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The Terminal Investment Hypothesis and Age-related Differences in Female Preference for Dads vs. Cads

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Williams' (1966) terminal investment hypothesis states that in species showing an age-related decline in reproductive value, reproductive effort should increase with age. Non-human primate studies have supported this hypothesis, though research in humans is lacking, likely due to the restricted age range of participants in typical studies in evolutionary psychology. We hypothesize that older women will decrease mating effort in order to allocate additional resources to parental effort, and that this shift will be manifested in women's' mate selection preferences. Because older women are hypothesized to shift resources from mating to parenting, they may show greater preferences for partners with high potential for paternal investment compared to partners with features signaling high potential for genetic investment. We use character sketches of "dad" and "cad" male reproductive strategies to demonstrate the age-related shift in relationship preferences. We found that older women prefer mating strategies that are related with higher paternal investment. In addition, we found that a woman's self-description changes with age, mediating the age-related changes in mate preferences. We suggest that these changes serve the changing needs of an older woman and the transition from investing in future offspring to investment in the current offspring.

Keywords
life history, mate selection, age, terminal investment hypothesis

Introduction

Human females show an age-related decline in reproductive value due to a decline in fertility (Fauser et al., 2005). The terminal investment hypothesis states that in species showing an age-related decline in reproductive value, reproductive effort should increase with age (Williams, 1966). Studies on humans, showing that reproductive effort increases with age, are lacking (Fessler, Navarrete, Hopkins, & Izard, 2005).

Life History Theory (Wilson, 1975) states that individuals allocate resources to competing fitness components such as somatic effort, mating effort or parental effort. In accordance with the terminal investment hypothesis, as females age it is in their best interest to transfer more resources from mating effort to parental (reproductive) effort. This shift also has specific implications for mating strategy. We hypothesize that in order to maximize their reproductive success; older females will prefer long-term over short-term reproductive strategies. This is due to the fact that as females age, they have a smaller chance of bringing additional offspring and therefore they need to invest in existing offspring (Pianka, 1976). Long-term strategies, such as choosing a stable, faithful mate, may assist the female to raise her existing offspring, while short-term strategies, such as choosing a handsome mate with good genes, may not.

Draper and Belsky (1990) propose that men have evolved to specialize in either short-term "cad" (aggressive and rebellious) or long-term "dad" (compassionate and industrious) mating strategies.

H1: Older women will have greater tendencies to rate dads as more attractive for a long-term relationship compared to cads. Previous studies have shown that when searching for a long-term partner, women favor traits such as resources, kindness, and intelligence (Li & Kenrick, 2006); these traits are portrayed in the dad. We suggest that this tendency grows stronger as a woman ages due to her growing emphasis on parental effort, including the increased value of paternal effort. Older women may also have greater tendencies to rate dads as more attractive for short-term relationships and brief sexual affairs compared to cads, as there is some chance that these encounters would lead to longer pair-bonds (Li & Kenrick, 2006).

H2: Older women will identify their own characteristics as bearing a greater resemblance to a dad than to a cad, even more so than younger women. This reflects a greater emphasis on parental investment and long-term, risk-averse strategies as compared to short-term mating effort and higher-risk strategies.

H3: Women's self-reported resemblance to dads vs. cads will mediate the effect of age on mate preference. Self-reported resemblance in personality to dads vs. cads will mediate the effect of age on the attractiveness of long-term relationships (3a), the attractiveness of short-term relationships (3b), and the attractiveness of brief sexual affairs (3c).

H4: As women age they will be less inclined to-

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Table 1. Correlation of Women's Age and Difference in Attractiveness between Dad and Cad

Country	*N*	1	2	3
English	357	.12*	.06	.03
Chinese	350	- .01	.07	.09*
Korean	166	.17*	.02	.03
Croatian	136	.17*	.20**	.20**
American	112	.05	.02	.04
Argentinean	96	.04	.32**	.09
Total	902	.10*	.10*	.10*
Full sample	1357	.14*	.09*	.09*

Note.
1 = Long-term relationship
2 = Short-term relationship
3 = Brief sexual affair attractiveness
* p < .05. ** p < .01.

wards sexual affairs with either dads or cads. This reflects a shift in focus from short-term mating effort, which could result in father-absent offspring, to high parental investment.

Materials and Methods

Descriptive passages (200-300 words) of a prototypical proper hero dad, Waverley from Waverley (1814) by Walter Scott, and a prototypical dark hero cad, George Staunton from The Heart of Midlothian (1818) by Walter Scott, utilized in Kruger, Fisher, and Jobling (2003) were translated into non-English languages. Participants rated online how likely they would be to have long-term committed, short-term, and brief sexual relationships with each character on an eleven-point scale of deciles ranging from 0% to 100%.

Results

The study included 1365 women from countries including England, China, Korea, Croatia, United States, Argentina, Israel, Germany, Mexico, Japan, and India. Full data was collected from 1357 of the respondents. Their ages (M = 24.2, SD = 7.2) ranged from 14 to 68, with 48% above the upper end of the traditional undergraduate age range (22 years). In accordance with previous studies, women described themselves more as a dad than as a cad, $t(1364) = 30.05$, $p < .001$, and rated the dad higher than the cad as a long-term partner, $t(1365) = 23.72$, $p < .001$, and lower for a brief sexual affair, $t(1363) = -16.23$, $p < .001$.

Scores for the cad items were subtracted from the scores from the corresponding dad items to generate scores indicating the strength of the difference in identification with and preferences for dads compared to cads. Difference scores were computed for each of the following items: (1) self description, (2) long-term relationship attractiveness, (3) short-term (2 month) relationship attractiveness, and (4) brief sexual affair attractiveness. Difference scores were correlated with age in SPSS 16 to test H1 and H2. In the full sample age was correlated with all four difference scores. H1 was supported; older women had a greater tendency to rate dads as more attractive for a long-term relationship compared to cads, $r(1354) = .14$, $p < .001$. Similar results were obtained for short-term relationships, $r(1352) = .09$, $p = .001$, and brief sexual affairs, $r(1352) = .09$, $p = .001$. H2 was also supported; older women identified their own characteristics as bearing a greater resemblance to a dad than to a cad, more so than younger women, $r(1353) = .16$, $p < .001$.

Since the general sample included 13 cultural groups who differed in age, we attempted to control for cultural differences. In order to do so we selected the six cultures that included the largest samples (see Table 1). All 24 correlations between age and difference scores in each of these samples were positive, as expected, except for one. From these correlations it seems that although there are cultural differences in the magnitude of the correlation of age with the difference in attractiveness between dad and cad, the overall trend is as hypothesized.

In order to test H3 that women's self-reported resemblance to dads vs. cads mediates the effect of age on mate preference, three path models were created with AMOS 16. The models depicted both a direct relationship between age and difference score, and a relationship mediated by the difference score for self-reported resemblance. The hypothesis was supported for all three variables. Model A indicated that age had a weak but significant direct effect on character difference in long-term relationship attractiveness once the path mediated by respondent personality was controlled for. Model B indicated that the relationship between age and character difference in short-term relationship attractiveness was completely mediated by respondent personality. Model C indicated that age had a weak but significant direct effect on character difference in brief sexual affair attractiveness once the path mediated by respondent personality was controlled for.

H4 was supported in the full sample; age was inversely related to the reported likelihood of brief sexual affairs with both dads and cads, $r(1353) = .16$, $p < .001$.

Discussion

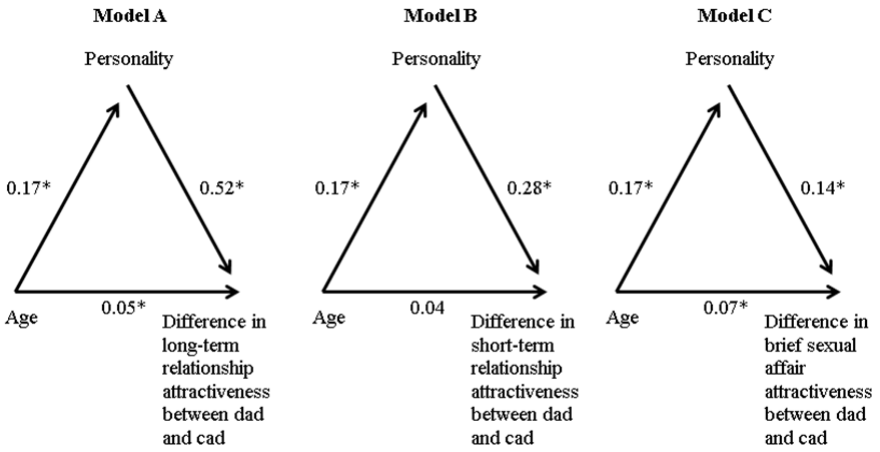

Figure 1. Path analysis model of personality as mediator of the relation between age and mate attractiveness. Data are standardized path cofficients for unique relationships. $^{*}p < .05$.

The terminal investment hypothesis states that reproductive effort should increase with age. Accordingly, we speculated that the mating strategy of women would change with age such that older women will favor signs of paternal investment.

Generally, women tend to prefer dads for long-term relationships and cads for short-term romantic affairs (Kruger & Fisher, 2005). Dads represent kindness and stability, traits that women value in long-term relationships (Draper & Belsky, 1990). We found that the preference for dads over cads for long-term relationships is stronger in older than in younger women. Older women have lower levels of fertility and are therefore inclined to invest in their current offspring instead of attempting to bear new ones. In such a state, it would be preferential for a woman to seek out long-term mates who would invest resources in the family unit. In contrast to younger women, who may be more willing to trade off paternal investment for genetic investment, older women are less attracted by the genetic quality of their partner because their chances for having future offspring are lower. In a longitudinal study, 27 couples were assessed in their first and third years of marriage (Shackelford, Schmitt, & Buss, 2005). After three years of marriage, both women and men placed greater weight on the agreeableness of their spouse as a desired trait. A similar trend was noted for the dependable nature of the spouse. One way of interpreting these results, as well as the results of the present study, is that living in a long-term relationship changes mating preferences. Another way of interpreting these results is that as time passes, the aging process in both women and men may increase preferences for agreeableness and dependability. This strategy would cause a preference for dads over cads because there are trade-offs between a mate's genetic fitness and his willingness to help in child-rearing (Gangestad & Simpson, 2000). We found that older women prefer dads even for short-term relationships and brief sexual affairs, perhaps as a mean to develop a long-term relationship (Li & Kenrick, 2006).

As hypothesized, in comparison to younger women, older women identified themselves more as a dad than as a cad. Older women, therefore, portray traits that reflect a greater emphasis on parental investment and long-term, risk-averse strategies as compared to short-term mating effort and higher-risk strategies. McCrae et al. (2000) suggested that some age-related changes in personality might have an evolutionary basis because they facilitate raising a family. They showed that age-related changes in personality are similar over cultures, implying that they are intrinsic in nature and not so much a response to life events.

If indeed the age-related changes in female personality were selected for increasing reproductive effort, then women's self-reported resemblance to dads vs. cads would mediate the effect of age on mate preference. As expected, this was the common result. Once the path mediated by female personality was controlled for, age had a weak but significant direct effect on the preference for dads for long-term relationships and brief sexual affairs, and no significant effect on the preference for dads for short-term relationships. Thus, we can speculate that the terminal investment hypothesis effect is manifested through personality change. This age-related change in female personality increases the inclination to invest in her current offspring even through her choice of partner.

As expected, in comparison to younger women, older women were less inclined towards sexual affairs with either dads or cads. This reflects the shift in focus from short-term mating effort, which could result in father-absent offspring, to high parental investment. While a father's presence does not exert a large influence on child mortality, it may improve the offspring's chances of marrying well and successfully reproducing (Sear & Mace, 2008).

The present study has a number of limitations. First, it is based on a diverse sample from many countries. While this may improve generalizability, it has proved to be problematic since there were age differences between the sub-samples. Second,

female socio-economic status, which may affect mate choice, was not assessed. The study does have advantages such as the wide range of ages of the participants, which in the past has been restricted, and the cultural diversity.

The terminal investment hypothesis suggests that reproductive effort would increase with age. We found, accordingly, that older women choose mating strategies that are related with higher paternal investment. In addition, we found that a woman's self-description changes with age, mediating the age-related changes in mate preferences. We suggest that these changes serve the changing needs of an older woman and the transition from investing in future offspring to investment in the current offspring.

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