

Visually conspicuous vehicle modifications influence perceptions of male owner's reproductive strategy and attractiveness

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ABSTRACT

Resource displays are an important aspect of male mating effort. Males with relatively higher mating effort may invest proportionally more in economic display at the expense of savings and paternal investment. We predicted that aftermarket motor vehicle modifications would influence perceptions of male vehicle owners. Male owners of vehicles with upgraded wheels, compared to owners of vehicles with stock wheels, would be rated 1a) higher on mating effort, 1b) lower on parental investment, 2a) higher in interest for brief sexual affairs, 2b) lower in interest for long-term committed romantic relationships, 3a) higher in attractiveness to women for brief sexual affairs, and 3b) lower in attractiveness to women for long-term committed romantic relationships. We used before and after modification images of a Jeep Rubicon and Chrysler 300. Results for ratings of Jeep owners supported all hypotheses, but only for male participants. Results for ratings of Chrysler 300 owners supported hypotheses regarding life history dimensions (1a and 1b) and attractiveness to women (3a and 3b) for all participants. Results for ratings of Chrysler 300 owners' relationship interest (2a and 2b) fit the predicted pattern for the upgraded vehicle, but not in comparisons with the stock vehicle.

KEYWORDS

Conspicuous consumption, costly signaling, life history, mating strategy, automobile

Charles Darwin considered costly traits that could not be accounted for by survival advantage, such as peacock tails, problematic to his theory of evolution by natural selection. He later realized that these features conferred reproductive advantage in the acquisition of mating partners. Males who succeed in reproductive competitions have more offspring, and traits that facilitate reproductive success will

be selected for, even if such traits may also lead to other detrimental consequences (Darwin, 1871).

Social and economic status predicts male reproductive success across a wide variety of societies (Hopcroft, 2006). Even in relatively egalitarian foraging societies, higher status men have more mating opportunities (Chagnon, 1992; Hill & Hurtado, 1996). Across cultures, women evaluate socio-economic status in considerations of partner suitability more so than men (Buss, 1989). Veblen (1899/1953) noted the relationship between social prestige and the consumption of conspicuous consumer goods, and even suggested that inherited psychological mechanisms were responsible for this relationship.

Evolutionary Psychologists have proposed that human male displays of wealth are literally a costly signal analogue to the peacock's tail (Miller & Todd, 1998). Displays of expensive consumer goods could provide an honest signal of male mate value, demonstrating available resources as well as skills at acquiring wealth (Colarelli & Dettman, 2003). Amazonian foragers and slash-and-burn farmers with greater monetary resources allocated a greater portion of their expenditures towards luxury goods than others did, especially among men (Godoy et al., 2007). Advertisers try to associate a product with prestige even when there is no functional relationship (Colarelli & Dettman, 2003) and commercial marketing commonly conflates luxury goods with sexual access to attractive women (Reichert, 2002). Several laboratory studies have demonstrated that situational primes making mating effort salient can induce male intentions to increase economic power as well as allocate financial resources to conspicuous products (e.g., Griskevicius et al., 2007; Roney, 2003; Wilson & Daly, 2004). However, recent research has called these priming studies into question as products of publication bias and/or *p*-hacking (Shanks, Vadillo, Riedel, Clymo, Govind, Hickin, Tamman, & Puhmann, 2015).

Male resource displays can be considered as mating efforts in both inter-sexual attraction and intra-sexual competition (Buss, 1988). Thus, both men and women are likely to assess male resource displays as an indicator of potential mate value and relative competitiveness in the mating market. Proportional investments in conspicuous resource displays may be related to variance in life history strategy. Those developing in relatively unpredictable environments are expected to develop riskier behavioral strategies to take advantage of possibly fleeting opportunities (Chisholm, 1999; Roff, 1992; Stearns, 1992), which may include both riskier financial strategies and tendencies towards short-term mating. Men higher in mating effort may maximize their economic displays, saving little and even spending beyond their actual capacity through the use of credit. Men with greater financial discounting in real-life asset management indeed have higher mating success (Kruger, 2008).

The standard evolutionary psychology reasoning accounting for human male tendencies for wealth display of based on the assumption that such displays signal potential investment in partners and offspring (e.g., Buss, 1989). Paternal investment in offspring may enhance offspring reproductive success (Geary, 2005); children who grow up without a father present suffer higher mortality rates in foraging societies (Hill & Hurtado, 1996). Although male wealth and conspicuous resource signals do likely predict paternal investment in many contexts, this is not necessarily universal. In some cases, especially among men with relatively faster

life histories, presumably costly financial displays may be purely mating effort. Such goods will not actually be converted into resources for partners or mutual offspring, and some of the men making these costly financial displays may actually invest proportionally fewer resources to meet the practical needs of and increase general quality of life for their family compared to their peers. Thus, in some contexts, conspicuous displays of luxury goods may indicate higher mating effort and interest in short-term sexual relationships, rather than potential parental investment and interest in long-term committed romantic relationships.

Conspicuous displays of luxury goods can come in many forms, from expensive and flashy watches to large chrome car wheels. Larger and more visually conspicuous vehicle wheels may function akin to signals of phenotypic quality, and thus attributions and mating preferences related to these features may be more consistent with attributions and mating preferences based on genetic investment rather than resource investment (see Kruger, 2006). We expect that Midwestern American college students will intuitively understand this pattern in the domain of aftermarket motor vehicle modifications. Men who invest in flashy vehicle displays will be seen as having a relatively faster life history strategy, with higher mating effort and lower parental investment, and greater interest in (and attraction for) briefer sexual relationships.

HYPOTHESES

Male owners of vehicles with upgraded aftermarket wheels, compared to owners of vehicles with stock wheels, will be rated:

1. Life History Strategy:
 - a) Higher on mating effort
 - b) Lower on parental investment
2. Interest in relationships:
 - a) Higher for brief sexual affairs
 - b) Lower for long-term committed romantic relationships
3. Attractiveness to women:
 - a) Higher for brief sexual affairs
 - b) Lower for long-term committed romantic relationships

Thus, we predict interactions between vehicle type (stock vs. upgraded wheels) and each type of dependent measure: Life History Strategy (mating effort vs. parental investment), and length of relationship for both presumed male owner's interest in relationships and his estimated attractiveness to women.

METHODS

Participants

Ethnically diverse undergraduates at a large public university in the Midwestern USA ($N = 339$, 53% female, M age = 19, SD age = 1) completed

anonymous on-line surveys at their convenience. Participants were asked to complete the survey in a private setting.

Procedure

We conducted searches in Google Images using the search terms “new rims,” “before,” and “after.” Images were selected based on the following criteria: 1) A high-resolution color picture with no visual alterations, 2) Depicting the side of the vehicle, 3) One image with upgraded (larger, shinier) aftermarket wheels, one with more basic or stock wheels, 4) No people or other vehicles visible. The first two sets of pictures viewed that matched all four of these criteria were selected. These images were of a blue Jeep Rubicon and a black Chrysler 300. Images were cropped to remove background and resized to maximize similarity.

Each participant viewed one Jeep and one Chrysler 300 image on separate survey pages, conditions and order of images were completely randomized based on participant's birth month. For each image, participants rated the presumed male owner of the vehicle on a 0-100 sliding scale, initially set at 50. When respondents clicked on the scale, a value would be displayed. Participants could re-click each scale until they chose to advance the survey page.

First, participants rated the owner on eight characteristics related to Life History Strategy, presented in a randomized order. Four items represented Mating Effort (e.g., “Knowingly hits on someone else’s partner”), four items represented Parental Investment (e.g., “Good at taking care of children”). This was followed by two sets of relationship items, “How interested would this man be in...” and “How attractive would women think this man is for...” Each question stem included the items: “A long-term committed romantic relationship,” “A two-month romantic relationship,” and “A brief sexual affair.” Participants also rated these items on a 0-100 sliding scale, initially set at 50.

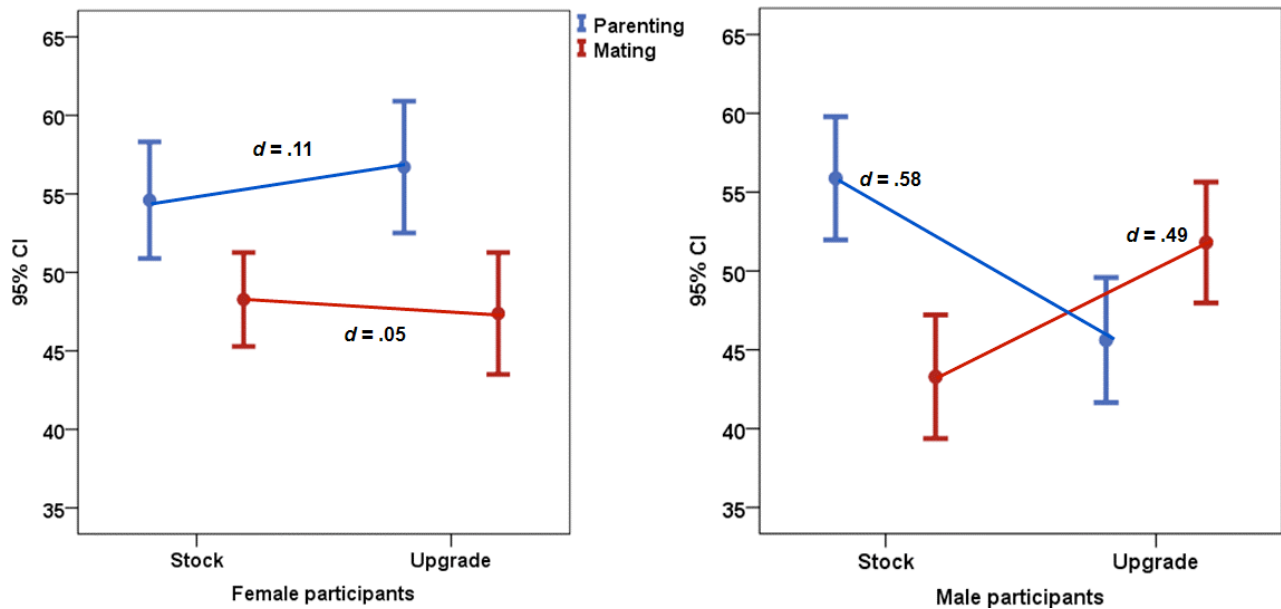
We ran Analyses of Variance (ANOVAs) for mixed designs for ratings of each vehicle: 2 (participant sex) x 2 vehicle type (stock vs. upgraded wheels) x 2 Life History Strategy (mating effort vs. parental investment); 2 (participant sex) x 2 vehicle type (stock vs. upgraded wheels) x 3 interest in relationships (length of relationship); and 2 (participant sex) x 2 vehicle type (stock vs. upgraded wheels) x 3 attractiveness to women (length of relationship). We followed these ANOVAs with simple effects analyses when omnibus tests identified significant interactions affecting the interpretation of results related to hypotheses. Effect sizes were calculated for comparisons related to hypotheses, *ds* of .20, .50, and .80 respectively represent small, medium, and large effect sizes (Cohen, 1988).

RESULTS

Cronbach Alphas for the Life History dimension scales ranged from .786 to .880. There was a three-way interaction between participant sex, vehicle type, and Life History dimension for ratings of the Jeep owner, $F(1,335) = 12.77, p < .001$, an

interaction between vehicle type and Life History dimension, $F(1,335) = 6.70$, $p = .010$, a main effect for participant sex, $F(1,335) = 4.97$, $p = .026$, and a main effect for Life History Strategy, $F(1,335) = 11.73$, $p < .001$. Simple effects analyses determined that the interaction between vehicle type and Life History dimension was significant for male participants, $F(1,159) = 15.77$, $p < .001$, but not for female participants (see Figure 1). Consistent with Hypotheses 1a and 1b, men rated the owner of the upgraded Jeep higher in mating effort and lower in parental investment compared to the owner of the stock Jeep.

Figure 1. Life history dimension ratings of Jeep owners by participant sex.



For ratings of Jeep owners' relationship interests, there was a three-way interaction between participant sex, vehicle type, and length of relationship, $F(2,670) = 3.61$, $p = .028$, an interaction between participant sex and length of relationship, $F(2,670) = 4.62$, $p = .010$, a main effect for participant sex, $F(1,670) = 4.25$, $p = .040$, and a main effect for length of relationship, $F(2,670) = 21.94$, $p < .001$. Simple effects analyses determined that the interaction between vehicle type and length of relationship was significant for male participants, $F(1,318) = 3.63$, $p = .028$, but not for female participants. Consistent with Hypotheses 2a and 2b, men rated the owner of the upgraded Jeep higher in higher for interest in brief sexual affairs and lower for interest in long-term committed romantic relationships, compared to the owner of the stock vehicle (see Figure 2). For ratings of Jeep owners' attractiveness to women, there was a three-way interaction between participant sex, vehicle type, and length of relationship, $F(2,670) = 3.66$, $p = .026$, an interaction between participant sex and length of relationship, $F(2,670) = 3.23$, $p = .040$, a main effect for participant sex, $F(1,670) = 14.35$, $p < .001$, and a main effect for length of relationship, $F(2,670) = 8.88$, $p < .001$. Simple effects analyses determined that the interaction between

vehicle type and length of relationship was significant for male participants, $F(1,318) = 3.56, p = .030$, but not for female participants. Consistent with Hypotheses 3a and 3b, men rated the owner of the upgraded Jeep higher in attractiveness to women for brief sexual affairs and lower for long-term committed romantic relationships, compared to the owner of the stock vehicle (see Figure 2).

Figure 2. How interested would this man be in x (for Jeep).

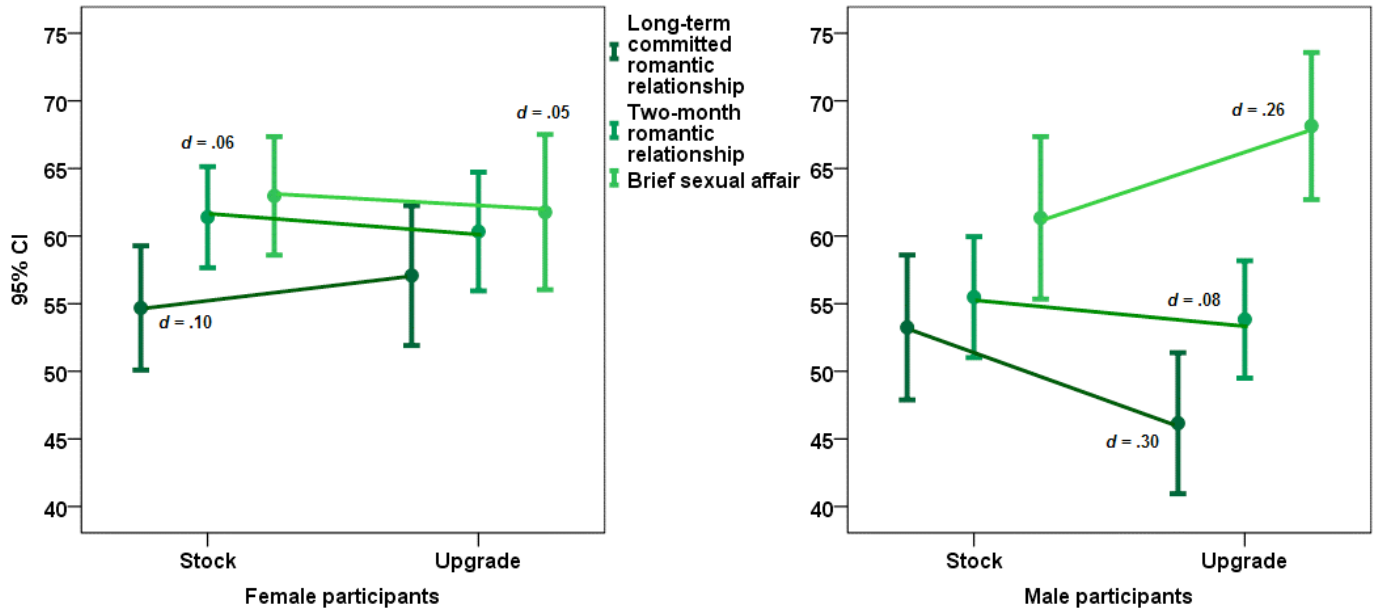
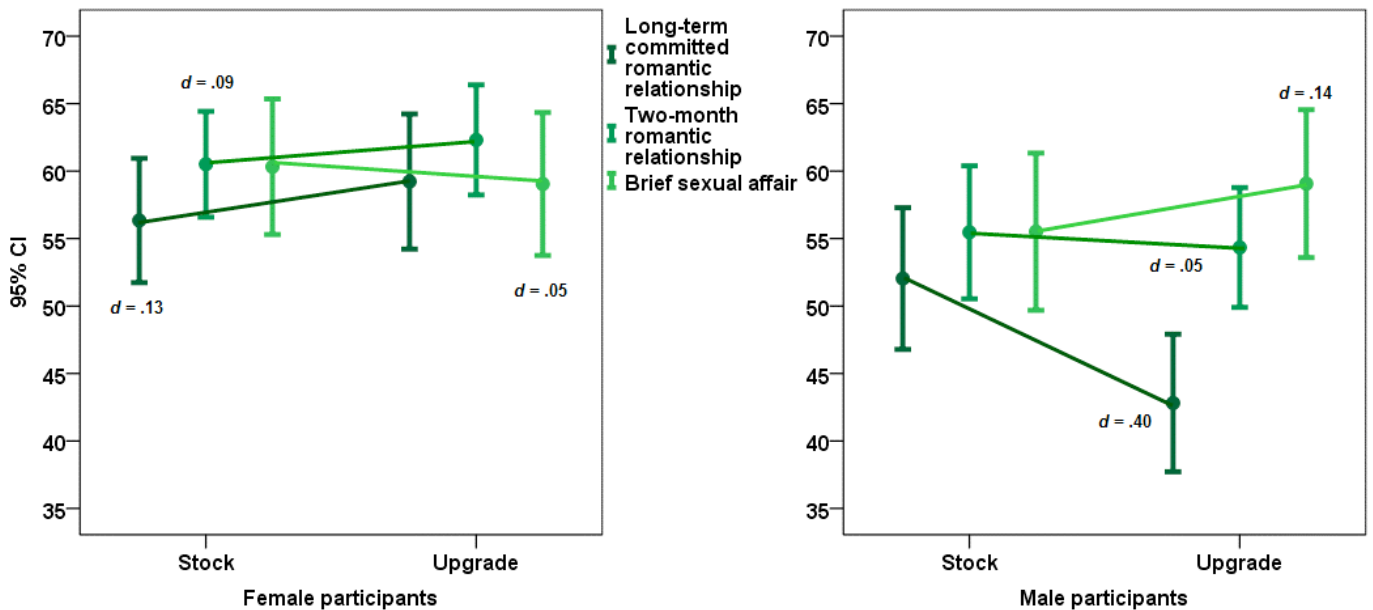
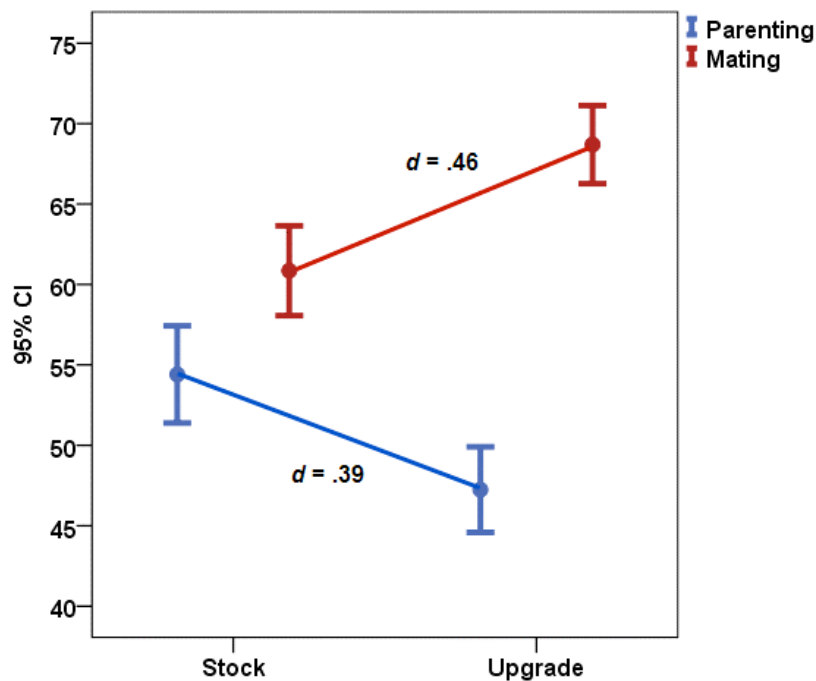


Figure 3. How attractive would women think this man is for x (for Jeep).



For ratings of the Chrysler 300 owners' Life History, there was a main effect for Life History dimension, $F(1,335) = 78.66, p < .001$, a main effect for participant sex, $F(1,335) = 5.47, p = .020$, and an interaction between vehicle type and Life History dimension, $F(1,335) = 22.69, p < .001$. Supporting Hypotheses 1a and 1b, participants rated the owner of the upgraded Chrysler 300 higher in mating effort and lower in parental investment compared to the owner of the stock Chrysler 300 (see Figure 4). Participants rated owners of both Chrysler 300s higher in mating effort than in parental investment, women tended to give higher ratings overall.

Figure 4. Life history dimension ratings of Chrysler 300 owners.



For ratings of Chrysler 300 owners' relationship interests, there was a main effect for length of relationship, $F(2,594) = 19.36, p < .001$, and an interaction between length of relationship and vehicle type, $F(2,594) = 9.85, p < .001$. The owner of the upgraded vehicle was rated higher for interest in all types of relationships, though the expected pattern of interests was seen for the upgraded vehicle, where relationship interest was inversely related to relationship length (see Figure 5). For ratings of attractiveness to women, there was a main effect for length of relationship, $F(2,670) = 16.08, p < .001$, a main effect of participant sex, $F(1,670) = 7.05, p = .008$, and an interaction between length of relationship and vehicle type, $F(2,670) = 12.36, p < .001$. Supporting Hypotheses 3a and 3b, the owner of the upgraded vehicle was rated higher in attractiveness to women for brief sexual affairs and lower in interest for long-term committed romantic relationships, compared to

the owner of the stock vehicle (see Figure 6). Women gave higher ratings of attractiveness overall. Perceived attractiveness to women was inversely related to the length of the relationship, though this effect appeared to be primarily driven by the upgraded vehicle.

Figure 5. How interested would this man be in x (for Chrysler 300).

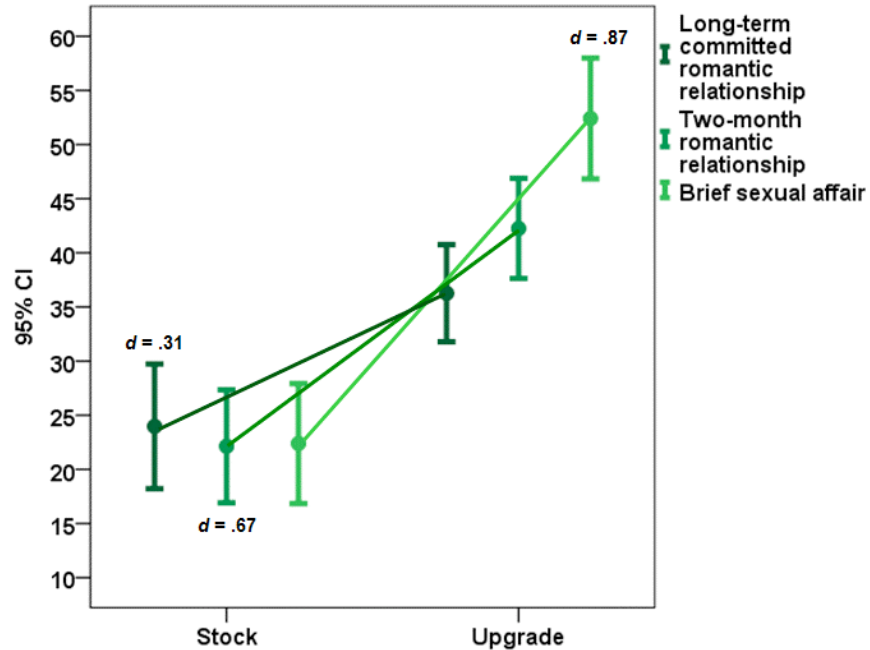
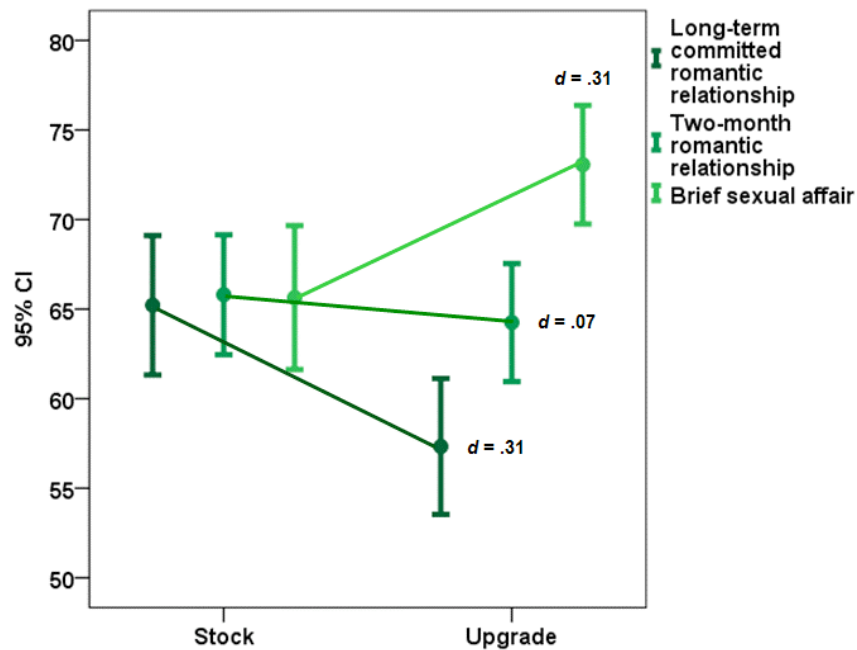


Figure 6. How attractive would women think this man is for x (Chrysler 300).



DISCUSSION

Our hypotheses were generally supported, though not every prediction was consistently confirmed, and the pattern of results provided stronger support for ratings by men than ratings by women. Male participants exhibited the expected pattern of ratings for images of the Jeep; however no support for hypotheses was seen in ratings for Jeep images by female participants. Ratings based on Chrysler 300 images did not differ by participant sex, and supported predictions for life history dimensions and male owner's attractiveness to women, but not for male owner's interest in relationships. Male owners of upgraded Chrysler 300s were seen as more interested in romantic and sexual relationships than owners of stock Chrysler 300s regardless of length, though their degree of interest was rated higher for brief sexual affairs than for long-term committed romantic relationships.

The stronger pattern of effects for male participants could in part be explained by greater average male interest in and knowledge about automobiles. Sex differences in automobile interest have been documented since the early age of automobiles (e.g., Benjamin, 1932). Even academics believing that sex differences are products purely of socially constructed norms recognize the strong associations between car culture and masculinity, and the dramatic sex differences in rates of automobile accidents (e.g., Walker, Butland, & Connell, 2000). Men may be more likely to recognize the attributes of, and the difference between, stock and aftermarket wheels, and thus they may have a better understanding of the interests and behavioral tendencies associated with each. Men may also be savvier in their understanding of male tactics used in mating competition.

Both women and men derogate their mating competitors, and men are particularly likely to derogate the resource potential of other men who are potential competitors (Buss & Dedden, 1990). Individuals may be especially likely to call out competitors who they identify as utilizing false signals, - i.e., empty promises of financial investment. Thus, men may be more sensitive to the financial and mating strategies of potential competitors, which could help explain why the pattern of effects was more consistent with predictions for male participants than for female participants.

We observed a stronger pattern of effects for Chrysler 300 images than for Jeep Rubicon images. The Jeep originated as a durable military vehicle and the current product line of sport utility vehicles and off-road vehicles reflects this rugged heritage. Jeeps are built to have more ground clearance than a typical sedan, which is essential for its original designed purpose for off-roading or traversing difficult terrain. Mounting large aftermarket wheels on a Jeep, as seen in the upgraded image, reduces the ground clearance and width of tire. This interferes with the Jeep's designed functionality, and the mismatch may appear strange or silly, as it is impractical. We also note that owners of the Chrysler 300 were rated relatively high in mating effort regardless of wheel type, a pattern seen in combination with the predicted effects. The aggressive looking car body, likely meant to appeal to younger and urban drivers, may contribute to this perception. Using a more average and typical looking sedan as the baseline stimuli may produce a cleaner pattern of effects. The authors literally searched through hundreds of automobile images to find just these two sets of suitable stimuli.

We demonstrate empirical evidence for our hypotheses derived from evolutionary theory, as well as advance evolutionary theory related to human male mating strategies. The current explanation for why male resource displays are attractive to women is that they indicate investment potential for the relationship and resulting offspring (e.g., Buss, 1989). Although this is true in many cases, we believe that for some men (especially men with relatively fast life histories), these displays function more so as indicators of phenotypical quality than potential paternal investment in offspring. We believe that our study provides the first empirical evidence for this hypothesis, as our participants demonstrated an understanding of these resource allocation patterns. Across analyses, male owners of vehicles with upgraded aftermarket wheels were judged higher in mating effort, lower in parental investment, and more interested in brief sexual relationships than long-term committed romantic relationships. Notably, the parental investment scale contains the item, "uses most of his money to support his family." The scale demonstrated high inter-item reliability and deleting this item would decrease inter-item reliability for ratings of both the Jeep and Chrysler 300.

Limitations

Limitations include the use of a North American university participant pool and found images on the Internet. Psychological research has been criticized for its reliance on "Western, Educated, Industrialized, Rich, and Democratic" participants (Henrich, Heine, & Norenzayan, 2010) as well as predominant use of undergraduate research participants, which may have truncated ranges in important relevant

attributes. We believe that the age range of our participants is suitable to test our experimental hypotheses, at least much more so than for a domain such as experiences with childcare. However, this student population is generally very affluent (75% of this university's undergraduates are from households with annual incomes over \$125,000 USD, whereas the median household income in the state is \$44,627). Thus, expensive vehicles and costly aftermarket modifications seen in the campus area may be more representative of parental wealth than of the driver's own financial strategies. Extravagant car wheels may also be seen as gauche in a population that is generally politically progressive and though generally affluent, also wary of ostentatious displays.

Future Research

As this is the first study of its kind, the lessons we have learned will enhance future research efforts. Using a more average and typical looking sedan as the baseline stimuli may produce a cleaner pattern of effects. The authors literally searched through hundreds of automobile images to find just these two sets of suitable stimuli. Individuals who actually did purchase extravagant aftermarket wheels owned these vehicles, so there is a trade-off between realism and extremity of baseline stimuli. Using a more diverse participant sample or one from a population where aftermarket vehicle modifications are common, may also strengthen the results and support for our hypotheses.

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