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# It's Complicated: Why Raters' BMI Poorly Explained Attractiveness Ratings

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In this issue of *Obesity*, Wang and colleagues (1) are interested in understanding how assortative mating may contribute to obesity and variation in adiposity. To this end, they test the hypothesis that adults are more likely to be attracted to others with similar levels of adiposity through self-reported BMI of ~900 adults and their ratings of opposite sex attractiveness from dual-energy x-ray absorptiometry (DXA) soft body images. Ultimately, their data did not support this “mutual attraction” hypothesis, with the exception of white men.

For much of human evolution, higher fat contents represented critical energy stores that could be used for reproduction and fighting off infections. However, the stigma surrounding obesity has increased recently in Western populations and in populations that traditionally viewed fat positively (2,3). These body norms and pressures are stronger for women than men and are reflected in ratings of attractiveness and other characteristics (3). Overall, Wang et al. (1) found that men across 12 populations rated women of lower adiposity as more attractive. Women had a slightly left skewed and inverted U-shaped relationship between attractiveness and men's adiposity; men with low to medium (~12%-14%) body fat were rated most attractive. Wang et al.'s statistical approach allowed for emergent patterns in preferences by adding higher-order polynomials and extracting how many raters conformed to those patterns, then testing the differences in raters' BMI by those patterns. There were significant differences in the proportion of type patterns by populations for men and women, indicating no universal preference for a certain level of adiposity.

In sum, raters' BMI poorly predicted body fat preferences, leaving the mechanisms underlying assortative mating for adiposity unexplained. As an alternative to the unsupported “mutual attraction” hypothesis, Wang et al. invoke “attractiveness matching,” in which people with desirable body shapes are more likely to see their preferences realized. To this plausible explanation, we add two suggestions.

First, alternative measurement techniques may reveal clearer relationships between one's own adiposity and preferences for adiposity. Using self-reported BMI masks body composition differences such as muscularity, and hence, future studies might directly measure raters' body fat. Likewise, alternative approaches to measuring adiposity preferences are possible. For instance, DXA scans may have low ecological validity as stimuli for assessing mate preferences

relative to photographs or videos. Furthermore, many multisensory factors play a role in the perception of attractiveness (4,5). Though Wang and colleagues do a good job of isolating adiposity with DXA scans, adiposity also predicts facial and vocal attractiveness (5). Perhaps measuring adiposity preferences across traits and sensory modalities would reveal a clearer relationship with raters' own adiposity. Moreover, in quantifying preferences, while the shape of relationships between stimulus properties and behavioral responses is important, so is the strength of these relationships (e.g., correlation coefficients) (6) and potential heterogeneity by adiposity level. Finally, it may be useful to examine what adiposity level (or range) people would be willing to accept in a mate to test attractiveness matching (7).

Second, theoretical reasons exist to expect that rater BMI might not linearly predict adiposity preferences. Given that men with medium to low adiposity were most preferred, their advantage may allow them to be choosier. If so, then the relationship between men's adiposity and their adiposity preferences may be negatively quadratic. Additionally, attractiveness may not be the only, or most important, predictor of mating opportunities, especially for men (8). Social status and dominance may afford opportunities to initiate and retain romantic relationships independently of attractiveness, for example, by deterring interlopers. If people with lower adiposity have higher social status, then they may retain leaner, more desirable mates despite preferences and independently of their own attractiveness.

The study by Wang and colleagues incorporated adults from 12 countries representing white, African, and Asian populations. More cross-cultural samples are needed in testing these hypotheses, as studies often rely on Western, educated, industrialized, rich, and democratic populations. While globalization has increasingly created a shared culture regarding body image (2), preferences are influenced by culture and the social and physical environment that people experience. When trying to explain human preferences such as physical attraction, one level of causation is often inadequate, as demonstrated here. Finally, a rating of attractiveness does not mean the sentiment would be reciprocated, which is what could ultimately increase one's evolutionary fitness. ○

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See accompanying article, pg. 522.

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