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Skopek, Jan; Schmitz, Andreas; Blossfeld, Hans-Peter

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Jan Skopek, Andreas Schmitz & Hans-Peter Blossfeld

The gendered dynamics of age preferences – Empirical evidence from online dating

Die geschlechtsspezifische Dynamik von Alterpräferenzen – Empirische Evidenzen aus dem Online-Dating

Abstract:

This study uses innovative data from online dating to analyze men's and women's preferences regarding the age of a partner. These data include observations on how individuals behaved on online dating platforms as well as information on which preferences individuals stated in a survey from an online panel. The paper analyzes how male and female age preferences can be explained by an individual's own age, preferences for other traits, and own market-relevant traits that are favorable or unfavorable for others. Our results show that age preferences essentially shift with age, but in different ways for men and women: Whereas men increasingly prefer younger women as they age, women's age preferences become increasingly diverse. They also show that age preferences are confounded with gender-specific preferences for attractiveness and education. Finally, preferences for age also vary with market-relevant traits such as education and parenthood, but not with prior marital experience. Altogether, our analyses point to a gender-specific decline in mate value with differential consequences for men's and women's mating preferences.

Zusammenfassung:

In der vorliegenden Studie werden innovative Daten, die aus dem Online-Dating stammen, verwendet, um die Präferenzen von Männern und Frauen hinsichtlich des Alters eines Partners zu untersuchen. Diese Daten umfassen sowohl Beobachtungen, wie sich Individuen auf den Plattformen einer Partnerschaftsbörse verhalten, als auch Informationen über die Präferenzen, die Individuen bei einer Online-Umfrage nannten. In diesem Beitrag wird analysiert, wie die Alterspräferenzen von Männern und Frauen durch das jeweilige Alter des Individuums, die Präferenzen hinsichtlich anderer Eigenschaften sowie die je eigenen marktrelevanten Eigenschaften, die anderen als wünschenswert oder nicht gewünscht erscheinen, erklären werden können. Wie unsere Ergebnisse zeigen, ändern sich Alterspräferenzen wesentlich mit dem eigenen Alter, dies jedoch für Männer und Frauen in unterschiedlicher Weise: Während Männer zunehmend jüngere Frauen bevorzugen, wenn sie selbst älter werden, entwickeln sich die Alterspräferenzen hinsichtlich der Partner in zunehmend unterschiedlicher Weise. Zudem zeigen die Ergebnisse, dass die Alterspräferenzen mit geschlechtsspezifischen Präferenzen hinsichtlich der Attraktivität und des Bildungsstandes konfundieren. Schließlich variieren die Alterspräferenzen auch mit marktrelevanten Eigenschaften wie Bildungsstand und Elternschaft, nicht jedoch mit vorherigen Eheerfahrungen. Alles in allem weisen unsere Analysen auf einen geschlechtsspezifischen Rückgang des Wertes auf dem Partnermarkt mit für Männer und Frauen un-

terschiedlichen Konsequenzen für die Partnerpräferenzen hin.

Key words: age preferences, mate selection, revealed preferences, stated preferences, partner market, online dating

Schlagwörter: Alterspräferenzen, Partnerwahl, offenbarte Präferenzen, selbst berichtete Präferenzen, Partnermarkt, Online Dating.

1. Introduction

Even though there can be no doubt that age is a central variable in assortative mating (Hollingshead 1950; Klein 1996a), sociological research on the role of age in mate selection is rare. The lack of studies is striking, because not only an actor's characteristics but also the relational position on the "partner market" change continuously with age. In addition, a higher rate of union dissolution as well as an increasing prevalence of repartnering and remarriage (Engstler/Menning 2003; Lankuttis/Blossfeld 2003) are leading to a significant growth in the number of people who want to form another partnership or marriage, thus eventually making mate selection more relevant over an increasingly broad age interval.

Most sociological work on the role of age in partner search can be found in the field of homogamy research (Atkinson/Glass 1985; van de Putte/Matthijs 2001; van de Putte et al. 2009; van Poppel/Liefbroer/Vermunt/Smeenk 2001; Vera/Berado/Vandiver 1990). Scholars studying age in assortative mating often rely on presumed similarity preferences for age, take patterns of age homogamy as evidence for such preferences, or even interpret age homogamy as an indicator of gender egalitarianism (cf. van de Putte et al. 2009) or romantic involvement (cf. Shorter 1977). However, if similarity in age is a preferable state for a couple, why do age differences between mates vary significantly at marriage (Bytheway 1981)? Why do men increasingly marry younger women as they get older – a largely neglected regularity in the literature, as pointed out recently by England and McClintock (2009)? To gain deeper insights into the role of age in mate choice, it is necessary to examine the partner preferences of both men and women, because the implicit assumption that age-related marital patterns are an expression of age preferences might be seriously flawed (South 1991). In our paper, we shall argue that age preferences of men and women (a) not only shift strongly as they age, but, moreover, are related to (b) an individual's overall image of an ideal partner as well as (c) an individual's relative position in the mate market.

Utilizing Web-generated process data from a major German dating site, we shall first disclose age preferences by reconstructing contact choices of men and women in an early encounter context. Furthermore, we shall examine how men and women reciprocally generate age-segmented opportunity structures for the opposite sex through their contact behavior. In a second step, we shall use additional information on the partner preferences of site users taken from an online panel to analyze what meaning is subjectively ascribed to age in the context of a partner market, drawing on individuals' perceptions of themselves and others. In particular, we shall analyze how far certain age preferences in men and women are "confounded" by preferences for other mate traits such as physical attractiveness and educational attainment level.

Finally, we shall assess whether the age preferences of men and women vary according to the individual traits favored or disfavored by others. Such variations could be expected if actors prove to adjust their preferences to their relational position in the market, that is, their own mate value.

Our paper is structured as follows: First, we shall discuss theoretical approaches to age preferences in men and women and derive hypotheses for our empirical analysis. Second, we shall describe the data and our methodological approach. In the subsequent empirical section, we shall present the results of our analysis of revealed age preferences and stated age preferences. Finally, we shall draw conclusions and sketch further research perspectives.

2. Definitions of preferences

The literature on mate choice often uses the concept of preferences in different ways, and most empirical studies lack any explicit definition. For our analysis, we distinguish between different concepts of preferences. With regard to some object of choice, a preference means that an actor favors an Alternative A over an Alternative B. Specific traits (such as age, education), specific values of traits (such as a certain age), or even a specific person might represent an actor's object of potential choice. The subject of this choice, the actor, can have *absolute* preferences and *relational* preferences toward these objects. The former refer to a preference for an alternative independent from individual characteristics of the actor, whereas the latter refer to a preference of objects in relation to the actor's characteristics.

Relational preferences can be separated into preferences for a *similar* or a *dissimilar* partner. For instance, a woman may favor a man with a similar educational level but may disfavor a man of the same age (preferring an older man instead). If we observe patterns of interaction between men and women, we speak of "homophily" when partners have similar characteristics and "heterophily" when partners are dissimilar.

Preferences for different partner traits might be interrelated. For example, the preference for a certain age might coincide with preferences for educational level. We label this "confounded preferences."

The measurement of preferences comprises two methodological approaches: First, a preference can be measured via self-report data surveyed by questionnaire items assessing the characteristics of an ideal mate. This is called the stated preferences approach (cf., e.g., Ben-Akiva et al. 1994), and is often used in the social sciences. A stated preference is a subjectively expressed tendency to choose in a certain way in a hypothetical choice situation. Second, in contrast, one can also observe actual choices of individuals and thereby virtually "reveal" their preferences. This has been labeled the preference approach (cf. *ibid.*), and is usually applied by behavioral economists.

3. Theories and hypotheses on age preferences

In the following, we shall discuss age-related mate preferences against the background of (a) social norms and (b) social exchange. Subsequently, we shall extend the exchange theory perspective on mate selection to (c) a market perspective on partner preferences.

The impact of social norms

Age patterns of marriage partners have been explained in terms of societal norms regarding an acceptable age relation within a couple (e.g., Lewis/Spanier 1979; Spanier/Glick 1980). The core assumption is that men and women internalize socially shared conceptions about a “normal” partnership during the course of their socialization. Age norms for partnerships are stabilized by social sanctions penalizing those who violate the norm. As a consequence, individuals learn to desire the “normal” and reproduce this conception through their own mating decisions. From this perspective, preferences regarding a partner’s age are essentially expressions of internalized conventions of what is perceived as acceptable in a society. Because the majority of marriages (at least in western societies) can be characterized by a husband being an average of 3 years older than his wife (Cox 1970; Klein 1996a, 1996b; Presser 1975), a *de facto* norm of the “older man” is inevitably present. Hence, age norms suggest that the man should be slightly older than the woman, but not too much older (Vera et al. 1990).

With regard to inter- and intragenerational variation, age differences are explained by shifts in the norm structure due to social change or to different levels of commitment to marital norms in different social classes. For example, lower age discrepancies in the upper social classes are sometimes supposed to be a result of their lower commitment to traditional norms (e.g., Cuber 1971; Vera/Berardo/Berardo 1985, 1987). Similarly, larger age differences for older individuals at the time of marriage is discussed as an effect of less binding normative commitments for older persons (e.g., Bytheway 1981).

The social norms perspective on the age of partners allows us to derive some basic hypotheses on the age preferences of men and women. If there is a “man-older” norm in society, we should find a clear tendency for “man-older” preferences being shared by men and women. However, because a man should be only slightly older (about 3 years), he should not prefer much younger women, and women should not prefer much older men. Instead, one could expect that norms prescribe preferences for “directed” similarity (similar age, but man slightly older). However, the question remains: How do age preferences change with age? A social norms perspective offers two contradictory ideas: One is to expect that age preferences will not change significantly over age for men and women. Alternatively, as Bytheway (1981) argues, age-related partnership norms might lose their relevance for choices by older persons. If this is the case, we expect to observe more idiosyncrasies in the age preferences of older individuals and, what is crucial here, an increasing alignment of age preferences in men and women among older age groups.

Social exchange

Arguments referring to norms paint a picture of individuals who fulfill the expectations of their normative context in a rather passive or even mechanical way. The subjective utility maximization approach, in contrast, also referred to as the rational choice approach (Elsater 1986), allows us to conceive marital and nonmarital unions as a specific form of social exchange (Blau 1964; Edwards 1969). In this vein, men and women try to maximize their utility by balancing out the “giving and taking” of the rewards usually connected to an individual’s resources such as age, education, or physical attractiveness. From this perspective, the decision to mate with somebody is conceptualized as a decision to enter a specific kind of exchange relationship. Usually, literature drawing on the exchange concept assumes that men try to exchange their socioeconomic resources (such as education or income) against the physical beauty of women and vice versa (Elder 1969; Taylor/Glenn 1976). Nonetheless, clear empirical evidence for this pattern is waning in more recent studies (Stevens/Owens/Schaefer 1990).

With regard to male and female preferences for a partner’s age, social exchange theory gives different predictions depending on the exact meaning of age within anticipated exchange relations. First, the age of partners or rather the age discrepancy between them might be considered as a characteristic of couples in which general similarity is important for reasons of everyday cultural life. Similarity in age can facilitate a common lifestyle or might reduce conflicts in daily interaction routines, because partners of the same birth cohort also share comparable life experiences, tastes, and values. In the same vein, family economics considers age to be a complementary trait. As a result, similarity matching along age should be optimal in marriage markets (Becker 1973). Drawing on these arguments, scholars studying homogamy in marriages often presume similarity preferences with regard to age when explaining marriage choices (e.g., Kalmijn/Flap 2001). Sometimes they even interpret rates of age homogamy on the aggregate level as evidence for the prevalence of robust similarity preferences for age at the microlevel (McPherson/Smith-Loving/Cook, 2001). Thus, if similarity in partner’s age serves as a cultural resource determining the quality of everyday life interaction, we can expect both men and women to prefer partners of equal age regardless of their own age. If it is similarity in age that contributes to a union’s quality, we should also expect men’s and women’s similarity preferences for age to be constant over the life span.

However, social exchange theory can also be used to derive other hypotheses that do not necessarily predict preferences for age similarity. This is the case when age is defined as an interpersonal resource relating to an individual’s overall mate value; for example, if a person’s age is related to his or her beauty as perceived by individuals of the opposite sex. Unmistakably, modern western cultures prescribe standards of “beauty” that place a premium on youthful looks (Öberg/Tornstam 1999). It follows that age can be seen as a continuously declining resource of physical attractiveness during later phases of the life course. If a society has a physical attractiveness stereotype (“what is beautiful is good,” cf. Dion/Berscheid/Walster 1972), individuals complying with the standard of beauty will occupy advantageous positions in partner markets. Put briefly, if society valorizes youth, being old can be a problem when searching for a mate.

This problem would seem to be more severe for women if the assumption of “a double standard of aging” holds true (Sontag 1979). This observation implies a strong gender-specific coupling of attractiveness and age. According to this perspective, the perception of physical attractiveness is attached more strongly to youth for women than it is for men. Empirical support for this can be found in rating studies reporting a negative effect on beauty ratings of female stimulus pictures when these lack youthfulness compared to no clear effect of age on men’s physical attractiveness (e.g., Berman/O’Nan/Floyd 1981; Deutsch/Zelenski/Clark 1986; Henss 1991). This leads to the generalization that men are expected to seek women who comply with a female beauty ideal that might be “fixed” at an age of about 20–25 years (England/McClintock 2009). Accordingly, men in their 20s are expected to prefer women of about the same age. However, as these men get older, they will show an increasing preference for younger women, because they have to go “down” further in order to achieve the ideal age of women. More fundamentally, scholars in evolutionary psychology argue that the male preference for younger women is a biologically “hard-wired” relic of human evolution, because pairing with young women maximizes a man’s reproductive success (e.g., Buss 1989). Nonetheless, England and McClintock (2009) have suggested that men’s preferences for a fixed-age ideal might be offset by a preference for age similarity. Thus, men’s preferred age discrepancy with regard to women might be a “weighted average” of two contradictory causal influences (ibid: 800). Consequently, men will increasingly prefer younger women as they grow older, but not as young as they would be if no similarity preference was at work.

Female preferences for older men are sometimes traced back to a genuine uncertainty in mating markets in conjunction with socially segregated gender roles (Oppenheimer 1988). If a family’s socio-economic status depends essentially on male income, a woman’s status and life chances depend strongly on her husband’s career prospects. However, when a man is young and possibly still in education or just at the beginning of his occupational career, uncertainty regarding his “true” ability as a breadwinner will be high. From this point of view, younger men represent considerably less desirable partners for women. Consequently, in a situation of choice, women are supposed to show a tendency to prefer older over younger men. If this line of thought is accurate, women should not differentiate between men who just have reached the peak of their occupational career and those who have been financially secure for a longer period of time. That is, the argument of women seeking economic security cannot provide a differentiated hypothesis on the desired male age: A man can become economically secure in his 20s just as much as in the final years of his life. In contrast, given the traditional gender role scenario in which female income prospects are less relevant, only a low uncertainty is connected to younger women from the man’s perspective because eminent female traits (such as physical attractiveness) tend to be immediately apparent and easy to assess (Oppenheimer 1988: 577). Thus, uncertainty regarding socio-economic prospects of women should not affect men’s preferences for age of partner.

Different relationship goals might activate different preference sets for partner’s age and hence significantly frame the decision-making process. Buunk, Dijkstra, Kenrick, and Warntjes (2001) have suggested that preferences for partner’s age shift according to the level of involvement, namely, short-term versus long-term mating aspirations. Following exchange theory, the stronger the desire for a long-term relationship, the more actors will

aspire to an intensive and multidimensional social exchange with the future partner. On the basis of our previous discussion, we shall propose two working hypotheses: First, we expect men seeking a long-term relationship to have a stronger attachment on the similarity dimension of age, that is, to have a weaker preference for younger partners and a stronger preference for partners similar in age. Second, we expect women with long-term goals to have a stronger attachment to older men and women with short-term goals to have a weaker preference for older men.

The examples of men's preference for physical attractiveness and women's preference for social status illustrate an important issue of mate preference that has often been neglected in the academic discussion: Preferences in different dimensions might be empirically confounded. That is, a certain preference has interdependent relationships with other preferences within the overall set of preferences. This would cast doubt on the utility of assuming analytically distinct preferences. To give an example, if a man's preference for physical attractiveness is correlated with his preference for younger women, then this correlation will reveal something about the "meaning" of age in the context of mate search. Following the concept of confounded preferences, we expect as a working hypothesis that male preferences for women's age are (partially) a function of male preferences for female attractiveness, whereas female preferences for men's age are (partially) a function of female preferences for male socio-economic status.

A partner market approach

A partner market approach is the natural extension of the social exchange perspective. It draws attention to the fact that individuals, as well as their characteristics, are subject to competition. As a result, the value of certain resources on the partner market is determined by their availability (Stauder 2008). Hence, the chance of preference realization depends on the individual's position in the partner market, and this, in turn, is determined by the individual's resources. The terms "partner value" or "partnership market value" are sometimes used in this context (cf. Todd/Miller 1999). Against the background of this market position, actors reflect on the probabilities of realizing their preferences. A higher partner value corresponds to a better negotiating position, that is, more chances of asserting one's own interests compared to those of others. The less an actor's traits are desirable and the lower the perceived availability of desirable mates, the more he or she will be forced to give up preferences with a low probability of realization. It follows that in a partner market, preference sets of actors should be interrelated with their resource sets.

Consequently, certain age preferences might be the outcome of an adaptive cognitive process reflecting one's chances on the mating market. These chances depend highly on an actor's overall resource set, whose worth is evaluated in the partner market. Maintaining idealistic mating aspirations without any chance of their realization makes little sense, because such behavior can cause cognitive dissonance, psychic stress, or frustration, and it will probably lead to long-term singlehood. Therefore, it is reasonable for individuals to take into account their ability to live up to their actual desire for the opposite sex, and to adjust their personal preference to their personal constraints (Penke/Todd/Lenton/Fasolo 2008). Thus, we would expect men and women to change age preferences as a function of

their own market-relevant traits (their “benefits”), that is, the traits promising to be rewarding and therefore desired by the opposite sex. If traditional gender roles can still be found empirically in a society, we expect that men will try to trade status-relevant characteristics such as educational level for the youthfulness of women. Consequently, higher educational attainment levels should be associated with men’s stronger preference for younger partners. However, if the relevance of traditional gender roles is diminishing through, for example, women’s increasing educational opportunities, rising labor force participation, and better job chances in modern societies, this effect should be observed independently from gender.

Finally, unfavorable traits will restrict actors because they represent interactional “costs” that could force them to adjust their partner preference. In social exchange theory, “costs” represent any perceived costs or a lack of rewards from the perspective of others who will enter into a social exchange relation with the actor (Brehm/Miller 2002). Thus, the more unfavorable actors’ resource sets, the more they will be forced to adjust their aspiration level. Accordingly, we expect that unfavorable traits drive actors to shift their preferences toward partners deviating from an ideal age. In particular, having children from previous relationships and being divorced might belong to those unfavorable traits. The presence of children could be perceived as a source of stress and costs for any new relationship, since caring for those children imposes time investments and effort for activities not directly related to this relationship. In addition, because mate choice implies inherent uncertainty regarding the true characteristics of prospects (Todd/Miller 1999), being divorced might serve as a signaling device to hidden partner traits promising to have detrimental effects on a potential relationship. Hence, the own experience of a previous marriage might alter the actor’s preference structure for partner’s age and there is some empirical evidence supporting that claim (e.g. South 1991). Thus, a cognitive psychological view on exchange processes underlines the relevance of relational preferences in general: It indicates that actors reflect their position in a market and adapt their aspirational level over the course of (un)successful exchange processes.

4. Data and methods

To address the issues discussed, we utilized two datasets collected on a major German online dating website.¹ The first dataset was derived from a database dump of e-mail interactions and user profiles on this site. This Web-generated process data permitted a detailed and nonreactive analysis of choices of contact partners embedded within a mate selection context. Hence, we could observe who was choosing whom for an initial contact and subsequent interaction. This enabled us to assess how men and women change their contact behavior with age, and consequently, how they reciprocally generate the opportunity structures for mating with the opposite sex. That is, how they *react to the situation*

¹ Datasets were collected by the research project “Prozesse der Partnerwahl bei Online-Kontaktbörsen” [Processes of Mate Choice in Online-Dating] funded by the German Research Foundation. We would like to thank the provider of the platform for making the data collection possible.

structured by age and simultaneously *create the opportunity structure* for contacts to the opposite sex.²

The second dataset contains survey data from a sample of online dating users collected via an online questionnaire on the same site.³ It includes questions about the users' absolute and relational preferences regarding several traits in a potential mate. In line with the conventional approach of stated preferences, this approach measured preferences on a subjective level that is latent in the behavioral data (Schmitz/Skopek/Schulz/Klein/Blossfeld 2009). Moreover, by using questionnaire data, we were able to assess the association of certain age preferences with preferences for other traits, as well as with the respondent's traits. Utilizing this subjective information in a second step enabled us to describe the actor's *perceptions and evaluations of their situation* within an age-segmented mating market.

In summary, we adopted a research design involving both an observation and a survey paradigm. This integrated approach delivered information on both revealed preferences and stated preferences allowing an integrated perspective on adapted mating behavior as well as on idealized mating conceptions (Schmitz et al. 2009). Of course, there were also limitations to our data. We did not analyze a statistically representative sample of the adult German population. Rather, our sample can be considered as a population of men and women searching for mates online in which we could analyze preferences in a real mate choice context.⁴ In the following, we shall discuss our data, the methods applied, and the results obtained separately for each dataset.

Web-generated process data on choices (Dataset 1)

The process-generated data covered user activities over a randomly chosen time period of about half a year between January and June 2007.⁵ Registered users created their own user profiles (an online equivalent of a personal ad), looked for other people by filtering the database using search forms, and interacted with these through an internal messaging system on the website.

Profiles contained both standardized sociodemographic data (such as gender and age) and nonstandardized data such as photographs and textual descriptions. Moreover, the cooperating company also provided time-related data on e-mail exchanges between users. From this data, we filtered out initial contact e-mails together with their sender and target. Subsequently, we merged sociodemographics (gender and age at time of mailing event) to sender and target nodes and removed self-directed and same-sex contacts. Out of 116,138

2 In our study, we were limited to analyzing preferences and choices of individuals of different ages. Therefore, a variation of preferences over age might have been due not only to an age effect but also to a cohort effect. We believe the latter to be unlikely, because the average age difference of 3 years in couples seems to be a historical constant (cf. Klein 1996a). Nonetheless, we cannot test this claim directly, and this has to be borne in mind when interpreting our data.

3 Questionnaires were part of an online panel study launched on this site by researchers at the University of Bamberg.

4 At the time of data collection, the dating website targeted a broad audience of men and women looking for romantic partners. It was not targeted on any regional, social, religious, or preferential niche.

5 The platform provider gave us access to the data in anonymized form.

user dyads, we removed those with missing age information on either side, resulting in 115,909 dyads. We finally ended up with a sample of 10,427 senders of first contacts (65.42% male) who sent an average of 11.12 contacts (12.75 for men vs. 8.02 for women). Men contacted women who were an average of 4.76 years younger, whereas women contacted men who were an average of 2.74 years older.

By using behavioral choice data from online dating, we were, to some extent, able to “disclose” the age preferences underlying users’ contact decisions (cf. Fiore/Taylor/Zhong/Mendelsohn & Cheshire, 2010; Hitsch/Hortaçsu/Ariely 2010; Schmitz et al. 2009; Skopek/Schulz/Blossfeld 2009, 2011).⁶ Nevertheless, it should be noted that individual preferences were not measured directly in this way. Observed behavior was used to draw inferences on the decision makers’ preferences.

We used men’s and women’s choices to calculate the degree of age-related *homophily* and *heterophily* in the selection of potential mates. Note that we used the word *homophily* as a descriptive concept measuring the extent to which interpersonal relationships evolve between individuals sharing similar characteristics. Analogously, we adopted the term *heterophily* for those couples with dissimilar characteristics.⁷ Referring to the literature, we defined age similarity (or age homophily) as a maximum age difference of 2 years in a sender-target dyad.⁸ Accordingly, we treated a difference in age of at least 3 years in either direction as being dissimilar or heterophilic. We used the term *hyperphily* (or *hypo-phily*) to characterize sender-target dyads in which targets were a minimum of 3 years older (or younger).

Fractions of homo-, hypo-, or hyperphilic age relations were averaged over dyads by sender and subsequently averaged by sender’s age. Moreover, to serve as an empirical reference, we calculated expected fractions of relations by age and gender.⁹

Data collected in an online panel survey (Dataset 2)

In order to analyze stated relational age preferences, we used a dataset collected via an online panel between June 2009 and April 2010. All registered and active users¹⁰ of the

6 Within the observation window, interacting via e-mail was free of charge on this site. Nonetheless, users had to make reasonable selections on whom to contact because interacting with several thousands of other users would be practically impossible. Users were expected to restrict their contact efforts most probably to a favored subsample from the whole population of users. Therefore, we interpreted an initial contact as a sign of the user’s willingness to engage with the addressed user.

7 Here, we followed other authors such as Lazarsfeld and Merton (1954) or Verbrugge (1977) who used the homophily concept to study structures of friendship choices in spatial communities.

8 As in studies on age homogamy, we had to make a qualitative decision regarding the range of age discrepancy that could be considered as “similarity in age” (see, for a detailed discussion, Vera et al. 1985). We also experimented with other cutoffs for similarity.

9 Expected values took the gender-specific age distribution of site users into account and denoted the most likely fractions if the site users’ choice of partners were to be completely random in terms of age. Further details can be found in Skopek et al. (2009).

10 Active users were defined as those who had logged on to the site at least once during the 6 months prior to the starting date of our survey. Inactive users did not receive an e-mail invitation. A total of

online dating site were invited to participate via e-mail. A total of 3,535 users took part in the survey, corresponding to a response rate of about 10%.

For our analyses, we restricted the sample in the following ways: We dropped individuals who did not specify their gender or date of birth and were not currently searching for a partner. Because we were interested in heterosexual preferences, we also dropped persons looking for same-sex partners or partners of both sexes. Moreover, we restricted the analysis to persons aged 18–80 years. Our final sample contained 2,672 persons (61.41% male).

The dependent variable in our analysis was the stated preference regarding the age of partners. Respondents could specify whether their ideal partner should be *younger*, *younger to almost equal*, *equal in age*, *almost equal to older*, or *older* on a 5-point scale ranging from 1 (*younger*) to 5 (*older*). Furthermore, respondents could specify that age *doesn't matter* (coded as 6). This enabled us to capture the subjective quality and relevance of age relations.

Independent variables were the respondent's educational level, age at interview, and whether he or she is looking for a long-term relationship, has been married previously, and whether he or she has children. Because there were about 23% missing values on the long-term relationship variable, we decided to set missing values to zero and control these cases with an additional binary indicator. Moreover, we included measures indicating respondent's absolute preferences for physical attractiveness, educational level, and age as partner features. Because we performed a case-wise deletion in order to have only complete cases, the final sample contained 1,370 men and 901 women. The appendix gives further information on the construction of our variables as well as their distribution.

We analyzed stated age preferences with multinomial logistic regression models because the outcome variable is a qualitative category.¹¹ We decided to use a multinomial rather than an ordinal model because in substantial terms the assumption and the modeling of the outcome as ordinal would be a severe misspecification.¹² Furthermore, the category *doesn't matter* prevents the outcome from being ordinally scaled. However, omitting this category would result in a potentially biased subsample of persons, namely, only those who specified a preference for an age relation. Moreover, we had a substantive interest in this particular outcome, because it expresses the respondent's indifference to specifying an age relation, which itself may vary by age and gender.

35,235 users were invited to participate in our survey. A detailed analysis of response can be found at Zillmann/Skopek/Schmitz/Blossfeld (2011).

- 11 The multinomial regression model (MRM) generalizes the binary logit model (outcomes are 0 or 1) by estimating the probability of one outcome over another in a set of qualitative outcomes (e.g., in our case, the probability of *younger* over *equal*). The multinomial model uses the data more efficiently than pairwise binary logit models, because it estimates parameters simultaneously. Thus, it can be understood as a linked set of binary logit estimations. However, because parameters can differ for each outcome, the MRM usually produces a lot of parameters. This makes it harder to interpret effects than in a binary logit model (see, for a detailed discussion, Long 1997).
- 12 Although the coding of relational age preference outcomes (1 to 6) might suggest that the categories have an ordinal structure, this does not have to be present within the actors' perception. For example, actors could have the subjective perception that they favored a partner of the same age compared to either younger *or* older partners.

To make the complex results easier to interpret, we plotted not only contrast effects for pairs of outcomes, but also discrete changes in outcome probabilities for a unit change in the independent variables while holding continuous variables constant at the sample mean and dummy-coded variables at the zero level. Logit coefficients for contrasts as well as discrete changes were estimated separately for men and women.

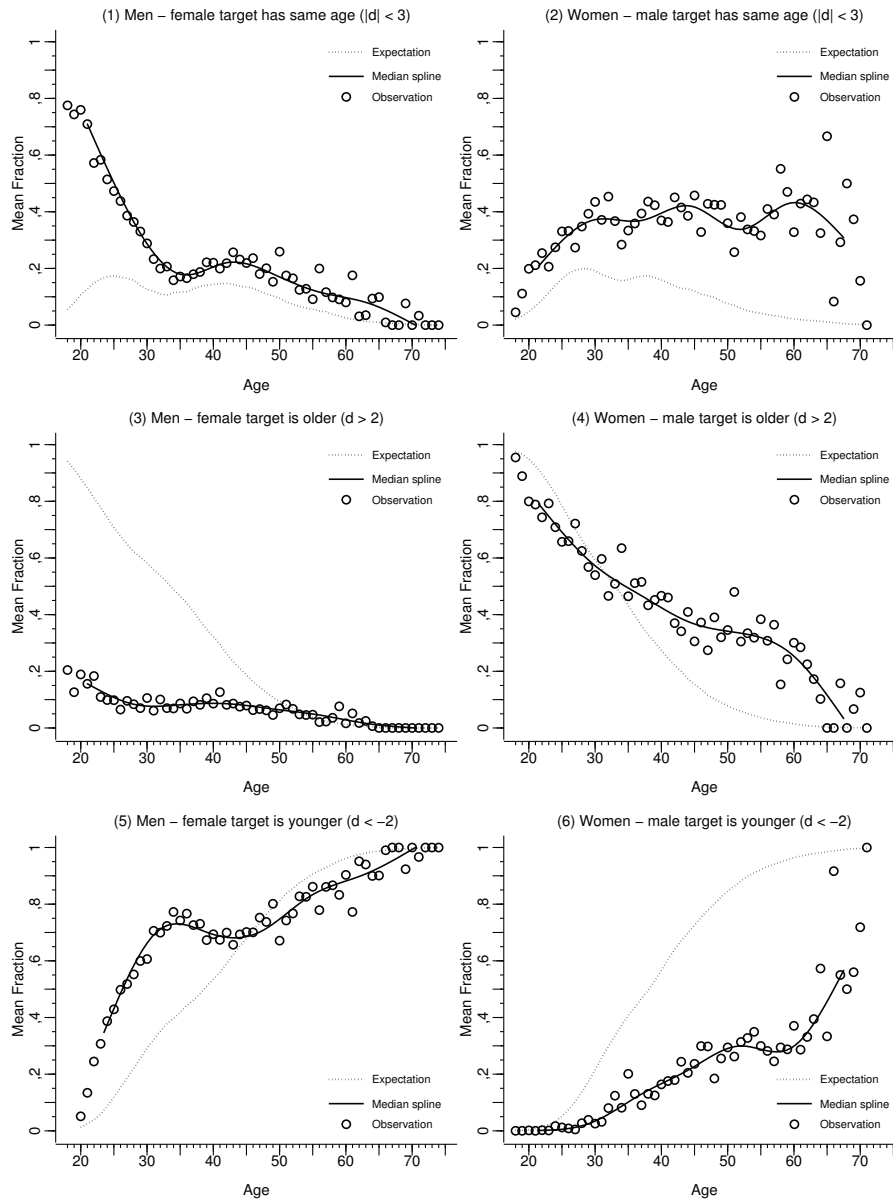
5. Results

We started by analyzing the patterns of age-related homophily and heterophily. These are depicted by the 2 x 3 collection of serially numbered graphs in Figure 1. Columns display the patterns for men contacting women (left) and women contacting men (right). The rows are organized into homophily (first row), hyperphily (second row), and hypophily (third row). Each plot shows observed (marked by a circle) and expected (dotted line) fractions over age. Expectations were computed under the assumption of a random match. In addition, a median spline provides a smoothed representation of the observed trend.

Graphs 1 and 2 in Figure 1 show that, on average, both men and women “preferred” homophilic age contacts to a greater extent than one could expect under random conditions. Nonetheless, the graphs display remarkable gender differences. For men, age homophily was very high at young age levels: More than 50% of first-time e-mails from men up to 25 years were addressed to women of similar age. However, the degree of men’s homophilic contacts declined strongly although remaining higher than chance. In contrast, women’s homophily increased over age, starting with relatively low values in women below 25 years (a maximum of 30%) and then oscillating considerably higher than expected at around 40% for higher ages.

Graphs 3 to 6 in Figure 1 show that heterophily diverged substantially between men and women. Only a small proportion of men contacted older women, and this was far below the proportion to be expected under the assumption of a random match (see Graph 3). Men’s low level of hyperphily in age decreased even further with age. Men increasingly avoided contacts with older women. Instead, the older they were, the more they favored increasingly younger women (see Graph 5). Thus, male hypophily in age increased strongly with age. At the age of about 30 years, more than 70% (expectation was 30%) of male initial contacts addressed women who were at least 3 years younger. This fraction is even larger – albeit in accordance with the expectation – for men older than 45 years. Women, in contrast, made more contacts with older men, which is more or less consistent with the expectation for women younger than 30 years and exceeds the expectation for women older than 30 (see Graph 4). However, at higher ages, women contacted older males less and less in absolute terms. Contacting younger men was very rare for women in their 20s or younger. With increasing age, hypophily also rose for women, albeit this increase lagged behind the statistical expectation of a random match (Graph 6). Note that there was a remarkable asymmetry between the age hyperphily of men and the age hypophily of women: Whereas women increasingly desired younger mates, men generally had less desire for older women and did not relax this preference as they got older.

Figure 1: Age homophily and heterophily in men and women initially contacting targets in online dating.



Note: The mean fraction of contacts targeting older, younger, and same-aged targets was calculated and plotted from users' initial contacting e-mails; calculation is based on 115,909 initial contact events and 10,427 initiating men and women; age difference d equals $Age^{target} - Age^{initiator}$, the difference between the age of target and the age of initiator.

Source: Database dump of a German dating site, first half-year of 2007.

Overall, these results reveal a highly age-dynamic and gendered pattern of contacting along age. When men are young, they mostly prefer women of the same age. As they grow older, they increasingly prefer younger women, and they vigorously avoid contacts with older women. In contrast, women prefer older men at younger ages, and their choices become more and more mixed at higher ages.

The normative approach postulating a norm of the “older man” accounts for the average pattern of men contacting younger women and women contacting older men. However, our results do not support the hypothesis that age preferences remain stable over age. In a similar vein, our results seem to question the idea that similarity in age is a culturally relevant factor. Instead, they indicate that youthful age is a crucial female resource on the partner market: As men get older, they have to “go down” further in age to reach a fixed female age ideal. In the next step, we shall examine this by assessing whether male preference for younger women is confounded with a preference for attractiveness.

All in all, our choice data were somewhat puzzling when it came to the role of male age in female choice. The hypothesized male-older preference in women seems to be confirmed only in younger women, whereas the structure of female choice in terms of male age seems to become more and more blurred as women get older. Therefore, our interim conclusion is that age influences men’s and women’s choices differentially and hence, the situation of both sexes differs increasingly with age. Evidently, women face difficulties with age: Whereas they are increasingly looking for men in the same age group, they are increasingly less favored by exactly these men.

After illustrating both the age-dependent reaction to a potential partner’s age in men and women and the created gender-specific opportunity structures, we shall now turn to the impact of this dynamic on the subjective level. The question arises whether the reported patterns of male and female choice regarding age are relevant for men’s and women’s subjective age preferences. Tables 1 and 2 report the results of the multinomial regression on male and female relational age preferences. Effects of independent variables are listed in columns. Comparisons of outcomes are organized in rows.¹³ To facilitate interpretation, we report plotted contrast effects for pairs of outcomes as well as discrete changes in outcome probabilities for a unit change in the independent variables (with continuous variables held at the sample mean and dummy-coded variables held at zero).¹⁴ In addition, Figure 2 plots the conditional effects of age on outcomes.

13 Beta coefficients indicate the effect on the log-odds (logits) for a unit change in the respective covariate. For example, coefficient $\beta_{1|2}$ for age (men) indicates that the logits of Outcome 1 versus Outcome 2 increase by 0.041 for an additional year in age, and that this effect is significant at a level of .001. The factor change in the odds (relative risk ratio) of 1 over 2 given a unit change in age can be derived readily by taking the exponent of $\beta_{1|2}$ ($\exp\{0.041\}=1.042$). Multiplying this by minus one gives the reversed contrast (e.g., $\beta_{2|1}=-\beta_{1|2}$). We also calculated each outcome’s predicted probability change for a discrete unit change in a covariate (denoted by $\Delta 1$) while holding all other variables constant. Note that the amount, significance, and direction of changes in the overall probability of an outcome depend strongly on the level of the covariate of interest as well as on the level of all other covariates in the model.

14 Therefore, we interpreted displayed discrete changes as changes in probability referring to a (hypothetical) person of average age, valuating importance of partner traits at an average level, and characterized by a medium educational level, low long-term commitment (and no missing value in that variable), no child, and not having been previously married.

Table 1: Estimates from multinomial logistic regression on stated age preferences of men (indep. variables in columns; discrete changes and logit effects reported)

Outcomes ^b	P(Y) ^c	%Age	Education level low	high	Long-term sought	Missing (long-term)	Previously married	Has children	Absolute preference for Looks	Education	Age
1 younger vs.	0.109	$\Delta 1$	0.006 ***	-0.004	0.077 **	0.023	0.003	0.019	0.024 *	-0.018 *	0.042 ***
2		β_{12}	0.041 ***	0.129	0.687 ***	0.199	0.056	0.273	0.171 +	-0.174 *	0.270 **
3		β_{13}	0.075 ***	-0.047	0.537 *	0.158	0.243	0.347	0.264 *	-0.193 +	0.228 +
4		β_{14}	0.088 ***	-0.404	0.714 *	0.097	-0.231	-0.344	0.467 ***	-0.132	0.462 ***
5		β_{15}	0.079 **	-1.280 +	0.226	0.103	0.435	0.016	-0.299	-0.390	0.721 **
6		β_{16}	0.088 ***	-0.175	0.519 *	0.381	0.089	-0.595 *	0.358 ***	-0.233 *	0.951 ***
2 younger or almost equal vs.	0.497	$\Delta 1$	0.006 ***	-0.076	-0.071 *	-0.002	-0.053	0.002	0.022	0.003	0.057 **
3		β_{23}	0.034 ***	-0.176	-0.150	-0.041	-0.030	0.048	0.092	-0.019	-0.042
4		β_{24}	0.047 ***	-0.533 +	0.026	-0.102	-0.504	0.051	0.296 **	0.042	0.192 +
5		β_{25}	0.039	-1.409 *	-0.461	-0.096	0.162	0.410	-0.471	-0.216	0.451 +
6		β_{26}	0.048 ***	-0.304	-0.168	0.182	-0.184	-0.200	0.186 *	-0.059	0.681 ***
3 equal vs.	0.125	$\Delta 1$	-0.003 **	0.001	-0.001	0.005	-0.010	-0.005	-0.006	0.003	0.020 +
4		β_{34}	0.013	-0.357	0.177	-0.061	-0.474	0.003	0.204	0.061	0.234 +
5		β_{35}	0.004	-1.233 +	-0.311	-0.055	0.188	0.362	-0.563 +	-0.197	0.493 +
6		β_{36}	0.013	-0.129	-0.018	0.223	-0.020	-0.248	0.094	-0.041	0.723 ***
4 almost equal or older vs.	0.065	$\Delta 1$	-0.002 **	0.029	-0.011	0.007	0.031	-0.003	-0.016 *	-0.002	-0.005
5		β_{45}	-0.008	-0.876	-0.487	0.006	0.666	0.360	-0.766 *	-0.257	0.259
6		β_{46}	0.001	0.229	-0.195	0.284	0.320	-0.251	-0.109	-0.101	0.490 ***
5 older vs.	0.008	$\Delta 1$	0.000	0.020	0.003	0.001	-0.002	-0.003	0.004	0.002	-0.003
6		β_{56}	0.009	1.105 +	0.292	0.278	-0.208	-0.346	0.657 *	0.156	0.230
6 doesn't matter vs.	0.196	$\Delta 1$	-0.007 ***	0.029	0.003	-0.033	0.014	0.044	-0.028 *	0.013	-0.111 ***

Significance: + $p \leq .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; Model Statistics: Log-Likelihood = -1878.227***, $R^2_{\text{Ageferke}} = .226$; $n = 1,370$
^a coefficients of independent variables are listed in columns; regression constants are not listed; logit coefficient β_{ijk} is the estimated effect for a unit change in a covariate on the log-odds (logits) of outcome k over outcome i ; the effect for β_{ijk} equals $-\beta_{jik}$ $\Delta 1$ equals the change in the predicted probability of an outcome if a covariate is increased by 1 unit holding metric variables at the sample mean and 0/1-coded variables at 0, ^b one-sided outcome comparisons in rows; ^c predicted probability of the outcome holding metric variables at the sample mean and 0/1-coded variables at 0.
 Source: Survey data on users of a German online dating site collected in 2009/2010.

Table 2: Estimates from multinomial logistic regression on stated age preferences of women (indep. variables in columns; discrete changes and logit effects reported)

Outcome ^b	P(Y) ^c	Age		Education level		Long-term sought	Missing (long-term)	Previously married	Has children	Absolute preference for		
		$\Delta 1$	$\Delta 1$	low	high					Looks	Education	
1 younger vs.	0.101	$\Delta 1$	0.008	0.046	-0.077	-0.063	-0.014	0.021	-0.080+	-0.004	0.023	-0.022
2		$\beta_{1 2}$	0.019	0.401	-1.333+	-0.722	-1.670+	0.158	-1.552*	-0.320	0.085	-0.088
3		$\beta_{1 3}$	0.065*	0.459	-1.410+	-0.840	-1.366	0.290	-1.466*	0.039	0.447	-0.420
4		$\beta_{1 4}$	0.120***	0.576	-1.411+	-1.128*	-1.665+	0.166	-1.711**	0.015	0.214	-0.398
5		$\beta_{1 5}$	0.197***	-0.029	-1.429+	-1.903**	-1.954*	-0.142	-1.904**	-0.012	-0.142	-0.166
6		$\beta_{1 6}$	0.070*	0.175	-1.878*	-1.049+	-1.758*	0.388	-1.582**	-0.088	0.313	0.296
2 younger or almost equal vs.	0.133	$\Delta 1$	0.008*	-0.003	-0.010	-0.030	0.002	0.004	0.001	0.037*	0.019	-0.017
3		$\beta_{2 3}$	0.046**	0.058	-0.077	-0.118	0.304	0.132	0.086	0.358*	0.362*	-0.333*
4		$\beta_{2 4}$	0.100***	0.175	-0.078	-0.406	0.005	0.008	-0.159	0.335*	0.129	-0.311*
5		$\beta_{2 5}$	0.178***	-0.430	-0.096	-1.181*	-0.284	-0.300	-0.352	0.308	-0.227	-0.078
6		$\beta_{2 6}$	0.050***	-0.226	-0.545+	-0.327	-0.088	0.230	-0.030	0.232	0.228	0.384**
3 equal vs.	0.196	$\Delta 1$	0.003	-0.015	0.000	-0.025	-0.039	-0.019	-0.014	-0.016	-0.043*	0.040
4		$\beta_{3 4}$	0.055***	0.117	0.000	-0.288	-0.299	-0.124	-0.245	-0.023	-0.233*	0.022
5		$\beta_{3 5}$	0.132***	-0.488	-0.019	-1.062*	-0.588	-0.432	-0.438	-0.050	-0.589***	0.254
6		$\beta_{3 6}$	0.005	-0.285	-0.467	-0.208	-0.392	0.098	-0.116	-0.127	-0.134	0.716***
4 almost equal or older vs.	0.403	$\Delta 1$	-0.017***	-0.073	0.001	0.067	0.007	0.009	0.075	-0.023	0.005	0.073**
5		$\beta_{4 5}$	0.078***	-0.605+	-0.019	-0.774+	-0.290	-0.308	-0.193	-0.027	-0.356*	0.232+
6		$\beta_{4 6}$	-0.050***	-0.401	-0.467+	0.080	-0.093	0.222	0.129	-0.103	0.099	0.694***
5 older vs.	0.026	$\Delta 1$	-0.003*	0.013	0.001	0.040*	0.027	0.010	0.011	-0.001	0.010+	-0.001
6		$\beta_{5 6}$	-0.128***	0.204	-0.448	0.854+	0.196	0.530	0.322	-0.076	0.456**	0.462***
6 doesn't matter	0.142	$\Delta 1$	0.001	0.032	0.085*	0.011	0.017	-0.026	0.006	0.007	-0.012	-0.073***

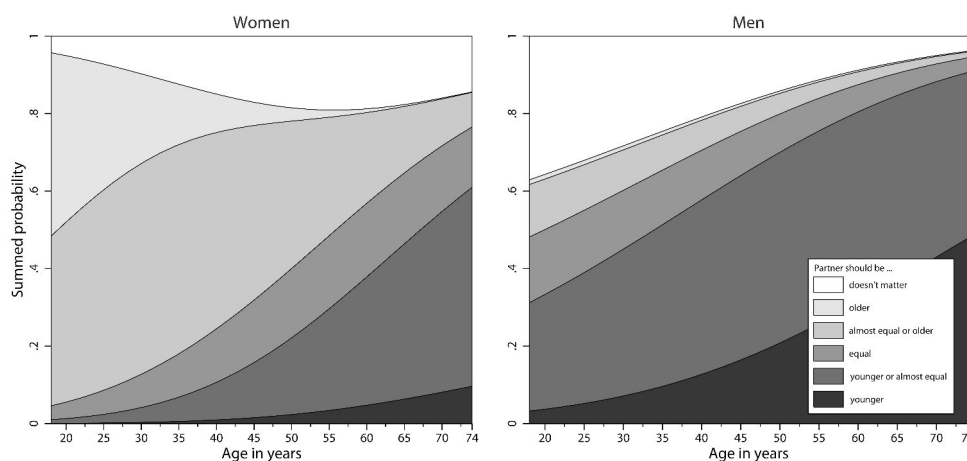
Significance: + $p \leq .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; Model Statistics: Log-Likelihood = -1229.462***, $R^2_{\text{Nagelkerke}} = .296$; $n = 901$

^a coefficients of independent variables are listed in columns; regression constants are not listed; logit coefficient β_{ijk} is the estimated effect for a unit change in a covariate on the log-odds (logits) of outcome k over outcome i ; the effect for β_{ijk} equals $-\beta_{ijk}$; $\Delta 1$ equals the change in the predicted probability of an outcome if a covariate is increased by 1 unit holding metric variables at the sample mean and 0/1-coded variables at 0; ^b one-sided outcome comparisons in rows; ^c predicted probability of the outcome holding metric variables at the sample mean and 0/1-coded variables at 0.

Source: Survey data on users of a German online dating site collected in 2009/2010.

Table 1 shows that age significantly influenced men's preferences for female age. Holding other variables constant, a one unit increase in men's age made the preference for a *younger* woman (Outcome 1) more likely over remaining outcomes. Similarly, the probability of *younger or almost equal* (Outcome 2) increased with age, although the effect was stronger on Outcome 1, because the odds of Outcome 1 over Outcome 2 themselves increased significantly for each year of age. In contrast, other outcomes became less likely with age. Discrete changes suggested that the loss in probability was largest for the indifference preference (Outcome 6). Figure 2 plots the conditional effect of age on probabilities in order to visualize this finding. Very much in line with our prior results, there was a distinct age-graded shift in men's preference for younger women. Older men increasingly preferred younger women and were less interested in the indifference outcome (6 = *doesn't matter*).

Figure 2: Conditional effect of age on preference outcomes in men and women.



Note: Predicted probabilities of preferential outcomes summing to one were plotted by age; predictions were based on the multinomial regression model in Tables 1 and 2; effect of age was conditional on holding the other variables in the model at the mean of the respective estimation sample (men and women).

Source: Survey data on users of a German online dating site collected in 2009/2010.

Age had a significant effect on preferential outcomes for women as well (see Table 2). Contrasting logit coefficients indicated that compared to the remaining outcomes, the desire for a man to be *older* or *almost equal or older* declined significantly with age. Even more, the preference for *older* men vanished almost completely with age. This can be confirmed by an inspection of the area plot in Figure 2. Moreover, the older the woman, the more likely she was to state a preference for men who are *younger* or *younger or almost equal* compared to other outcomes. In contrast to men, the probability of the indifference outcome (*doesn't matter*) increased with women's age (odds of 6 over 4 and 6 over 5 increased significantly by age). One possible explanation for this pattern is that

older women abandon their original (age) preferences due to their deteriorating chances of finding a partner. Compared to the *older men* preference (Outcomes 4 and 5), the *same-age men* preference (Outcome 3) became more probable with age. However, the overall probability of Outcome 3 increased only marginally with age. When analyzing who is contacting whom regarding age (see Figure 1), we found that, with increasing age, female choice along age became less uniform and increasingly mixed. Analyses of stated preference painted a similar picture: Female age preferences became rather idiosyncratic and diversified among older women (see Figure 2).

We expected age preferences to be *confounded* with preferences for other traits. In particular, we hypothesized that men's age preferences would correspond with their absolute preference for physical attractiveness. As logit contrasts and discrete changes in Table 1 show, the more "looks" were preferred as an important partner trait, the higher the probability of desiring a *younger* or *younger or almost equal* female partner over other outcomes and the lower the probability of indifference (age of partner *doesn't matter*). Interestingly, there was a similar effect for women: the more "looks" were rated as a relevant partner feature, the more likely women were to state a preference for *younger or almost equal* partners. In other words, age preferences are partially a function of preferences for physical attractiveness—not only for men but also for women.¹⁵

Furthermore, the more women emphasized education as an important partner feature, the stronger their age preference shifted from *equal* and *doesn't matter* to *almost equal* or *older* or *older men*. Thus, women's age preferences seemed to be confounded with preferences for educational (and hence economic) status. But there was also an effect for men: the stronger the preference for female educational status, the less likely the preference for *younger* women compared to other preferences. Interestingly, men tended to shift to *doesn't matter* rather than to the older category. Thus, a high absolute preference for education seems to be associated with age preferences for women but not for men. Furthermore, men, but not women, showed a greater indifference toward a potential partner's age when they had a high absolute preference for education.

The importance of age as a partner feature decreased the indifference regarding the age relation for both women and men. The higher the importance of age, the stronger the preference for *younger*, *younger or almost equal*, or *equal* women in men and the stronger the preference for *equal* or *almost equal* or *older* men in women.

We hypothesized that men with a higher education would be more favored on the market and therefore might have evolved a stronger preference for younger women. This was confirmed by our data analysis (see Table 1). A high level of education significantly increased the probability of Outcome 1 over all other outcomes. There was a difference of about +7.7 percentage points in the probability of Outcome 1 for a hypothetical man (see above) with a high compared to a medium level of education. In contrast to men, female odds in favor of Outcome 1 compared to the remaining outcomes were reduced (albeit just on a 10% level of significance for most contrasts) and odds in favor of Outcome 6 were increased for more highly educated women (see Table 2). This means that, com-

15 This result seems to contradict common biological assumptions in evolutionary psychology (Buss 1989).

pared to women with medium level of education, more highly educated women preferred younger men less often and were more frequently indifferent about the age of the partner.

Seeking a long-term relationship influenced age preferences in women but not in men. This did not support our hypothesis that men with a long-term goal frame would more often prefer women of a similar age. Evidently, by and large, male age preferences are independent from the desired level of involvement in a relationship. In line with our hypotheses, women interested in a long-term relation significantly preferred men to be *older* or *almost equal or older*. When there was no a priori long-term interest, women showed a stronger preference for younger as well as same-aged men.

Our theoretical discussion suggested that having children or the experience of a previous marriage might be conceived as unfavorable traits in the partner market, and that actors with such characteristics would therefore adjust their preference structure for partner's age. Our results indicated that men with children stated a weaker preference for younger women and were more often indifferent regarding female age. The male's deviation from the modal age preference together with a greater expression of indifference can be interpreted as a sign of men's adjustment to a restricted position in the mate market. For women, having a child was associated with both a weaker preference for younger men and a stronger preference for *older* or *almost equal or older* men. The "costs" of having children in the perspective of others seemed to lead women to refrain from female modal age preference. However, having been married previously had no significant impact on female or male preferences. Previous marriage experience might not be a "cost" per se in the perspective of others, but rather a characteristic defining different segments in the market. That is, individuals who have been married before might prefer partners with similar marriage experience, but this has little to do with their preference regarding a partner's age.

6. Discussion of results and conclusion

This study traced back age-related partner preferences to men's and women's age, their position in the partner market (their resource set), and their conception of an ideal partner (their preference set). Using process data from online dating, we were able to show that revealed age preferences vary strongly with age, but in a gender-specific manner: Whereas (a) men increasingly prefer younger women as they age, (b) women's age preferences become increasingly diverse. Using multinomial regression models, we corroborated these findings on the level of stated relational age preferences and additionally demonstrated that (c) age preferences are confounded with preferences for attractiveness and education in a gender-specific way, and that (d) preferences for age also vary with market-relevant traits such as education and parenthood, but not with prior marital experience.

Altogether, our analyses point to a gender-specific dynamic of age with differential consequences for men's and women's mating preferences: Age has a different meaning for men and women. Hence, they face different conditions on the partner market as they age, and this has a differential effect on their mate value. In particular, women face restrictions on the mate market with increasing age. Whereas they are increasingly looking for similar aged men, they are less favored by men of their own age group. Thus, men and women face a disproportionate decline in market value: Male chances of realizing mating

preferences stay constant or become better; female chances become worse with age. This has far-reaching consequences for actors who tend to adapt their preferences to the structural market conditions. The age preferences that are put into practice differentially shape the opportunity structures of men and women on the partner market, and hence can influence the preferences of others.

We conclude that both normative explanations for assortative mating along age and the axiomatic assumption of similarity preferences have been considered too narrowly and need to be handled with more care in future research. As western societies become older, and people increasingly tend to repartner and remarry, mate choice will increasingly become a phenomenon of age. This also increases the need to analyze it scientifically. Our finding that women's preferences become increasingly heterogeneous with age might well be a substantive issue for further research. Future studies should also assess how far the proposed approach can be applied to other preference dimensions (e.g., preference for status traits). One methodologically relevant field of research would be the integration of the different information on stated and revealed mating preferences and analyses of how far subjective preferences and choice behavior are congruent. Finally, our results might inspire further studies on age homogamy to account for gender-specific preference variability from a life-course perspective.

7. Acknowledgements

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References

- Atkinson, M. P. & Glass, B. L. (1985). Marital age heterogamy and homogamy, 1900 to 1980. *Journal of Marriage and the Family*, 47, 3, pp. 685-691.
- Becker, G. S. (1973). A theory of marriage: Part I. *The Journal of Political Economy*, 81, 4, pp. 813-846.
- Ben-Akiva, M., Bradley, M., Morikawa, T., Benjamin, J., Novak, T., Oppewal, H. & Rao, V. (1994). Combining revealed and stated preferences data. *Marketing Letters*, 5, 4, pp. 335-349. DOI: 0.1007/BF00999209.
- Berman, P. W., O'Nan, B. A. & Floyd, W. (1981). The double standard of aging and the social situation: Judgments of attractiveness of the middle-aged woman. *Sex Roles*, 7, pp. 87-96.
- Blau, P. M. (1964). *Exchange and power in social life*. New York, NY: Wiley.
- Blossfeld, H.-P. & Timm, A. (1997). Der Einfluss des Bildungssystems auf den Heiratsmarkt: Eine Längsschnittanalyse der Wahl des ersten Ehepartners im Lebenslauf. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 49,3, pp. 440-476.
- Brehm, S., & Miller, R. S. (2002). *Intimate relationships*. McGraw-Hill series in social psychology. Boston, MA: McGraw-Hill (3rd edition).

- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, pp. 1-49.
- Buunk, B. P., Dijkstra, P., Kenrick, D. T. & Warntjes, A. (2001). Age preferences for mates as related to gender, own age, and involvement level. *Evolution and Human Behavior*, 22, 4, pp. 241-250.
- Bytheway, W. R. (1981). The variation with age of age differences in marriage. *Journal of Marriage and the Family*, 43, 4, pp. 923-927.
- Cox, P. R. (1970). International variations in the relative ages of brides and grooms. *Journal of Biosocial Science*, 2, 02, pp. 111-121.
- Cuber, J. F. (1971). May-September marriages. *Sexual Behavior*, 1, pp. 9-17.
- Deutsch, F. M., Zalenski, C. M., & Clark, M. E. (1986). Is there a double standard of aging? *Journal of Applied Social Psychology*, 16, pp. 771-785.
- Dion, K. K., Berscheid, E. & Walster, E. (1972). What is beautiful is good. *Journal of Personality and Social Psychology*, 24, 3, pp. 285-290.
- Edwards, J. N. (1969). Familial behavior as social exchange. *Journal of Marriage and the Family*, 31, 3, pp. 518-526.
- Elder, G. H. (1969). Appearance and education in marriage mobility. *American Sociological Review*, 34, 4, pp. 519-533.
- Elster, J. (1986). *Rational choice*. Oxford, England: Basil Blackwell.
- England, P. & McClintock, E. A. (2009). The gendered double standard of aging in US marriage markets. *Population and Development Review*, 35, 4, pp. 797-816.
- Engstler, H. & Menning, S. (2003). Die Familie im Spiegel der amtlichen Statistik: Lebensformen, Familienstrukturen, wirtschaftliche Situationen der Familien und familiendemographische Entwicklung in Deutschland. Bonn: Bundesministerium für Familien, Senioren, Frauen und Jugend.
- Fiore, A., Taylor, L. S., Zhong, X., Mendelsohn, G. & Cheshire, C. (2010). Who is right and who writes: People, profiles, contacts, and replies in online dating. *Proceedings of the Annual Hawaii International Conference on System Sciences*, 43, pp. 1-10.
- Henss, R. (1991). Perceiving age and attractiveness in facial photographs. *Journal of Applied Social Psychology*, 21, pp. 933-946.
- Hitsch, G., Hortaçsu, A. & Ariely, D. (2010). What makes you click? – Mate preferences in online dating. *Quantitative Marketing and Economics*, 8, 4, pp. 393-427. DOI: 10.1007/s11129-010-9088-6.
- Hollingshead, A. B. (1950). Cultural factors in the selection of marriage mates. *American Sociological Review*, 15, 5, pp. 619-627.
- Kalmijn, M. & Flap, H. (2001). Assortative meeting and mating: Unintended consequences of organized settings for partner choices. *Social Forces*, 79, 4, pp. 1289-1312.
- Klein, T. (1996a). Der Altersunterschied zwischen Ehepartnern: Eine kritische Diskussion familiensoziologischer Theorienansätze. *Zeitschrift für Bevölkerungswissenschaften*, 21, 3, pp. 281-302.
- Klein, T. (1996b). Der Altersunterschied zwischen Ehepartnern: Ein neues Analysemodell. *Zeitschrift für Soziologie*, 25, 5, pp. 346-370.
- Lankuttis, T., & Blossfeld, H.-P. (2003). Determinanten der Wiederheirat nach der ersten Scheidung in der Bundesrepublik Deutschland. *Zeitschrift für Familienforschung*, 15, 1, pp. 5-24.
- Lazarsfeld, P. & Merton, R. K. (1954). Friendship as a social process. In: Berger, M., Abel, T. & Page, C. H. (Eds.), *Freedom and control in modern society*. New York, NY: Van Nostrand, pp. 18-66.
- Lewis, R. A. & Spanier, G. B. (1979). Theorizing about the quality and stability of marriage. In: Burr, W. R., Reiss, L. L., Hill, R. & Nye, F. I. (Eds.), *Contemporary theories about the family: General theories and theoretical orientations*. New York, NY: Free Press, pp. 268-294.
- Long, J. S. (1997). *Regression models for categorical and limited dependent variables. Advanced quantitative techniques in the social sciences series: Vol. 7*. Thousand Oaks, CA: Sage.
- McPherson, M., Smith-Lovin, L. & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology*, 27, pp. 415-444.
- Öberg, P. & Tornstam, L. (1999). Body images among men and women of different ages. *Aging and Society*, 19, pp. 629-644.

- Oppenheimer, V. K. (1988). A theory of marriage timing. *American Journal of Sociology*, 94, 3, pp. 563-591.
- Penke, L., Todd, P. M., Lenton, A. P. & Fasolo, B. (2008). How self-assessments can guide human mating decisions. In: Geher, G. & Miller, G. F. (Eds.), *Mating intelligence: Sex, relationships, and the mind's reproductive system*. New York, NY: Erlbaum, pp. 37-76.
- Presser, H. B. (1975). Age differences between spouses: Trends, patterns, and social implications. *American Behavioral Scientist*, 19, 2, pp. 190-205.
- Schmitz, A., Skopek, J., Schulz, F., Klein, D. & Blossfeld, H.-P. (2009). Indicating mate preferences by mixing survey and process-generated data: The case of attitudes and behaviour in online mate search. In: Baur, N. (Ed.), *Vol. 34 (1). Historical social research special issue. Linking theory and data. Process-generated and longitudinal data for analysing long-term social processes*. Cologne, Germany: Zentrum für Historische Sozialforschung, pp. 77-93.
- Shorter, E. (1977). *The making of the modern family*. New York, NY: Basic Books.
- Skopek, J., Schulz, F. & Blossfeld, H.-P. (2009). Partnersuche im Internet: Bildungsspezifische Mechanismen bei der Wahl von Kontaktpartnern. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 2, pp. 183-210.
- Skopek, J., Schulz, F. & Blossfeld, H.-P. (2011). Who contacts whom? Educational homophily in online mate selection. *European Sociological Review*, 27, 2, pp. 180-195.
- Sontag, S. (1979). The double standard of aging. In: Williams, J. (Ed.), *Psychology of women*. New York, NY: Academic Press, pp. 462-478.
- South, S. J. (1991). Sociodemographic differentials in mate selection preferences. *Journal of Marriage and the Family*, 53, 4, pp. 928-940.
- Spanier, G. B. & Glick, P. C. (1980). Mate selection differentials between Whites and Blacks in the United States. *Social Forces*, 58, 3, pp. 707-725.
- Stauder, J. (2008). Opportunitäten und Restriktionen des Kennenlernens. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 60, 2, pp. 266-286.
- Stevens, G., Owens, D. & Schaefer, E. C. (1990). Education and attractiveness in marriage choices. *Social Psychology Quarterly*, 53, 1, pp. 62-70.
- Taylor, P. A. & Glenn, N. D. (1976). The utility of education and attractiveness for females' status attainment through marriage. *American Sociological Review*, 4, 3, pp. 484-498.
- Todd, P. M. & Miller, G. F. (1999). From pride and prejudice to persuasion: Satisficing in mate search. In: Gigerenzer, G. & Todd, P. M. (Eds.), *Simple heuristics that make us smart*. New York, NY: Oxford University Press, pp. 287-308.
- van de Putte, B. & Matthijs, K. (2001). Romantic love and marriage: A study of age homogamy in 19th Century Leuven. *Belgisch Tijdschrift voor Nieuwste Geschiedenis*, XXXI, 3-4, pp. 579-619.
- van de Putte, B., van Poppel, F., Vanassche, S., Sanchez, M., Jidkova, S., Eeckhaut, M. & Matthijs, K. (2009). The rise of age homogamy in 19th century western Europe. *Journal of Marriage and Family*, 71, 5, pp. 1234-1253.
- van Poppel, F., Liefbroer, A. C., Vermunt, J. K. & Smeenk, W. (2001). Love, necessity and opportunity: Changing patterns of marital age homogamy in the Netherlands, 1850-1993. *Population Studies*, 55; 1, pp. 1-13.
- Vera, H., Berardo, D. H., & Berardo, F. M. (1985). Age heterogamy in marriage. *Journal of Marriage and the Family*, 47, 3, pp. 553-566.
- Vera, H., Berardo, F. M. & Berardo, D. H. (1987). On gold diggers: Status gain or loss in age heterogamous marriages. *Journal of Aging Studies*, 1, 1, pp. 51-64.
- Vera, H., Berardo, F. M. & Vandiver, J. S. (1990). Age irrelevancy in society: The test of mate selection. *Journal of Aging Studies*, 4, 1, pp. 81-95.
- Verbrugge, L. M. (1977). The structure of adult friendship choices. *Social Forces*, 56, 2, pp. 576-597.
- Zillmann, D., Skopek, J., Schmitz, A. & Blossfeld, H.-P. (2011). *Prozesse der Partnerwahl bei Online-Kontaktbörsen – Methodenbericht zur Teilnahmebereitschaft bei einem Online-Panel*. Bamberg: Universität Bamberg (Unpublished manuscript).

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Addresses of the authors/Anschriften der Autoren:

Dr. Jan Skopek (Corresponding author/Korrespondenzautor)
Nationales Bildungspanel NEPS
Wilhelmsplatz 3
96047 Bamberg
Germany/Deutschland

Andreas Schmitz, M. A.
Prof. Dr. Dr. h.c. Hans-Peter Blossfeld

Lehrstuhl Soziologie I
Otto-Friedrich-Universität Bamberg
Postfach 1549
96045 Bamberg
Germany/Deutschland

E-Mail: jan.skopek@uni-bamberg.de
andreas.schmitz@uni-bamberg.de
hans-peter.blossfeld@uni-bamberg.de

Appendix: see page 290

Description of dependent and independent variables for stated preference analysis. Distributional information for complete cases.

Variable	Men ($n = 1,370$)			Women ($n = 901$)			Description				
	mean	SD	P^{50}	min	max	min		max			
Age preference	3.05	1.79	2	1	6	3.95	1.28	4	1	6	Respondents were asked: "How old should your partner be?" Response categories were scaled gradually from <i>younger</i> to <i>older</i> around the middle category <i>equal</i> . Furthermore, respondents could specify indifference by an additional category <i>doesn't matter</i> . 1 = <i>younger</i> , 2 = <i>younger or almost equal</i> , 3 = <i>equal</i> , 4 = <i>almost equal or older</i> , 5 = <i>older</i> , 6 = <i>doesn't matter</i>
Age	40.84	12.23	41	18	79	42.01	12.23	43	18	74	Age at time of interview
Educational level	We applied a threefold classification for education very similar to that in Blossfeld and Timm (1997) combining information on general education and vocational qualification.										
Low	0.11	0.31	0	0	1	0.13	0.34	0	0	1	(1) no general educational degree, (2) general elementary education without vocational training, (3) intermediate general education without vocational training.
Medium	0.65	0.48	1	0	1	0.62	0.49	1	0	1	(1) general elementary education as well as vocational training, (2) intermediate general education as well as vocational training, (3) higher education entrance qualification (e.g., <i>Abitur</i>) without and (4) with vocational training
High	0.24	0.43	0	0	1	0.24	0.43	0	0	1	(1) lower tertiary (e.g., university of applied sciences), (2) higher tertiary (e.g., academically oriented university education), or (3) PhD
Long-term	0.69	0.46	1	0	1	0.62	0.49	1	0	1	Desire for a long-term relationship scaled from 1 to 5. Long-term equals 1 for values 4 or 5 and equals 0 otherwise. Missing values were coded to 0 (missing coding).
Missing (long-term)	0.16	0.37	0	0	1	0.25	0.43	0	0	1	1 if Long-term was coded as missing, 0 otherwise.
Previously married	0.41	0.49	0	0	1	0.60	0.49	1	0	1	1 if person was ever married, 0 otherwise.
Having children	0.40	0.49	0	0	1	0.64	0.48	1	0	1	Having children, coded by 1 and 0.
Absolute preferences for	Question: "How important are these features of a partner to you?" Answers are scaled from 1 (<i>very unimportant</i>) to 5 (<i>very important</i>).										
Looks	3.63	0.99	4	1	5	3.64	0.86	4	1	5	"Looks"
Education	3.31	1.11	3	1	5	3.96	0.98	4	1	5	"Educational level"
Age	3.32	1.04	3	1	5	3.68	1.00	4	1	5	"Age"

Note: Means, standard deviations, medians (P^{50}), and minimum and maximum values of variables were calculated for complete cases sample.

Source: Survey data on users of a German online dating site collected in 2009/2010.