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The height of choosiness: mutual mate choice for stature results in suboptimal pair formation for both sexes

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Mutual mate choice is prevalent in humans, where both males and females have a say in their choice of partner. How the choices made by one sex constrain the choice of the other remains poorly understood, however, because human studies have mostly limited themselves to measuring preferences. We used a sample of 5782 speed-daters making 128 104 choices to link preferences for partner height to actual choice and the formation of a match (the mutual expression of interest to meet again). We show that sexual conflict at the level of preferences is translated into choice: women were most likely to choose a speed-dater 25 cm taller than themselves, whereas men were most likely to choose women only 7 cm shorter than themselves. As a consequence, matches were most likely at an intermediate height difference (19 cm) that differed significantly from the preferred height difference of both sexes. Thus, our study reveals how mutual mate choice can result in suboptimal pair formation for both sexes, highlighting the importance of assessing the mate choice process in its entirety.

Finding a suitable mate to form a reproductive unit is complex, owing to the many factors that prevent an individual from obtaining his or her preferred partner. First, mates with the desired properties might not be available and, even if they are, individuals might have insufficient time to assess all available possible mates (Reynolds & Gross 1990; Widemo & Sæther 1999; Fawcett & Johstone 2003; Cotton et al. 2006). Second, some desired characteristics might trade off against each other; for instance, attractiveness might trade off against willingness or ability to provide parental investment (Magrath & Komdeur 2003); obtaining a mate with the desired level of both characteristics might, as a consequence, be impossible.

Relatedly, other individuals' pursuit of their own interests can impair mating with preferred individuals. In many species, including humans, mating is a two-sided affair: individuals who prefer a given partner must themselves be chosen as a mate by that individual (Johnstone et al. 1996; Baldauf et al. 2009). In addition, third parties, especially same-sex rivals, can interfere with obtaining one's desired mates (Wong & Candolin 2005). Furthermore, even successful pair formation (i.e. pair bonding) always entails the risk that, at some point in the future, the partner may move to a more attractive alternative (Rusbult & Buunk 1993). For these and other reasons, any given individual's mate preferences are unlikely to be completely satisfied.

In part because of the difficulty of tracking choice and pairing, the study of mate choice has focused to a large extent on measuring preferences (Courtiol et al. 2010b). How preferences translate to actual choices and subsequent pairing remains unclear. One window onto the relationships between preferences, choice and pairing is so-called speed-dating events. During a speed-dating event, participants meet approximately 10–30 individuals in a series of 3–7 min 'dates' after which they discretely indicate whether they are interested in further contact ('Yes'/'No'). When a 'Yes' is reciprocated, they make a 'Match', and contact details are subsequently provided to enable participants to arrange a more traditional date if desired (Kurzban & Weeden 2005, 2007; Finkel & Eastwick 2008; Lenton & Francesconi 2011). Although such 'matches' do not inevitably lead to the formation of an actual relationship, people who were matched with at least one person during speed dating had a

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10.9% chance of engaging in sexual intercourse with a 'match' within 6 weeks of the event, while the chance of a more serious relationship after 1 year was 7.2% (Asendorpf et al. 2011). Thus, speed dating is an ecologically relevant setting to study pair formation.

Data from speed-dating events have some advantages over self-report questionnaire- or vignette-based studies, having greater ecological validity and allowing a look at the effects of mutual mate choice. More importantly for the present purpose, speed dating allows researchers to determine how mate preferences, self-reported indications of what individuals want in a mate, translate into the choices that individuals actually make, and how these choices translate into subsequent potential pairing. We thus treated the speed-dating venue as a 'model system' that enabled us to interrogate human mate choice processes in a manner directly comparable to those of other species (Lenton et al. 2009). To this end, we operationalized definitions related to preference, choice and pairing as used in the mate choice literature (Fowler-Finn & Rodríguez 2012a, b) for use within a speed-dating context, focusing on partner height as a preference variable (see Table 1).

Previous studies that have addressed the interplay between preferences, choice and pairing in speed dating have shown that stated preferences are generally poor predictors of choice, in that many 'nonpreferred' individuals are also chosen (Kurzban & Weeden 2007; Todd et al. 2007; Eastwick & Finkel 2008; Eastwick et al. 2011). Preferences also fail to predict which potential mates are pursued after a speed-dating event (Eastwick & Finkel 2008). Furthermore, choices made during speed-dating events were only weakly reciprocated between partners (Luo & Zhang 2009; Back et al. 2011).

The present analysis has several advantages over previous work. First, we examined preferences, choice and pairing simultaneously. Second, we focused on one trait, height, which is a particularly useful trait to study because: (1) it is an easily verified objective measure (in contrast to, e.g. kindness or reported income); (2) both sexes show height preferences (Courtiol et al. 2010a; Stulp et al. 2013b); (3) partner heights correlate positively (Spuhler 1982; Stulp et al. 2011) and men are taller than their partner more often than expected by chance alone (Gillis & Avis 1980; Stulp et al. 2013a), indicating that pairing with respect to height is nonrandom; and (4) both male and female heights are related to the number of children produced (Stulp et al. 2012a, b, c), indicating that pair formation with respect to height can affect reproductive success and thereby has evolutionary relevance. Another advantage of our study is that a clearly defined partner preference was available (i.e. preferred partner height), allowing a direct comparison with the response to heights. This compares favourably to previous studies, where preferences have most commonly been measured using a subjective scale (e.g. rate on a scale how important physical attractiveness is in an ideal romantic partner; see Kurzban & Weeden 2005 for a notable exception). Finally, because we could combine the specific preferences and choices of both sexes simultaneously, we were able to assess potential conflicts over partner height, and so examine how mutual mate choice affects final pairing.

Previous work indicates that preference functions for height in both sexes do not align, creating a sexual conflict over partner height (Baldauf et al. 2009; Courtiol et al. 2010a; see Table 1). The present work first reproduced this finding, and, subsequently, we tested (1) whether stated preferences for partner height translated into actual choice during speed dating and (2) whether height was related to responsiveness (while others might use terms such as 'selectivity' or 'choosiness,' we use this term to connect with the animal literature) and desirability. Based on the preferences and choices of speed-daters, we determined both the strength of preference and tolerance with respect to height (Table 1), and examined how these depended on a person's sex and own height. Finally, we tested whether (3) the conflict between the sexes over stated height preferences affected choice and pair formation.

METHODS

Speed Dating

We used data collected by HurryDate, a firm organizing speed-date events across North America. The procedure and data have been described elsewhere (Kurzban & Weeden 2005, 2007). In short, men and women are invited in groups of usually up to 50 and with an approximately equal sex ratio. Events are stratified by age (25–35 and 35–45 are typical). During an event, all men interact with all women for 3 min per date after which both parties discretely register their interest in the other person by indicating either 'Yes' or 'No' on a designated scorecard. These are then stored by HurryDate and checked for 'matches': cases in which both male and female indicated 'Yes' to one another. Subsequently, participants are informed who their matches are, can view these individuals' online profiles, and send emails to their matches. Our sample consisted of single men and women paying a fee to attend the event, indicating that these individuals were genuinely searching for a mate (and contrasts with many other studies in which speed-daters received a reward for participating in the form of, for instance, money or course credits e.g. Eastwick & Finkel 2008; Luo & Zhang 2009; Eastwick et al. 2011). HurryDate collects survey data from their participants including their own height and a preferred height range (i.e. a minimal and maximal preferred height).

During a HurryDate event, women usually remain seated while the men change positions. Given this pattern, women's height may

Table 1
Definitions of preference measures, choice and pairing drawn from the literature and the operational definitions used in a speed-dating context

Variable	General (short) definition	Operational definition
Preference ranking	The ranking of mates based on the trait value with respect to likelihood of mating	The stated minimal and maximal preferred height
Strength*	The degree to which deviations from the ideally preferred trait value are disfavoured	The decrease in the probability of responding 'Yes' to a speed-dater whose height deviates from the chooser's acceptable height range preference
Responsiveness*,†	The probability that an individual will respond positively to any mate, independently of trait value	The probability of responding 'Yes' to any speed-dater encountered during an event, independently of their height
Tolerance*	The range of trait values considered acceptable by a choosing individual	The standard deviation of the mean of those heights to which a 'Yes' response was given
Choice	Positive response to sampled mates	Whether a given speed-dater gave a 'Yes' response
Pair formation	The formation of a pair to reproduce	Whether a 'Yes' response was reciprocated, and a 'Match' formed

* Based on Fowler-Finn & Rodríguez (2012a, b).
† In the speed-dating literature often referred to as 'selectivity' or 'choosiness'.