners of equal height or those taller than themselves (Valentova, Bártová, Štěrbová, & Varella, 2016; Valentova, Stulp, Třebický, & Havlíček, 2014), low-pitched voices (Valentová et al., 2013), and masculine faces (Glassenberg, Feinberg, Jones, Little, & DeBruine, 2010; Petterson, Dixson, Little, & Vasey, 2015, 2016; Zheng & Zheng, 2015). Thus, homosexual men tend to prefer sex-typical characteristics in their potential mates. However, preferences of homosexual men are also influenced by participants' own masculinity-femininity (Bailey, Kim, Hills, & Linsenmeier, 1997; Bártová et al., in press; Boyden, Carroll, & Maier, 1984), personality (Valentova, Štěrbová, Bártová, & Varella, 2016), and relationship status (Valentová et al., 2013).

To our knowledge, only one study among North American homosexual men has quantified preferences of facial and body hair (Muscarella, 2002). In that study, homosexual men preferred an average amount of body hair that was similar to their own and their partner's amount, suggesting a preference for self-similarity and concordance between preferences and actual partner choice. For facial hair, men desired significantly more facial hair than they had themselves or that their actual partners had (Muscarella, 2002). Although studies on mate preferences among homosexual men have been undertaken in various populations, such as China, the Czech Republic, or Great Britain, the US, direct cross-cultural comparisons are almost absent from the literature, as are comparisons between preferences of homosexual men and heterosexual women. Additionally, most studies have focused on preferences, rather than actual partner choices (for exceptions, see Muscarella, 2002; Valentova et al., 2014; Valentova, Bártová, Štěrbová, & Varella, 2016; Valentova, Štěrbová, Bártová, & Varella, 2016). However, mate preferences differ to some degree from actual mate choices, for instance in BMI (Courtiol, Raymond, Godelle, & Ferdy, 2010), personality (Overall, Fletcher, & Simpson, 2006), height (Valentova et al., 2014), and overall attractiveness (Todd et al., 2007). Moreover, homosexual men tend to state stronger preferences for masculine traits, in particular beards, in ideal compared to actual partners (Muscarella, 2002).

In the current study, we tested effects of sex and population on facial and bodily hirsutism in ideal and actual partners among homosexual men and heterosexual women from Brazil and the Czech Republic. Homosexual men might be expected to prefer and choose more masculine physical traits in ideal and actual partners, respectively, compared to heterosexual women. Further, we tested whether preferences for facial and body hair differ from the degree of facial and body hair in the actual partners of both groups of participants (homosexual men and heterosexual women). Because ideal preferences and actual partner choices may be influenced by the distribution of the particular trait in the given population (Janif, Brooks, & Dixson, 2015; Scott et al., 2014), we also tested whether the distribution of self-reported male facial and body hair differed between men from the two countries (Brazil and the Czech Republic). Furthermore, preferences for homogamy, which refers to the degree of self-resemblance in actual or preferred mates, occur for some characteristics among heterosexual individuals and opposite-sex couples (for a review, see Štěrbová & Valentová, 2012). Partner preferences and choices may also be shaped by early childhood experience, when individuals internalize parental characteristics that are used as a template for partner choice in adulthood. This mechanism is known as a sexual imprinting-like effect (for review, see Rantala & Marcinkowska, 2011). So far, homosexual individuals have been overlooked in the studies on both homogamy and imprinting-like effects. Here we tested effects of homogamy (self-similarity) and imprinting-like effects (father-similarity) on partner preferences and choices for beardedness and body hair among heterosexual women and homosexual men.

2. Methods

2.1. Participants

The total sample consisted of 2765 participants (mean age = 27.00 years, range 17–78, SD = 7.84) from the Czech Republic (mostly from Prague) and Brazil (mostly from São Paulo state and Brasília) who were recruited as part of a larger study measuring ideal partner preferences and actual partner choices. In both countries, participants were recruited primarily via snowball sampling through mailing-lists obtained from our previous studies, through posts on Facebook, and LGBT oriented Web pages. In the current analyses, we only included data from participants between 18–50 years old.

Participants declared their sexual orientation via the Kinsey scale (Kinsey, Pomeroy, & Martin, 1948). Women who reported they were exclusively heterosexual (66.6%, N = 589), predominantly heterosexual (28.8%, N = 255), and mostly heterosexual (4.5%, N = 40) were categorized as "heterosexual". Men who reported they were either exclusively heterosexual (43.3%, N = 309), predominantly heterosexual (8.7%, N = 62), and mostly heterosexual (2.9%, N = 21) were treated as "heterosexual" men in the analyses. Men who indicated they were somewhat homosexual (1.1%, N = 8), predominantly homosexual

(9.4% N = 67) and exclusively homosexual (31.7%, N = 226) were categorized as "homosexual".

The final sample included 1577 responses (mean age = 26.80 years, range 18–50, SD = 6.73); 171 heterosexual men (mean age = 27.57 years, range 18–47, SD = 5.48), 157 homosexual men (mean age = 28.27 years, range 18–50, SD = 6.85) and 467 heterosexual women (mean age = 28.56 years, range 18–50, SD = 7.86) from the Czech Republic, and 221 heterosexual men (mean age = 25.82 years, range 18–50, SD = 6.07), 144 homosexual men (mean age = 23.99 years, range 18–44, SD = 4.63) and 417 heterosexual women (mean age = 25.56 years, range 18–50, SD = 6.08) from Brazil.

Participants also stated whether they were currently in a stable relationship. In total, 51.5% (N = 153) of homosexual men and 65.9% (N = 562) of heterosexual women reported having a stable male partner at the time of the study, 48.5% (N = 144) of homosexual men and 34.1% (N = 291) of heterosexual women reported being single. We excluded 1 (0.3%) homosexual man who reported being in a stable relationship with a female partner, 2 (0.2%) heterosexual women who reported being in a relationship with a woman, and 3 (0.3%) women who reported being in a stable relationship with a man and a woman.

2.2. Facial hair and body hair stimuli

For the facial hair stimuli, we presented photographs of a male of European descent aged 26 years with dark brown hair and facial hair photographed with neutral facial expression in each of four conditions: clean-shaven, with 5 days (light stubble), 10 days of beard growth (heavy stubble) and fully bearded (8 weeks without shaving) (Dixson & Brooks, 2013). Photographs were taken using a Canon digital camera (8.0 megapixels resolution), 150 cm from the participant under controlled lighting. Images were cropped, so only the face and neck were shown (Fig. 1).

Preferences for body hair were assessed using front-posed male images varying in degrees of hirsuteness on the trunk (chest and abdomen). Five images of a front-posed mesomorphic male varying in degree of hirsuteness were presented in an order from least to most body hair (Dixson et al., 2010). Images of mesomorphic males figures were used because mesomorphy is rated as highly attractive by heterosexual women and homosexual men (Dixson, Grimshaw, Ormsby, & Dixson, 2014; Zheng & Zheng, 2015). The distribution of chest and abdominal hair was altered in a stepwise fashion from none to pronounced hirsutism using Photoshop v7.0 (Dixson et al., 2010; Fig. 1).

2.3. Procedure

Data were collected through an online questionnaire using Qualtrics, Inc. software (www.qualtrics.com). At the start of the survey, participants gave their informed consent, after which they were asked to provide demographic data, sexual and relationship history, self-ratings, and ratings of characteristics of potential and actual partners. Participants were presented with stimulus arrays depicting variation in facial hair and body hair (Fig. 1) and were asked to select the face or body they would prefer in an ideal partner. Participants who were currently in a stable relationship were also asked to select the image that best reflected the amount of facial and body hair in their actual partner, and if they remembered their father during their childhood (i.e., up to 12 years), they were also asked to choose the image that best reflected the amount of beard and body hair in their fathers during participants childhood. Heterosexual and homosexual men were asked to select the picture that best reflected their own amount of beard and body hair. The order of the questions was fully randomized.

2.4. Statistical analyses

To test the effect of sex and population on preferences and choices, we performed two generalized linear models (GZLM) for ordinal data with preferred or actual amount of beard of body hair as a dependent variable, population (Brazil x the Czech Republic), and sex (homosexual male x heterosexual female) as fixed factors and age as a covariate. To compute differences between preferred and actual physical traits, we performed non-parametric related-samples Wilcoxon Signed Rank Tests separately for men and women, first for participants from both populations, and then separately for each population.

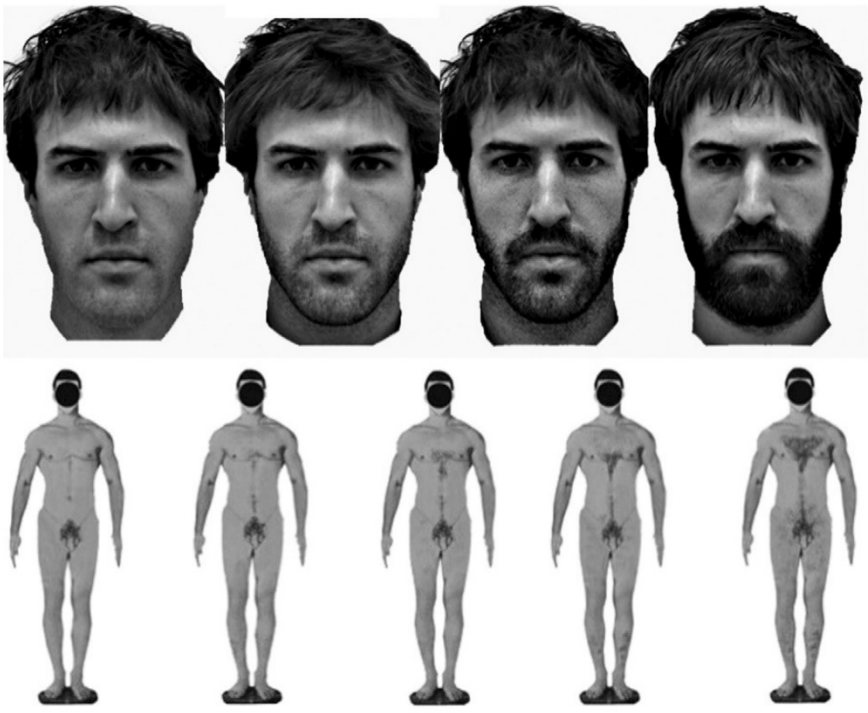

Fig. 1. Stimuli depicting different levels of facial and body hair used in this study.

To examine differences in self-reported beard and body hair between populations and men of different sexual orientations, we performed two generalized linear model (GZLM) for ordinal data with facial and body hair as dependent variables, country and sexual orientation as factors, and age as a covariate. To test for any concordance between ideal and actual partner's facial and body hair against that of their fathers during their childhood, we performed Spearman correlations between these variables for men and women separately. Spearman correlations were also used to investigate possible association between preferred and actual facial and body hair and self-reported facial and body hair of male participants.

3. Results

3.1. Effect of sex, sexual orientation, and population on partner preferences

The GZLM models were significant for both preferred facial hair (likelihood ratio $\chi^2 = 94.00$, df = 3, p < .001), and body hair (likelihood ratio $\chi^2 = 38.20$, df = 3, p < .001). The parameter estimates showed a significant effect of country (B = 1.022, SE = .13, Wald Chi square = 66.99; $p < .001$) and sex (B = .431, SE = .14, Wald Chi square = 10.22; $p < .001$) on facial hair preferences. Brazilian participants preferred more facial hair than Czech participants, and homosexual male participants preferred, on average, more facial hair than heterosexual women. The parameter estimates for body hair model showed a significant effect of sex (B = .541, SE = .14, Wald Chi square = 15.99; $p < .001$) but not country (B = .207, SE = .12, Wald Chi square = 3.16; $p = .075$) on body hair preferences.

Homosexual men preferred, on average, more body hair than heterosexual women. A significantly larger proportion of homosexual men than women preferred men with full beards and pronounced body hair, particularly among Brazilian participants (Fig. 2; Table 1a, Table 1b). However, partner preferences were very diverse within the homosexual male groups. For example, 20% of Brazilian men preferred a clean shaved face and 15% preferred a full beard, while percentages of these selections in Brazilian women were 25% and 6%, respectively. A similar pattern was found for body hair preferences, where 24% of homosexual men preferred a hairless body and 17% of men preferred pronounced body hair, while in women the percentages of selections of these stimuli were 35% and 3%, respectively. Similarly, a substantial

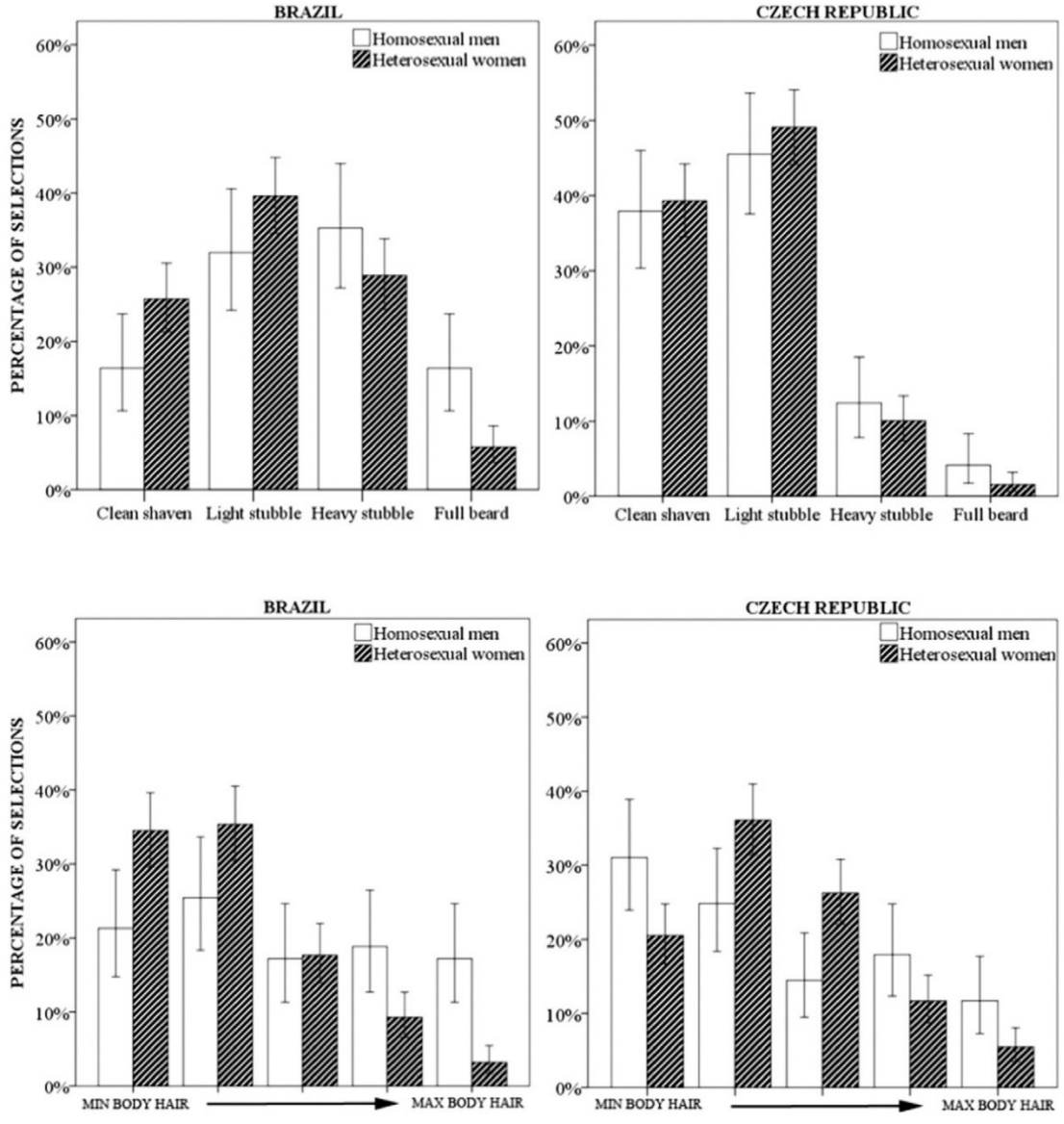

Fig. 2. a) Frequencies of preferred facial hair divided by population and sex. Error bars represent 95% CI. b) Frequencies of preferred body hair divided by population and sex. Error bars represent 95% CI.

Table 1a
Frequencies of preferred facial hair and reported facial hair in actual partners divided by population and sex.

		Czech		Brazilian		Total	
		Men N (%)	Women N (%)	Men N (%)	Women N (%)	Men N (%)	Women N (%)
Clean-shaved	Preferred partner	54 (38.3%)	151 (39.3%)	20 (16.5%)	84 (24.9%)	74 (28.2%)	235 (32.6%)
	Actual partner	50 (56.2%)	141 (45.9%)	16 (30.2%)	96 (43.0%)	66 (46.5%)	237 (44.7%)
Light stubble	Preferred partner	63 (44.7%)	189 (49.2%)	39 (32.2%)	134 (39.8%)	102 (38.9%)	323 (44.8%)
	Actual partner	30 (33.7%)	94 (30.6%)	19 (35.8%)	65 (29.1%)	49 (34.5%)	159 (30.0%)
Heavy stubble	Preferred partner	18 (12.8%)	38 (9.9%)	42 (34.7%)	99 (29.4%)	60 (22.9%)	137 (19.0%)
	Actual partner	8 (9.0%)	58 (18.9%)	15 (28.3%)	45 (20.2%)	23 (16.2%)	103 (19.4%)
Full beard	Preferred partner	6 (4.3%)	6 (1.6%)	20 (16.5%)	20 (5.9%)	26 (9.9%)	26 (3.6%)
	Actual partner	1 (1.1%)	14 (4.6%)	3 (5.7%)	17 (7.6%)	4 (2.8%)	31 (5.8%)

proportion of Czech homosexual men showed preferences for hairless appearance. Thus, mean preferences should be interpreted with caution.

3.2. Effect of sex, sexual orientation, and population on actual partner choices

The GZLM model for facial hair of the actual partners was significant (likelihood ratio $\chi^2 = 13.88$, df = 3, p = .003), but the model for body hair was not significant (likelihood ratio $\chi^2 = 3.82$, df = 3, p = .282). The parameter estimates showed a significant negative effect of age (B = −.025, SE = .009, Wald Chi square = 6.33; $p = .012$), no significant effect of country (B = .288, SE = .15, Wald Chi square = 3.77; $p = .052$), and no effect of sex (B = .183, SE = .17, Wald Chi square = 1.11; $p = .293$) on reported facial hair of actual partners (Table 1b).

3.3. Differences between preferences and actual partner's beard and body hair

Among homosexual men there was a significant difference in facial hair between their preferred and actual partners (W = 409.00, N = 126, $p < .001$). Men preferred thicker facial hair than their partners had. When broken down according to population, this result applied to both Brazilian men (W = 39.50, N = 42, $p = .019$) and the Czech men (W = 200.00, N = 84, $p = .001$). For body hair preferences, there was no difference between male preferences and their actual partners (W = 2079.00, N = 126, $p = .955$), among both Brazilian (W = 259.00, N = 42, $p = .696$) and Czech men (W = 882.50, N = 84, $p = .832$). In women, there was no significant difference between preferred and actual beardedness (W = 9694.00, N = 465, $p = .146$). However, this result applied only to the Czech women (W = 3838.50, N = 281, $p = .250$), while Brazilian women desired denser facial hair than their partners had (W = 1320.50, N = 184, $p = .001$). Women desired less body hair than their partners had (W = 22,451.00, N = 465, $p < .001$) in both Brazilian (W = 4550.50, N = 184, $p < .001$), and the Czech (W = 6715.50, N = 281, $p = .041$) samples.

3.4. Cross-cultural comparisons of self-reported beard and body hair volume in heterosexual and homosexual men

To test whether cross-cultural differences in preferences and choices relate to the population frequency of the given traits, we analyzed self-reported facial and body hair of homosexual and also heterosexual men from both populations. The GZLM for self-reported facial hair was significant (likelihood ratio chi-square = 36.40, df = 3, p < .001), as well as the model for self-reported body hair (likelihood ratio chi-square = 11.41, df = 3, p = .010). The parameter estimates showed a significant effect of country (B = .866, SE = .16, Wald Chi Square = 28.77, p < .001), sexual orientation (B = .325, SE = .15, Wald Chi Square = 4.56, p = .033) and a positive effect of age (B = .034, SE = .01, Wald Chi Square = 6.40, p = .011) on self-reported facial hair. Czech men reported having less facial and body hair than Brazilian men, and homosexual men reported having significantly less facial hair than heterosexual men. The parameter estimates showed a significant positive effect of age on self-reported body hair (B = .40, SE = .01, Wald Chi Square = 9.87, p = .002) but no effect of country (B = .248, SE = .15, Wald Chi Square = 2.62, p = .106) or sexual orientation (B = .160, SE = .15, Wald Chi Square = 1.19, p = .275).

3.5. Facial and body hair in ideal and actual partners, fathers, and own facial and own body hair in homosexual men

Spearman's correlations revealed a positive association between self-reported beardedness and preferences for beard volume in both Brazilian ($\rho = .224$, N = 121, p = .013) and Czech ($\rho = .403$, N = 141, p < .001) homosexual men. However, correlations between self-reported body hair and preferences for body hair in an ideal partner did not reach significance level in either Brazilian or Czech men. Likewise, there was no association between their fathers' and ideal partners' facial and body hair. In Czech women, we found a positive weak association between preferred beard volume and fathers' beard volume ($\rho = .127$, N = 348, p = .018), but there was no other significant association with fathers' appearance. Overall, there were no statistically significant associations between fathers' or self-reported appearance and actual partners.

Table 1b
Frequencies of preferred body hair and reported body hair in actual partners divided by population and sex.

		Czech		Brazilian		Total	
		Men N (%)	Women N (%)	Men N (%)	Women N (%)	Men N (%)	Women N (%)
Body hair 1	Preferred partner	42 (29.8%)	79 (20.7%)	26 (21.5%)	116 (34.5%)	68 (26.0%)	195 (27.2%)
	Actual partner	22 (24.7%)	79 (25.7%)	13 (25.0%)	41 (18.6%)	35 (25.0%)	120 (22.7%)
Body hair 2	Preferred partner	35 (24.8%)	139 (36.4%)	31 (25.6%)	119 (35.4%)	66 (25.2%)	258 (35.9%)
	Actual partner	24 (27.0%)	74 (24.1%)	9 (17.3%)	62 (28.1%)	33 (23.6%)	136 (25.8%)
Body hair 3	Preferred partner	21 (14.9%)	100 (26.2%)	21 (17.4%)	59 (17.6%)	42 (16.0%)	159 (22.1%)
	Actual partner	14 (15.7%)	61 (19.9%)	7 (13.5%)	52 (23.5%)	21 (15.0%)	113 (21.4%)
Body hair 4	Preferred partner	26 (18.4%)	44 (11.5%)	22 (18.2%)	31 (9.2%)	48 (18.3%)	75 (10.4%)
	Actual partner	14 (15.7%)	45 (14.7%)	12 (23.1%)	24 (10.9%)	25 (17.9%)	69 (13.1%)
Body hair 5	Preferred partner	17 (12.1%)	20 (5.2%)	21 (17.4%)	11 (3.3%)	38 (14.5%)	31 (4.3%)
	Actual partner	15 (16.9%)	48 (15.6%)	11 (21.2%)	42 (19.0%)	26 (18.6%)	90 (17.0%)

4. Discussion

The current study reports on preferences for facial and body hair among homosexual men and heterosexual women in two ethnically and culturally diverse populations, Brazil and the Czech Republic. Homosexual men, on average, preferred hairier stimuli than women, supporting their higher preferences for overall masculinity. Male preferences in both populations were more equally distributed among the stimuli, while women showed weak preferences for hairy faces and bodies. Thus, homosexual male preferences cannot be stereotypically reduced to a gender atypical or heterosexual female pattern of preferences, instead preferences for facial and body hair depend on sex. Previous studies have reported that facial hair in men is associated with age, dominance, and aggressiveness (Dixson & Vasey, 2012; Neave & Shields, 2008; Sherlock et al., 2016). Thus, the equivocal nature of women's preferences for facial and body hair may reflect a compromise between preferences for sexual maturity and prosocial characteristics (Dixson & Brooks, 2013; Neave & Shields, 2008). In contrast, homosexual men may adopt indirect reproductive strategies (VanderLaan, Ren, & Vasey, 2013) and hence may bypass some of the negative associations with phenotypic masculinity.

According to the theory of homogamy or self-similarity (for a review, see Štěrbová & Valentová, 2012) hairier men might be expected to prefer and couple with men with similar levels of facial and body hair. Indeed, previous studies reported that homosexual men who described themselves as masculine prefer potential partners with more masculine characteristics (Bailey et al., 1997). Further, homosexual men and women preferred, on average, partners with body heights that were equal to their own, while heterosexual women preferred their male partners to be taller than themselves (Valentova et al., 2014; Valentova, Bártová, Štěrbová, & Varella, 2016). We found that both Brazilian and Czech homosexual men had self-similar preferences for facial hair, but not body hair in a partner. Taken together, these findings provide some support for previous evidence for homogamy in some physical traits among homosexual men and heterosexual women across different populations.

Imprinting-like effects, wherein parental characteristics are sought out in partners, may be involved in partner choice (Rantala & Marcinkowska, 2011). However, for the most part we found no associations between fathers and ideal/actual partners facial and body hair. An exception was found among Czech women, where a weak but positive effect of fathers' beardedness on beard preferences was found. This is similar to a previous study showing a weak imprinting-like effects on beard preferences in New Zealand (Dixson, Tam, & Awasthy, 2013) and in a large on-line study (Janif et al., 2014). Rantala et al. (2010) found a positive relationship between preferences for body hair and father's degree of body hair among heterosexual women in Finland. However, subsequent studies among Slovak and Turkish women did not replicate this finding (Prokop et al., 2013). Rantala et al. (2010) also reported a positive correlation between paternal body hair and partner's degree of body hair. In our study, with the exception of Czech women, participants desired male partners with slightly more facial hair than their actual partners had. Although preferences for body hair did not differ significantly from the amount of body hair of their actual partners among homosexual men, women from both populations desired male partners with less body hair than their partners had. While homosexual men reported preferences for homogamy in facial hair, these preferences were not reflected in their actual partner choices. Similarly, the weak imprinting-like effects for facial hair preferences among women did not translate into their actual mate choices. Thus, preferences appear to only partially reflect actual mate choices, possibly because people compromise their ideal partner against that which is available (Todd et al., 2007), and imprinting-like effects concerning beards and body hair, if present at all, are weak, differ cross-culturally and may not relate to actual partner choices.

We also found differences in partner preferences between the two studied populations. Brazilian participants preferred more facial hair and described their actual partners as having more facial hair than Czech participants. To test whether differences between populations were associated with the frequency of the trait in the given population, we investigated self-reported physical characteristics among heterosexual and homosexual men from both populations. Brazilian male participants reported having more facial hair than the Czech participants, with no differences in body hair. Thus, the difference between populations in facial hair preferences and actual choices may be positively associated with local levels of beardedness described by the familiarity effect. However, the cultural factors shaping men's decisions to groom their facial hair have only recently begun to receive attention (Janif et al., 2014) and in order to test whether ecological, cultural and economic factors shape masculinity and beardedness, and preferences for them, a much larger cross-cultural comparison is needed.

We note that there were several limitations to our study. Firstly, while Internet-based surveys allow for large sample sizes to be more easily collected than when using offline methods, these methods are also a limitation in our study. For instance, a study in El Salvador found that preferences for facial masculinity differed between men and women without access to the Internet and men and women with access to the Internet (Batres & Perrett, 2014). Although the majority of the populations in both countries in our study have Internet access, caution should be exercised when discussing our findings as being fully representative of either population. Further, while we used natural stimuli to measure preferences for facial hair, we utilized a small number of stimuli and the categories we offered do not capture the full range in beard styles and fashions within each population. Moreover, using just one stimulus does not enable to investigate possible interactions between stimulus and manipulation. Women may make trade-offs between different androgen-dependent traits when judging male attractiveness (Hill et al., 2013), so that facial hair might interact with facial masculinity to determine how men's facial attractiveness is judged (Neave & Shields, 2008; Dixson & Brooks, 2013). Two studies have tested the effects of underlying facial masculinity on women's preferences for male facial hair. One study reported that full beards were rated slightly more attractive on faces that were somewhat less masculine compared to bearded faces that were highly masculine (Dixson, Sullikowski, Gouda-Vossos, Rantala, & Brooks, 2016). Similarly, in studies in which male jaw size was experimentally manipulated, women's preferences were higher for bearded faces with small jaws compared to bearded and clean-shaven faces with large jaws (Dixson, Lee, Sherlock, & Talamas, 2016). To measure preferences for body hair we relied on schematic drawings depicting different distributions of the body hair. While we recognize that natural stimuli provide more realistic tests (Dixson & Rantala, 2016; Prokop et al., 2013; Rantala et al., 2010), the distribution of hair in our computer-generated stimuli are analogous to those of natural stimuli (Dixson & Rantala, 2016). Finally, the self-reported data on facial and body hair of our participants' actual partners may also have produced biased reports as there is some evidence that individuals assess their partners as more similar to themselves than they actually are (e.g., Buunk & Bosman, 1986). Thus, future studies using self-reports from partners would be valuable. Finally, it should be noted that the effect sizes reported in this study are small, and thus the group differences should be interpreted with caution.

For the present, our findings highlight the importance of cross-cultural comparisons among heterosexual and homosexual participants to characterize the factors underpinning preferences for sexually dimorphic traits. We found that preferences for two sexually dimorphic physical traits (facial and body hair) can be influenced by sex rather than sexual orientation as well as prevailing social factors, including the frequency of the trait in the population. We found only weak evidence for imprinting-like effects on preferences that was unrelated

to actual partner choices. Importantly, research using twin studies have reported that a much larger proportion in the variance in women's preferences for facial masculinity is explained by shared genetic background rather than individual differences in sociosexuality, pathogen disgust and fertility (Zietsch, Lee, Sherlock, & Jern, 2015). Given that female preferences for facial hair are partially heritable (Verweij et al., 2012) and our results suggest some aspects of social learning underpin variation in preferences, future research disentangling the strength of shared genetic and environmental factors on preferences for facial and body hair would be valuable.

Supplementary materials

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.evolhumbehav.2016.10.007.

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Příloha VII

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Influence of sexual orientation, population, homogamy, and imprinting-like effect on preferences and choices for female buttock size, breast size and shape, and WHR

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ABSTRACT

Secondary sexual characteristics that are consistently noticed by individuals of the opposite sex (e.g., female breasts) have been shown to be linked to individual qualities, such as health and/or fertility. However, it is not clear whether homosexual individuals seek similar traits in their potential partners as their heterosexual counterparts. Here we investigated preferences and choices for female buttock size, breast size and shape, and WHR among non-heterosexual women and heterosexual men in two diverse populations, Brazil and the Czech Republic. On average, participants mostly preferred younger-looking female breasts, medium to bigger buttock and breast size, and WHR of 0.7. However, men preferred bigger buttocks and breasts, and smaller WHR than women. Possibly, non-heterosexual women have lower motivation to search for indicators of fecundity and fertility in their potential female partners. Further, Brazilians preferred larger breasts and buttocks than Czechs, although there was no difference in preferred breast shape and WHR. We also found evidence for preferred homogamy and an imprinting-like effect among men and women. In general, preferences differed from actual choices. In sum, personal experience (imprinting-like effect), own characteristics (own physical traits, sexual orientation) and external factors (population) can calibrate individual differences in preferences for specific physical traits.

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1. Introduction

Secondary sexual characteristics that are consistently noticed by individuals of the opposite sex have been shown to be linked to individual qualities, such as health and/or fertility. For instance, relatively low waist-to-hip ratio (WHR) in women was correlated with higher concentrations of estradiol and progesterone, i.e. predictors of conception probability, suggesting WHR can serve as a marker of fecundity (Jasienska, Ziomkiewicz, Ellison, Lipson, & Thune, 2004). Indeed, relatively low WHR close to 0.7 was shown to be cross-culturally rated as the most attractive (e.g., Dixson, Li, & Dixson, 2010; Singh, 1994; Sorokowski & Sorokowska, 2012).

Similarly, breast shape that changes, among others, with age and parity (Rinker, Veneracion, & Walsh, 2010) was suggested to indicate residual reproductive value, or the expected future reproductive output of an individual (Marlowe, 1998). In support, a recent study showed unambiguous male preferences for younger looking female breast shape in four different cultures (Havlíček et al., under review).

Further, large breast size was shown to be associated with higher concentrations of ovary hormones, suggesting it can serve as a marker of fecundity, similarly to WHR (Jasienska et al., 2004; although see, Grillot, Simmons, Lukaszewski, & Roney, 2014). Nevertheless, some studies have shown that small size breasts are the most preferred by men (Furnham & Swami, 2007; Jones, 1996), while other studies indicated preferences for medium (or medium to large) size (Dixson, Duncan, & Dixson, 2015; Dixson, Grimshaw, Linklater, & Dixson, 2011), rather large size (Furnham, Dias, & McClelland, 1998; Zelazniewicz & Pawlowski, 2011), or no size effect on breast attractiveness ratings (Dixson et al., 2011; Grillot et al., 2014). Such inconsistencies can be partly given by methodological differences between the studies, by cultural variation in preferences (Dixson et al., 2011; Havlíček et al., under review), and also by inter-individual differences.

Some studies also showed variation in attractiveness ratings of female buttock size. A study based on a Brazilian sample showed that men preferred rather larger than average buttock size (Jones, 1996),

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Table 1
Description of the final sample.

	Heterosexual men			Non-heterosexual women			Heterosexual women			Total
	Brazil	CZ	Total	Brazil	CZ	Total	Brazil	CZ	Total	
N	218	164	382	93	132	225	407	446	853	1460
Mean age (SD)	25.82 (6.12)	27.49 (5.35)	26.54 (5.84)	23.89 (5.14)	25.96 (6.94)	25.11 (6.34)	27.49 (5.35)	28.49 (7.86)	27.10 (7.21)	26.65 (6.78)
% of singles	47.7%	50.6%	49%	44.1%	41.7%	42.7%	43.2%	25.8%	34.1%	39.3%

while another study did not show any effect of buttock size on attractiveness ratings among a British student population (Furnham & Swami, 2007). Further, Hadza hunter-gatherers from Tanzania preferred more protruding buttocks than American men (Marlowe, Apicella, & Reed, 2005). Such variation in preferences can reflect the distribution of the given trait in the population and also specific demands of the local ecology and life-style (Marlowe et al., 2005).

The above-mentioned studies focused primarily on preferences of heterosexual men, however, little is known about preferences for physical traits in non-heterosexual (i.e., lesbian and bisexual) women. As shown, partner preferences of non-heterosexual women can differ from those of heterosexual men. Non-heterosexual women and men prefer self-similar height while heterosexual women and men prefer 'male-taller pattern' (Valentova, Bártová, Štěrbová, & Varella, 2016).

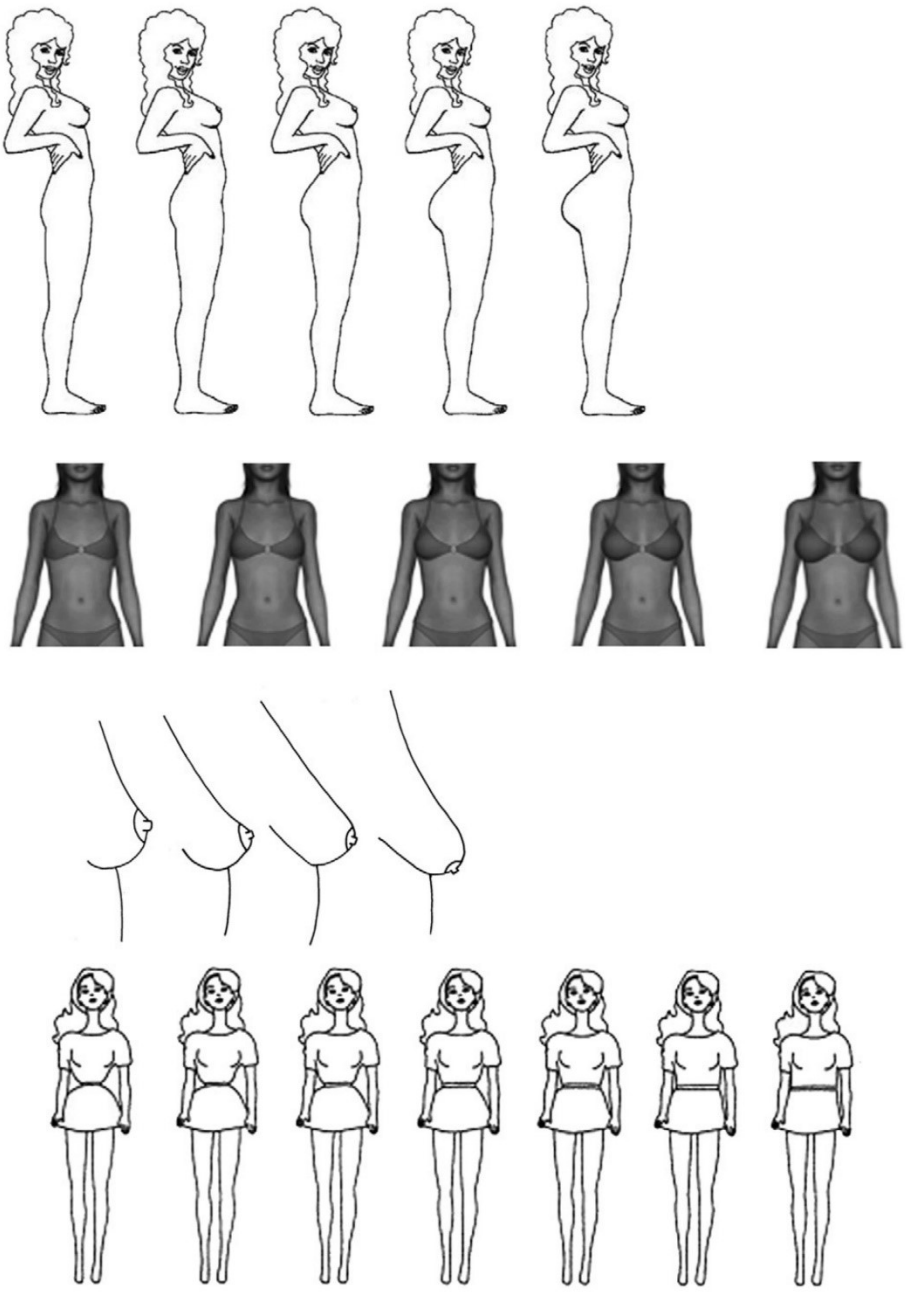


Fig. 1. Stimuli used in this study, top-down: buttocks size, breast size, breast shape (ptosis), and waist-to-hip ratio (WHR).

Similarly, non-heterosexual women prefer female partners of a similar age (Kenrick, Keefe, Bryan, Barr, & Brown, 1995), rather higher BMI than heterosexual men and women (Swami & Tovée, 2006), and in general bigger breast size and, as for heterosexual men and women, WHR of 0.7 (Cohen & Tannenbaum, 2001). Some of the studies showed preferences for self-similar traits (height and age), however, it is a matter of debate whether homogamy applies to other physical traits. Furthermore, an imprinting-like effect on parental characteristics during ontogeny was shown to influence individual partner preferences in the heterosexual population (for review, see Rantala & Marcinkowska, 2011). To our knowledge, there is no study on an imprinting-like effect in non-heterosexual women.

1.1. Aims of the current study

We aimed to investigate preferences for, and actual choices, of buttock size, breast size and shape, and WHR among heterosexual men and non-heterosexual women from Brazil and the Czech Republic. Subsequently, we tested whether preferences for the studied physical characteristics were translated into actual mate choices.

To test whether preferences and choices are affected by the distribution of the studied traits in the two populations, we examined possible differences in self-reported buttock size, breast size and shape, and WHR between populations and women of different sexual orientations.

Finally, we tested homogamy (self-similarity) and imprinting-like (mother-similarity) effects on partner preferences and choices by comparing respondents' ideal and actual partners' physical traits against that of their mothers and women's own physical attributes.

2. Methods

2.1. Participants

The initial sample consisted of 2240 participants. We excluded participants who did not finish responding to the questionnaires (n = 412), all male participants who indicated they were bisexual or homosexual (n = 327), respondents older than 50 years old (n = 27), 4 men who reported being heterosexual but had a stable relationship with a man, 2 heterosexual women who had a relationship with a woman, and 3 heterosexual men, 3 heterosexual and 2 non-heterosexual women who had a stable relationship with a man and a woman at the same time.

The final sample included 1460 responses (mean age = 26.6 years, range 18–50, SD = 6.78); 382 heterosexual men, 225 non-heterosexual women and 853 heterosexual women from Brazil and the Czech Republic (see Table 1). Heterosexual women were recruited in order to test differences between populations in self-ascribed physical traits.

Participants also stated whether they were currently in a stable relationship. In total, 51.0% (N = 195) of heterosexual men and 65.9% (N = 562) of heterosexual women had a stable partner of the opposite sex, while 38.7% (N = 87) of non-heterosexual women had a stable relationship with a woman and 18.7% (N = 42) of non-heterosexual women had a stable relationship with a man, 42.7% (N = 96) were single.

Table 3
Effect of sex and population on partner preferences.

	Sex				Population			
	B	SE	Wald χ^2	p	B	SE	Wald χ^2	p
Buttock size	0.463	0.19	6.14	0.013	1.314	0.19	49.08	0.000
Breast size	0.740	0.18	16.63	0.000	0.808	0.17	21.36	0.000
Breast shape	ns							
WHR	0.768	0.18	17.64	0.000	0.174	0.17	1.07	0.301

Note. Sex = heterosexual men × non-heterosexual women; Population = Brazil × the Czech Republic; B = ordinal regression coefficient, SE = Standard Error, p = significance level.

2.2. Stimuli

To assess attractiveness perceptions based on buttock size, we used five line drawings of one woman in profile view with varying from small to large buttocks size (Marlowe et al., 2005). Stimuli on breast size depicting five computer based graphics changing in breast size from small to large were taken from Swami and Tovée (2013). The stimuli on breast shape variation consisted of four profile drawings (Rawson & Brooks, 1984) that depict gradually increasing ptosis, defined as sagging process where the breasts fall on the chest, flatten and point downward (Rinker et al., 2010). Ptosis that represents a specific type of breast shape change, is related to age, number of pregnancies, breast size, and other factors, such as smoking or changes in body weight (Rinker et al., 2010). Finally, to test for preferences of WHR we used seven line drawings depicting WHRs ranging from 0.4 to 1.0 (Marlowe & Wetsman, 2001). These four stimuli were presented separately to minimize correlations between variables. See Fig. 1 illustrating the stimuli used.

2.3. Procedure

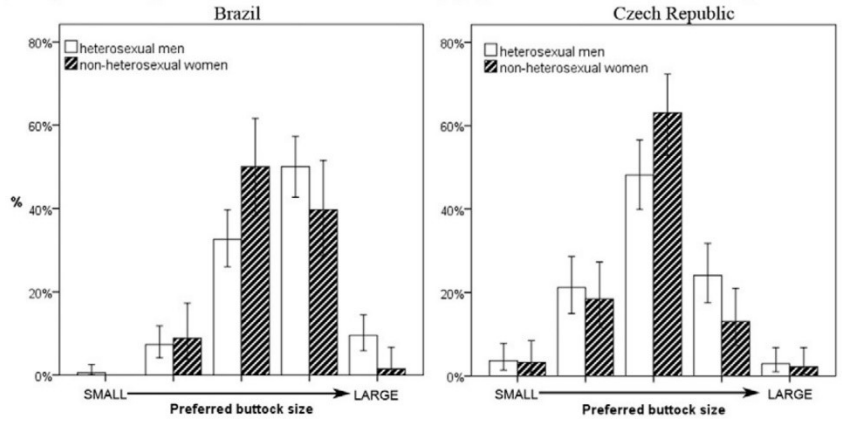
In both countries, participants were recruited primarily via snowball sampling through mailing-lists obtained from our previous studies, posts on Facebook, and LGBT oriented webpages. Data were collected

Table 2
Non-parametric correlations among dependent variables. The values are given in Spearman's ρ. Male ratings are presented above the diagonal, female ratings below the diagonal.

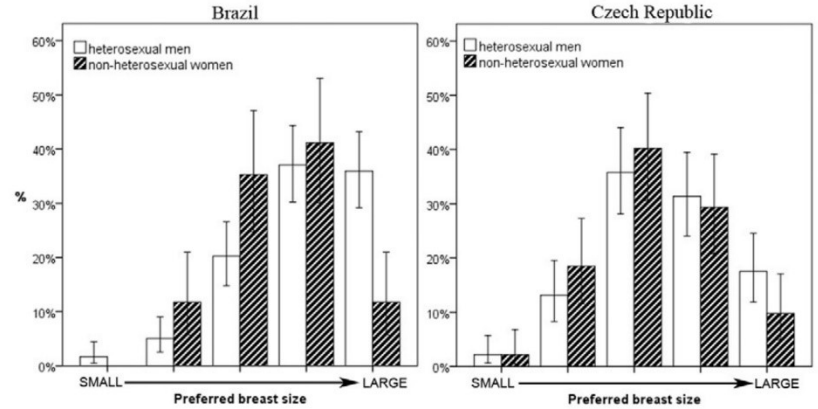
	Brazilian				Czech			
	1	2	3	4	1	2	3	4
1-Preferred buttock size	–	0.47***	−0.15*	−0.21**	–	0.38*	−0.18*	0.05
2-Preferred breast size	0.09	–	−0.08	−0.11	0.33***	–	−0.16	−0.01
3-Preferred breast shape	0.05	0.27*	–	0.15*	0.06	0.07	–	−0.04
4-Preferred WHR	−0.22*	−0.05	0.25*	–	0.09	−0.12	0.04	–
1-Actual buttock size	–	−0.01	−0.01	−0.08	–	0.26*	0.09	0.13
2-Actual breast size	−0.09	–	0.15	0.09	0.27	–	0.08	0.12
3-Actual breast shape	−0.04	0.03	–	0.21*	0.20	0.44**	–	−0.06
4-Actual WHR	−0.05	0.35	0.28	–	−0.03	−0.06	0.20	–
1-Mother's buttock size	–	0.22**	–	−0.04	–	0.39***	–	0.33***
2-Mother's breast size	0.20	–	–	0.26**	0.26**	–	–	0.42***
4-Mother's WHR	−30*	0.15	–	–	0.26**	0.29**	–	–
1-Own buttock size	–	–	–	–	–	–	–	–
2-Own breast size	0.35**	–	–	–	0.21*	–	–	–
3-Own breast shape	0.16	0.43***	–	–	0.14	0.55***	–	–
4-Own WHR	0.21	0.16	0.12	–	0.05	0.18	0.32**	–

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

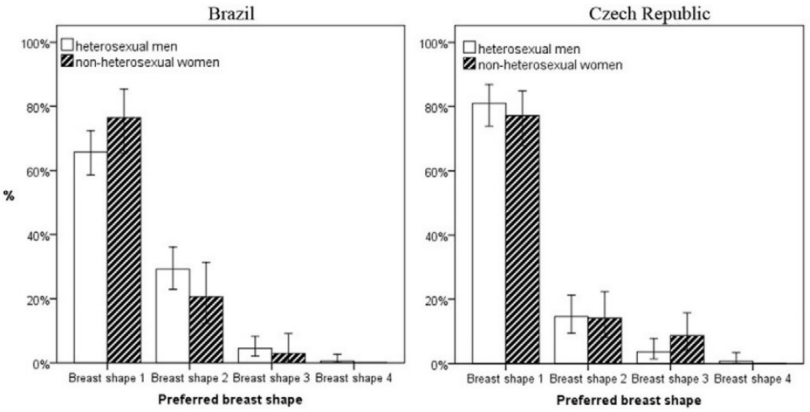
a) Frequencies of preferred **buttock size** divided by population and sex. Error bars represent 95% CI.



b) Frequencies of preferred **breast size** divided by population and sex. Error bars represent 95% CI.



c) Frequencies of preferred **breast shape** divided by population and sex. Error bars represent 95% CI.



d) Frequencies of preferred **WHR** divided by population and sex. Error bars represent 95% CI.

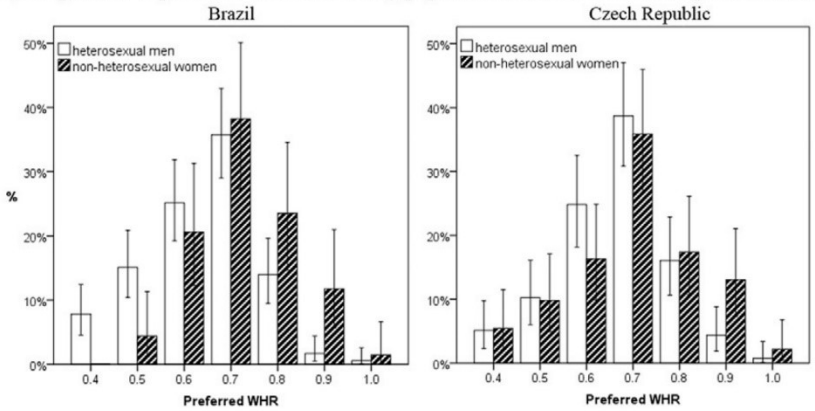


Fig. 2. Frequencies of preferred buttock size, breast size and shape, and WHR, top-down.

using online questionnaires constructed via Qualtrics, Inc. software. The study was part of a larger project aimed at mate preferences and choices (Valentova et al., 2016; Valentova, Štěrbová, Bártová, & Varella, 2016), and only data relevant for this study are presented below.

Participants gave their informed consent after which they provided demographic data, sexual and relationship history, self-reports, and reports of characteristics of ideal partners. Participants in a stable relationship were also asked to select the image that best reflected the body traits in their actual partner, and if they remembered their mother during their childhood, they were asked to choose the image that best reflected her body traits. Heterosexual and non-heterosexual women were asked to select stimuli that best reflected their own body characteristics in order to test the frequency of the studied traits in the given population. The order of the questions was randomized.

2.4. Statistical analyses

To test for differences between populations and sexes, we performed multiple Generalized linear models (GZLM) for ordinal data with preferred/actual buttock size, breast size and shape, and WHR as dependent variables, population (Brazil × the Czech Republic), and sex (heterosexual male x non-heterosexual female) as fixed factors and age as a covariate. Differences between preferred and actual physical traits were performed by non-parametric Mann-Whitney *U* tests separately for men and women.

To test whether cross-cultural differences in preferences and choices relate to the population frequency of the given traits, we fitted a GZLM for ordinal data with self-reported physical traits as dependent variables, population and sexual orientation as fixed factors, and age as a covariate.

Finally, to test the influence of homogamy and an imprinting-like effect, we performed non-parametric Spearman correlations between self-reports and preferred/actual partners' physical traits, and between mothers' and preferred/actual partners' physical traits.

Table 2 presents explorative non-parametric correlations among dependent variables.

3. Results

3.1. Effect of sex and population on partner preferences

The GZLM models were significant for preferred buttock size (Likelihood Ratio $\chi^2 = 64.93$, df = 3, $p < 0.001$), breast size (Likelihood Ratio $\chi^2 = 46.60$, df = 3, $p < 0.001$) and WHR (Likelihood Ratio $\chi^2 = 22.34$, df = 3, $p < 0.001$), but not for breast shape (Likelihood Ratio $\chi^2 = 7.56$, df = 3, $p = 0.056$).

As shown in Table 3, the models showed significant main effects of sex on preferences for buttocks and breasts size, and WHR. Heterosexual men preferred, on average, bigger buttocks and breasts, and lower WHR than non-heterosexual women. Further, population affected preferences for buttocks and breasts size. Brazilian participants preferred, on average, bigger buttocks and breasts than the Czech participants. For frequencies of the preferred physical trait, see Fig. 2.

3.2. Effect of sex and population on reported characteristics of actual female partners

The GZLM models were significant for preferred buttock size (Likelihood Ratio $\chi^2 = 16.29$, df = 3, $p = 0.001$), breast shape (Likelihood Ratio $\chi^2 = 16.57$, df = 3, $p = 0.001$) and WHR (Likelihood Ratio $\chi^2 = 24.56$, df = 3, $p < 0.001$), but not for breast size (Likelihood Ratio $\chi^2 = 7.56$, df = 3, $p = 0.056$).

As shown in Table 4, the models showed significant main effects of sex on preferences for breast shape, WHR, and a non-significant effect on buttocks size. Heterosexual men described their female partners, on average, as having lower breast ptosis, lower WHR and bigger buttocks than non-heterosexual women. Further, population affected reported buttocks size in actual female partners. Brazilian participants described their partners, on average, as having bigger buttocks than the Czech participants.

Table 4
Effect of sex and population on reported characteristics of actual female partners.

	Sex				Population			
	B	SE	Wald χ^2	p	B	SE	Wald χ^2	p
Buttock size	0.492	0.25	3.79	0.052	0.643	0.24	7.36	0.007
Breast size	ns							
Breast shape	0.829	0.26	9.95	0.002	0.035	0.24	0.021	0.884
WHR	0.742	0.25	8.76	0.003	0.318	0.23	1.96	0.162

Note. Sex = heterosexual men × non-heterosexual women; Population = Brazil × the Czech Republic; B = ordinal regression coefficient, SE = Standard Error, p = significance level, ns = non-significant model.

3.3. Differences between preferences and actual partners' physical characteristics

As shown in Table 5, both Brazilian and Czech men preferred, on average, bigger buttocks and bigger breasts, smaller ptosis, and smaller WHR than their actual partners had.

Among non-heterosexual women there was no significant difference in preferred and actual partners' buttocks size and breast size. However, we encountered a significant difference between preferred and actual partners' breast shape and WHR, suggesting that women preferred, on average, smaller breast ptosis and smaller WHR than their actual partners had.

3.4. Effect of population and sexual orientation on self-reported physical characteristics

The GZLM models were significant for self-reported breast size (Likelihood Ratio $\chi^2 = 18.99$, df = 3, $p < 0.001$), breast shape (Likelihood Ratio $\chi^2 = 32.58$, df = 3, $p < 0.001$) and WHR (Likelihood Ratio $\chi^2 = 35.52$, df = 3, $p < 0.001$), but not for buttock size (Likelihood Ratio $\chi^2 = 2.25$, df = 3, $p = 0.523$).

As shown in Table 6, there was no effect of population on self-reports. The models showed significant effects of sexual orientation on self-reported breast size and shape. Heterosexual women described their breasts as smaller and with smaller ptosis than non-heterosexual women. In WHR, age was the only positive predictor (B = 0.046, EF = 0.008, Wald $\chi^2 = 28.87$, $p < 0.001$).

3.5. Preferred and actual homogamy and imprinting-like effect

As shown in Table 7, the strongest homogamy effect was found in WHR, which was consistent across both studied populations. Similarly, Czech women, and both groups of men preferred WHR as their mothers had. Mother-similar WHR appeared also in actual female partners of

Table 5
Comparisons between preferred physical characteristics in ideal female partners, and referred characteristics in actual female partners.

Mann-Whitney *U*	Brazilian men (N = 91)	Czech men (N = 62)	Brazilian women (N = 30)	Czech women (N = 46)
Buttock size	4.30***	2.00*	0.79	1.60
Breast size	5.96***	3.65***	1.42	1.65
Breast shape	4.56***	2.73**	3.09**	4.07***
WHR	6.99***	5.38***	3.64***	4.37***

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Table 6
Effect of population and sexual orientation on self-reported physical characteristics.

	Sexual orientation				Population			
	B	SE	Wald χ^2	p	B	SE	Wald χ^2	p
Buttock size	ns	ns	ns	ns	ns	ns	ns	ns
Breast size	0.293	0.15	3.87	0.049	0.072	0.12	0.38	0.538
Breast shape	0.436	0.16	7.88	0.005	0.170	0.12	1.96	0.161
WHR	0.008	0.15	0.01	0.955	0.158	0.12	1.83	0.176

Note. Sexual orientation = heterosexual women × non-heterosexual women; Population = Brazil × the Czech Republic; B = ordinal regression coefficient, SE = Standard Error, p = significance level, ns = non-significant model.

Brazilian men ($\rho = 0.288$, N = 79, p = 0.010), and there was a non-significant trend also in Czech men ($\rho = 0.265$, N = 54, p = 0.053). The only significant negative correlation in Brazilian homosexual women was between self-reported breast size and their actual partners ($\rho = -0.392$, N = 29, p = 0.036).

4. Discussion

We investigated preferences for buttock size, breast size and shape, and WHR among non-heterosexual women and heterosexual men in two ethnically and culturally diverse populations, Brazil and the Czech Republic. Both men and women mostly preferred medium to bigger buttock and breast size, and WHR of 0.7, although men preferred more curvaceous body shapes (bigger buttocks and breasts, and smaller WHR) than women. Similarly, Brazilians preferred bigger buttocks and breasts than Czechs, although the same WHR. Finally, the respondents unequivocally chose younger-looking female breasts with small ptosis (defined as sagging process where the breasts fall on the chest, flatten and point downward, Rinker et al., 2010) as the most attractive. Preferences for some of the physical traits (WHR and breast shape) seem to be more stable, while preferences for other traits (breast and buttock size) can vary more between populations, and sexual orientations.

So far, only a few studies focused on preferences of body traits in potential partners among non-heterosexual women. Similarly to Cohen and Tannenbaum (2001) non-heterosexual women in our study mostly preferred WHR of 0.7, but they did not mostly choose the biggest breasts as the most attractive. This difference can be partly caused by different methods. Cohen and Tannenbaum (2001) offered two stimuli of small and large breasts, whereas we offered stimuli composed of 5 images ranging from very small to very large breasts. Also, our study was based on a Brazilian and a Czech population, whereas the sample of the previous study was based on the US population. Interestingly, non-heterosexual women in our study preferred smaller breasts and buttocks and bigger WHR than heterosexual men. Possibly, non-heterosexual women less than men search for indicators of fecundity and fertility in their potential female partners.

According to the theory of homogamy or self-similarity individuals are expected to prefer and couple with people of similar physical traits (Štěrbová & Valentová, 2012). We found that both Czech and Brazilian women had self-similar preferences for WHR in a potential female partner. Moreover, Brazilian women preferred self-similar breast size, and Czech women preferred self-similar buttock size and breast shape. This is in line with a previous study, where non-heterosexual women mostly preferred partners of a self-similar body height (Valentova et al., 2016), thus providing early evidence for preferred homogamy for physical traits among non-heterosexual women across different populations.

Further, we provided some support for an imprinting-like effect on partner preferences in heterosexual men and non-heterosexual women. Both Czech men and women and Brazilian men preferred WHR similar to WHR of their mothers as they remembered it from childhood. Moreover, Czech men also preferred mother-similar breast size in their potential female partners. Alternatively, the similarity between mothers and potential partners can result as a by-product of preference for age-similar partners, assuming that today the participants are of approximately the same age as their parents were during their childhood. Similarity in age between partners has been reported by numerous studies (e.g., Esteve, Cortina, & Cabré, 2009). However, a tendency to prefer older partners was also found in individuals who grew up with relatively older parents (Perrett et al., 2002). Our results on parent-similarity are in line with previous findings that individuals who were exposed to a pregnant or lactating mother during childhood (especially between 1.5 and 5 years of age) reported more frequently sexual preferences for pregnancy or lactation (Enquist, Aronsson, Ghirlanda, Jansson, 2001). Because individuals share many hereditary characteristics with their parents, preferences for self-similarity can also be by-product of a preference for parent-similarity (Štěrbová & Valentová, 2012). Nevertheless, investigating self-similarity and parent-similarity effects on preferences for sex-dimorphic traits, such as female breast size, is possible in particularly among individuals who share the same characteristic with both the parent and the partner, i.e., homosexual individuals. Homosexuals, or non-heterosexuals in general, are thus a unique group to disentangle the relative roles of self-similarity and parent-similarity in mate preferences and mate choice.

Concerning their actual partners, Brazilian men also described their actual female partners as having WHR similar to their mothers, and there was a similar non-significant trend also in Czech men. There was no such trend in actual partners of non-heterosexual women, and similarly, women did not choose self-similar partners, although they preferred them. This can be possibly given by a smaller 'mating market' among a sexual minority, and thus more limited opportunities to find a partner with preferred characteristics (Mc Farland, 1975). In general,

Table 7
Spearman correlations between physical traits in female respondents and their ideal partners (preferred homogamy), and correlations between respondents' mothers and respondents' ideal partners (imprinting-like effect).

	Men				Women			
	Brazilian		Czech		Brazilian		Czech	
	N	ρ	N	ρ	N	ρ	N	ρ
Self-similar buttock size	–	–	–	–	76	0.204	107	0.300**
Self-similar breast size	–	–	–	–	76	0.264*	107	0.160
Self-similar breast shape	–	–	–	–	76	0.217	107	0.194*
Self-similar WHR	–	–	–	–	76	0.352**	108	0.517***
Mother-similar buttock size	159	0.030	111	0.056	72	0.223	101	0.243*
Mother-similar breast size	159	−0.026	111	0.228*	72	−0.008	101	0.076
Mother-similar WHR	160	0.182*	111	0.193*	72	0.024	102	0.248*

N = number of participants, ρ = Spearman correlation coefficient.
* p < 0.050.
** p < 0.01.
*** p < 0.001.

we found that both men and women preferred lower WHR and younger looking breasts than their actual partners had, supporting previous findings suggesting that preferences and actual choices can differ substantially (e.g., Todd, Penke, Fasolo, & Lenton, 2007).

We further found some differences in partner preferences between the two studied populations. In particular, Brazilian participants preferred bigger buttocks and breasts than Czech participants, although there was no difference in preferences for WHR or breast ptosis. To test whether differences between populations were associated with the frequency of the given trait in the population, we investigated self-reported physical characteristics among heterosexual and non-heterosexual women from both populations. However, we found no differences in self-reported physical characteristics between Brazilian and Czech women. Thus, the differences are probably influenced by other factors, such as ecological and/or cultural and historical. To test for a specific factor, we would need to control for other variables, include more populations in the analyses, or employ a longitudinal study design. Interestingly, as shown by the international plastic surgery statistics, Brazil is one of the world leading countries in aesthetic surgeries, with breast and buttock augmentation and liposuction being the most frequently performed treatments among women (http://www.isaps.org). We can speculate that strong preferences for specific parameters of body traits can increase the tendencies for body modifications of the population. Conversely, the higher proportion of women that undergoes plastic surgeries in the population can increase preference for the specific body traits.

Collecting data online might have been one of the limitations of our study, and our results should therefore not be generalized to the entire population of either country. Further, we used limited computer generated stimuli to assess preferences and actual choices, while natural stimuli might provide more realistic settings. Moreover, we did not obtain reports by our respondents' partners nor mothers about their own body characteristics, thus, we rather studied reflection of our participants about their actual partners' and mothers' physical traits. In case of mother, because of possible imprecise memories, it is even more complicated. Finally, it should be noted that the effect sizes reported in this study are small, and thus any encountered inter-group differences should be taken with caution.

To sum up, we found that personal experience (mother's characteristics), own characteristics (own physical traits, sexual orientation) and external factors (population) can calibrate individual differences in preferences for specific physical traits and to a lesser degree also actual mate choice. Our results emphasize the importance of combining cross-cultural comparisons with focus on participants of different sexual orientations to disentangle how these factors underlie preferences for various physical traits that were shown to play an important role in mate choice.

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