



# Perceived female intelligence as economic bad in partner choice



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## ABSTRACT

We study gender differences in preferences for mate characteristics such as perceived (by the opposite sex) physical attractiveness and intelligence using data from the Columbia speed dating experiment. We have observed that the probability of a woman's positive speed dating decision rises with perceived male physical attractiveness, as well as their intelligence. The probability of a man's positive decision rises with perceived female physical attractiveness. However, the relationship between the probability of a man's positive speed dating decision and perceived female intelligence is non-monotonic. The optimal level of women's perceived intelligence can be found, and it depends on perceived female physical attractiveness. This optimal value rises with perceived female physical attractiveness. The results obtained suggest that virtually, in the women's view, male physical attractiveness can be effectively substituted for intelligence (equally male intelligence can be effectively substituted for physical attractiveness). By contrast, in men's view, for relatively high values of perceived female intelligence, female physical attractiveness cannot be substituted for intelligence. Research findings suggest that for relatively high values of perceived female intelligence this personal trait turns to be an economic bad.

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## 1. Introduction

Doing research on initial romantic attraction is a tricky task, because as in all matching markets (see e.g. Browning, Chiappori, & Weiss, 2014), determining individual preferences from market outcomes is burdened with the risk of coincidence (e.g. the fact that biologists choose biologists as romantic partners can be explained by preference structures as well as the fact that biologists study or work with other biologists).

We overcome this coincidence problem by studying the experimental data from the Columbian speed dating experiment (see e.g. Fisman, Iyengar, Kamenica, & Simonson, 2008). As the dataset consists only of heterosexual dates, all our conclusions are confined to heterosexual relationships. Speed dating protocols allow for tight experimental control and, even more importantly, reflect individual decision making in real world settings, dramatically increasing ecological validity (Finkel, Eastwick, & Matthews, 2007; Eastwick & Finkel, 2008). Speed dating is usually meant to find a long-term partner, although some participants (in particular men) may have different intentions (Asendorpf, Penke, & Back, 2011). While long-term mating is usually the preferred tactic for single women, this is less true for men, who in general have a stronger interest in and comfort with casual sexual contact in the absence of emotional closeness (Li & Kenrick, 2006).

Speed dating protocols are used, among others, for looking into determinants of romantic target selection (see e.g. Fisman, Iyengar, Kamenica, & Simonson, 2006; Todd, Penke, Fasolo, & Lenton, 2007; Tidwell, Eastwick, & Finkel, 2013). In this study we concentrate on two important determinants of romantic target selection, i.e. the perceived (by the opposite sex) physical attractiveness and intelligence of the potential partner. Several studies suggest that the physical attractiveness and intelligence of the other person may be evaluated in a relatively short time (see e.g. Borkenau & Liebler, 1993; Zebrowitz, Hall, Murphy, & Rhodes, 2002; Fisman et al., 2006; Sim, Saperia, Brown, & Bernieri, 2015). Researchers of human mating have observed significant differences between female and male preferences for mate characteristics such as physical attractiveness and intelligence (Hoyt & Hudson, 1981; Buss & Barnes, 1986; Buss, 1989; Kenrick, Groth, Trost, & Sadalla, 1993; Fisman et al., 2006).

The phenomenon of human mating has been studied from both psychological (including the evolutionary psychology perspective, see e.g. Miller & Todd, 1998) and economic viewpoints. Psychologists have long studied the determinants of mate selection using survey and field experiment evidence (for extensive reviews, see Buss & Kenrick, 1998; Regan, Levin, Sprecher, Christopher, & Cate, 2000). The psychological research (Buss, 1989) reveals gender differences in mating preferences. Women tend to value qualities that lead to economic resources, such as ambition, industriousness and high social status. Men, in turn, tend to value physical attractiveness and a youthful appearance. It is however worth mentioning that sex differences in mating preferences appear

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when it comes to prioritizing these attributes on a limited mating “budget”; that is, when not asked to prioritize which traits are “most important”, men and women tend to value the same attributes in a romantic partner (Li, Bailey, Kenrick, & Linsenmeier, 2002).

The gender differences in mate selection are most pronounced in choices for long-term relationships. In the context of short-term mating the aforementioned differences dim. On the one hand, women lay greater emphasis on the physical attractiveness of a potential partner in the context of short-term than long-term mating (Regan, 1998). On the other hand, men lower their standards regarding physical attractiveness significantly in the context of short-term mating (Buss & Schmitt, 1993).

Psychological theories are extremely helpful in explaining gender differences in mate choices for long-term relationships. The (biologically inspired) evolutionary theory of parental investment (Trivers, 1972) states that the sex that invests more in offspring would be more selective about mates. The greater required minimum parental investment by females (time and energetic resources spent during gestation and subsequent lactation in comparison with a single act of copulation as the minimum required parental investment for human males) makes them more choosy than males. Therefore women engage in careful mate selection in order to find men who can provide valuable economic resources to aid in the upbringing of children. Thus women focus on men with high resource acquisition ability which usually goes with high social status (Kenrick & Keefe, 1992).

Some social psychologists explain gender differences in mate selection by the fact that women and men play different roles in society (Eagly, 1987). Social roles (according to social structure theory) determine development of built-in tendencies of women and men to attempt to accommodate assignment to their social roles (Eagly & Wood, 1999). Sex differences in partner choice criteria derive from the differences in the social roles of women and men (selection criteria reflect a preference for individuals who fit their stereotypical gender role, see Fisman et al., 2006). Thus women may avoid men who are superior to them on stereotypical female dimensions (e.g. physical attractiveness) and men may avoid women who are superior to them on stereotypical male dimensions (e.g. ambition).

The phenomenon of human mating has been also thoroughly studied by experimental economists and game theorists. Economic experiments on human mating have been based on speed dating protocols (see Fisman et al., 2006, 2008; Belot & Francesconi, 2013). The speed dating protocol is an experimental device to study two-sided market matching. In economics, a market is two-sided if there are two sets of subjects, and if a subject from one side of the market can be matched only with a subject from the other side (Roth & Sotomayor, 1990). In the context of human mating, a two-sided matching analysis (Shapley & Shubik, 1972; Roth & Sotomayor, 1990; Miller, 1997) assumes a certain population of both sexes, where each subject has a defined set of preferences across individuals of the opposite sex. Gale and Shapley (1962) proposed that a two-sided matching is stable only if it left no pair of subjects who were not matched to each other but would both prefer to be (a detailed overview of two-sided matching can be found in Roth and Sotomayor (1990)).

Some economists perceive mating as a process involving searching, meeting and selecting partners (Choo & Siow, 2006; Gautier, Svarer, & Teulings, 2010; Belot & Francesconi, 2013). In this literature the focus is on the conditions under which positive marital sorting can arise. Positive sorting arises as a result of individual preferences. According to Belot and Francesconi (2013) positive sorting can be consistent with aligned preferences (whereby people value the same attributes) as well as assortative preferences (whereby people prefer mates who are similar to themselves). However, disentangling these two channels is challenging. A main problem is that economists only observe final matches, but seldom observe the whole pool of potential partners, nor do they have sufficient information on the process of proposals and rejections that prelude the formation of a relationship (Belot & Francesconi, 2013). As a result, economists are typically unable to

unravel the separate influence of the forces which underlie the relationship formation (for elaboration, please see Belot & Francesconi, 2013).

The objective of this paper is to assess the influence of perceived physical attractiveness and intelligence of a potential partner on human mating decisions. We place special emphasis on the relationship between the probability of being chosen in the speed dating experiment and the perceived personal traits of the participants, such as physical attractiveness and intelligence. Several studies demonstrate the importance of the aforementioned attributes in mate choice decisions and the evaluations of potential mates (see e.g. Vandenberg, 1972; Buss, 1985, 1989; Kanazawa & Kovar, 2004; Fisman et al., 2006; Lee, Loewenstein, Ariely, Hong, & Young, 2008; Kanazawa, 2011; Lee, Dubbs, Von Hippel, Brooks, & Zietsch, 2014).

In order to solve the above research problem we have built the appropriate logit model on the basis of Columbia speed dating experimental data. All statistical computing was done in R software.

## 2. Materials and methods

In our research we used the experimental data<sup>1</sup> collected by Andrew Gelman (Department of Statistics, Columbia University, New York). 278 males and 276 females participated in a series of experimental speed dating sessions run at the Columbia University in the City of New York. All participants were students representing different faculties of the Columbia University (participants have been assigned to one of the eighteen fields of study, i.e. (1) Law, (2) Mathematics, (3) Social Science and Psychology, (4) Medical Science, Pharmaceuticals and Biotechnology, (5) Engineering, (6) English, Creative Writing and Journalism, (7) History, Religion and Philosophy, (8) Business, Economics and Finance, (9) Education, (10) Biological Sciences, Chemistry and Physics, (11) Social Work, (12) Undergraduate Students with no Specialization, (13) Political Science and International Affairs, (14) Film, (15) Fine Arts and Arts, (16) Languages, (17) Architecture and (18) Other).

In the speed dating experiment participants attended events where they went on a series of brief dates with other attendees. These dates lasted 4 min within each event. After the date, participants had the opportunity to evaluate (on a 10-point grading scale, from 1 to 10) the physical attractiveness and intelligence of the other dater. After the event, participants had the opportunity to say “yes” or “no” to each of the other daters. If two speed daters said “yes” to one another, they were given the ability to contact each other for a future date.

4184 speed dates were organized within the experiment’s running time. In total, 8368 individual decisions were made. Table 1 depicts the number of “yes” and “no” decisions according to participant gender.

Unfortunately, when filling the values of physical attractiveness and intelligence of their conversation partners, some participants paid less attention and missing data occur. For observations with one missing value, 62% of the decisions were negative. If both physical attractiveness and intelligence were left blank, the percentage of refusals was even higher and reached 97%. As a result, for modelling purposes, 8072 observations with full information were used. Fig. 1 shows how participants’ physical attractiveness and intelligence were rated by their conversation partners. Table 2 summarizes the data.

To model the relationship between decision making and the perceived personal traits (perceived physical attractiveness and intelligence) of the daters we use logistic regression. Due to the use of the logit function posterior probabilities are always in the domain of 0 to 1. The probability that a given observation will be classified as a certain class  $Y$  ( $Y = 1$  refers to a positive (“yes”) decision;  $Y = 0$  refers to a negative (“no”) decision), given vector  $x = (\text{attractiveness, intelligence,}$

<sup>1</sup> The data are available online: <http://www.stat.columbia.edu/~gelman/arm/examples/speed.dating/>.

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