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Graphing Jane Austen

Agonistic structure in British novels of the nineteenth century

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Building on findings in evolutionary psychology, we constructed a model of human nature and used it to illuminate the evolved psychology that shapes the organization of characters in nineteenth-century British novels. Characters were rated on the web by 519 scholars and students of Victorian literature. Rated categories include motives, criteria for selecting marital partners, personality traits, and the emotional responses of readers. Respondents assigned characters to roles as protagonists, antagonists, or associates of protagonists or antagonists. We conclude that protagonists and their associates form communities of cooperative endeavor. Antagonists exemplify dominance behavior that threatens community cohesion. We summarize results from the whole body of novels and use them to identify distinctive features in the novels of Jane Austen.

The research described in this study is designed to help bridge the gap between science and literary scholarship. Building on findings in evolutionary psychology, we constructed a model of human nature and used it to illuminate the evolved psychology that shapes the organization of characters in nineteenth-century British novels (Austen to Forster). Using categories from the model, we created a web-based survey and induced hundreds of readers to give numerical ratings to the attributes of hundreds of characters. Participants also rated their own emotional responses to the characters. Our broadest goal was to bring the analysis of character and emotional response within the range of quantifiable information from psychological concepts rooted in an evolutionary understanding of human nature. A more specific goal was to identify the values implicit in the “agonistic structure” of the novels. By comparing features that distinguish protagonists and their

associates from antagonists and their associates, and especially protagonists from antagonists, we sought to infer the values that authors invested in their characters and anticipated that their readers would share. We hypothesized that on the average protagonists, in their motives and personality traits, would reflect values the authors approve and that they expect their readers to approve. Antagonists would reflect values authors and their readers do not approve. Approval and disapproval would be registered in the emotional responses of our respondents.

This study produced an especially large abundance of data on characters in the novels of Jane Austen. The averages produced by characters in the study as a whole provide a base line against which we can identify the distinctive features of characters in Austen's novels. In this article, we first describe the study as a whole and then turn our attention to Austen.

Method

Procedures

The questionnaire contained an average of ten characters each from 202 novels. We have placed a copy of the questionnaire on a single page so that our readers can see what the questionnaire looked like: <http://www-personal.umich.edu/~kruger/carroll-survey.html>. (The form is no longer active and will not be used to collect data.) The questionnaire contains a link to a page in which we explain our rationale for the selection of novels: <http://www-personal.umich.edu/~kruger/carroll-principles.html>. In brief, the 202 novels in this study were selected on the basis of three criteria: contemporary popularity and esteem, influence on other writers, and lasting critical reputation.

Respondents were asked to select specific characters and to give numerical ratings to characters on motives, criteria for selecting mates, personality factors, and their own emotional responses. (On the sample copy available through the web address given in the previous paragraph, in order to provide a character thread for the questions, we selected a character, Emma from Jane Austen's *Emma*, from the list of possible selections.) Categories receiving numerical ratings included twelve motives, seven criteria for selecting mates, five personality factors, and eleven emotional responses. Respondents also assigned characters to one of four possible roles: protagonist, friend or associate of a protagonist, antagonist, or friend and associate of an antagonist. (Alternatively, respondents could check "other" and thus decline to assign characters to roles.) And finally respondents were asked to say whether they wished the character to succeed in his or her hopes and efforts, whether the character had in fact succeeded, and whether the character's success

was or was not a main feature in the outcome of the story. Respondents were solicited by direct mail to faculty in English departments world-wide and through listservs dedicated to Victorian novels. Respondents selected a character from the list and answered a series of questions about that character. Approximately 519 respondents completed a total of 1,470 protocols on 435 separate characters from 144 novels. (Further details on the demographics of the respondents and on our statistical methods can be found in two previously published articles: Johnson, Carroll, Gottschall, & Kruger, 2008, 2011).

For characters who received multiple codings, the averaged scores for each such character are counted only once in the total set of scores. For instance, Elizabeth Bennett from Jane Austen's *Pride and Prejudice* was coded by 81 respondents. On each category, the scores of all respondents were averaged, and that average score is counted only once in the total data set. When multiple readers did not agree on role assignments, we assigned characters to the role designated by the majority of the respondents

The scores on motives, the criteria for selecting mates, and emotional responses produced data that we condensed into smaller sets of categories through factor analysis. The five personality domains represent a condensation of traits from six decades of factor analytic studies (Barenbaum & Winter, 2008; John & Srivastava, 1999). In this article, further condensing the results, we compare only protagonists and antagonists, and we display the results only for motives, long-term mating, personality, and emotional responses. These results bring out the main tendencies in the data. (A recently published book *Graphing Jane Austen: The Evolutionary Basis of Literary Meaning*, contains details omitted here.)

Main categories on which characters were rated

Motives. Life history theory provides a framework for the goals that characterize human nature (H. Kaplan, Gurven, & Winking, 2009; H. S. Kaplan & Gangestad, 2005; Low, 2000; K. MacDonald, 1997). All species have a "life history," a species-typical pattern for birth, growth, reproduction, social relations (if the species is social), and death. For each species, the pattern of life history forms a reproductive cycle. In the case of humans, that cycle centers on parents, children, and the social group. Successful parental care produces children capable, when grown, of forming adult pair bonds, becoming functioning members of a community, and caring for children of their own. "Human nature" is the set of species-typical characteristics regulated by the human reproductive cycle.

For the purposes of this study, we divided human life history into a set of 12 basic motives — that is, goal-oriented behaviors regulated by the reproductive cycle. For survival, we included two motives — survival itself (fending off

immediate threats to life), and performing routine work to earn a living. We also asked about the importance of acquiring wealth, power, and prestige, and about the importance of acquiring a mate in both the short term and the long term. In the context of these novels, short-term mate selection would mean flirtation or illicit sexual activity; long-term mate selection would mean seeking a marital partner. Taking account of “reproduction” in its wider significance of replicating genes one shares with kin (“inclusive fitness”), we asked about the importance of helping offspring and other kin. For motives oriented to positive social relations beyond one’s own kin, we included a question on “acquiring friends and making alliances” and another on “helping non-kin.” And finally, to capture the uniquely human dispositions for acquiring complex forms of culture, we included “seeking education or culture” and “building, creating, or discovering something.”

We predicted that protagonists would be more affiliative and interested in education and culture. We believed that antagonists would be chiefly concerned with acquiring wealth, power, and prestige.

Preferred characteristics in a mate. Evolutionary psychologists have identified mating preferences that males and females share and also preferences that differ by sex. Males and females both value kindness, intelligence, and reliability in mates. Males preferentially value physical attractiveness, and females preferentially value wealth, prestige, and power. These sex-specific preferences are rooted in the logic of reproduction and have become part of human nature because they had adaptive value in ancestral environments. Physical attractiveness in females correlates with youth and health — hence with reproductive potential. Wealth, power, and prestige enable a male to provide for a mate and her offspring (D. M. Buss, 2003; Gangestad, 2007; Geary, 1998; Kruger, Fisher, & Jobling, 2003). We anticipated that scores for mate selection would correspond to the differences between males and females found in studies of mate selection in the real world. Since protagonists typically evoke admiration and liking in readers, we anticipated that protagonists would give stronger preference than antagonists to intelligence, kindness, and reliability. We reasoned that a preference for admirable qualities in a mate would evoke admiration in readers.

Personality. The standard model for personality is the five-factor or “big five” model. *Extraversion* signals assertive, exuberant activity in the social world versus a tendency to be quiet, withdrawn and disengaged. *Agreeableness* signals a pleasant, friendly disposition and tendency to cooperate and compromise, versus a tendency to be self-centered and inconsiderate. *Conscientiousness* refers to an inclination toward purposeful planning, organization, persistence, and reliability, versus impulsivity, aimlessness, laziness, and undependability. *Emotional Stability* reflects a temperament that is calm and relatively free from negative feelings, versus a temperament marked by extreme emotional reactivity and persistent anxiety, anger, or

depression. *Openness to Experience* describes a dimension of personality that distinguishes open (imaginative, intellectual, creative, complex) people from *closed* (down-to-earth, uncouth, conventional, simple) people (Costa & McCrae, 1997; Gosling, Rentfrow, & Swann, 2003; John, Angleitner, & Ostendorf, 1988; Johnson & Ostendorf, 1993; Nettle, 2007; Saucier, Georgiades, Tsaousis, & Goldberg, 2005).

We predicted that (a) protagonists and their friends would on average score higher on the personality factor Agreeableness, a measure of warmth and affiliation; and (b) that protagonists would score higher than antagonists on Openness to Experience, a measure of intellectual vivacity.

Emotions evoked in the reader. One of our working assumptions is that when readers respond to characters in novels, they respond in much the same way, emotionally, as they respond to people in everyday life (Bower & Morrow, 1990; Grabes, 2004; Oatley, 1999; Tan, 2000). They like or dislike them, admire them or despise them, fear them, feel sorry for them, or are amused by them. In writing fabricated accounts of human behavior, novelists select and organize their material for the purpose of generating such responses, and readers willingly cooperate with this purpose. They participate vicariously in the experiences depicted and form personal opinions about the qualities of the characters. Authors and readers thus collaborate in producing a simulated experience of emotionally responsive evaluative judgment (N. Carroll, 1997; Hogan, 2003; McEwan, 2005; Oatley & Gholamain, 1997; Storey, 1996; Van Peer, 1997). If agonistic structure in the novels reflects the evolved dispositions for forming cooperative social groups, the novels would provide a medium of shared imaginative experience through which authors and readers affirm and reinforce coalitional dispositions on a large cultural scale.

We sought to identify emotions that are universal and that are thus likely to be grounded in universal, evolved features of human psychology. The solution was to use Paul Ekman's influential set of seven basic or universal emotions: anger, fear, disgust, contempt, sadness, joy, and surprise (Ekman, 1999, 2007; Plutchik, 2003). These terms were adapted for the purpose of registering graded responses specifically to persons or characters. Four of the seven terms were used unaltered: anger, disgust, contempt, and sadness. Fear was divided into two distinct items: fear *of* a character, and fear *for* a character. "Joy" or "enjoyment" was adapted both to make it idiomatically appropriate as a response to a person and also to have it register some distinct qualitative differences. Two terms, "liking" and "admiration," served these purposes. "Surprise," like "joy," seems more appropriate as a descriptor for a response to a situation than as a descriptor for a response to a person or character. Consequently, we did not use the word "surprise." We did wish to have readers register a sense of oddity in characters, and we also wanted a wider array of positive responses to characters. We settled on the word "amusement," which combines the idea of oddity in characters with an idea of positive emotion. Using this term,

we aimed at capturing the kind of sensation Elizabeth Bennet describes, in *Pride and Prejudice*, when she is discussing the limits of satire with Darcy. “Follies and nonsense, whims and inconsistencies, *do* divert me, I own, and I laugh at them whenever I can” (Austen, 2001, p. 39). One further term was included in the list of possible emotional responses: indifference. Indifference is the flip side of “interest,” the otherwise undifferentiated sense that something matters, that it is important and worthy of attention.⁸

We predicted (a) that protagonists would receive high scores on the positive emotional responses “liking” and “admiration”; (b) that antagonists would receive high scores on the negative emotions “anger,” “disgust,” “contempt,” and “fear-of” the character; (c) that protagonists would score higher on “sadness” and “fear-for” the character than antagonists; and (d) that major characters (protagonists and antagonists) would score lower on “indifference” than minor characters.

Summary of predictions

We anticipated that protagonists would (a) score higher than antagonists in prosocial motives and in creativity and culture; (b) value kindness, intelligence, and reliability in mates; (c) score higher than antagonists in Agreeableness and Openness to Experience; and (d) evoke positive feelings in the reader. We predicted that antagonists would (a) score higher in a desire for wealth, power, and prestige; (b) place less emphasis on kindness, intelligence, and reliability in a mate; and (c) evoke negative feelings in the reader.

Results for the whole body of novels in the study

Motives

From 12 motives, factor analysis produced five motive factors: Social Dominance, Constructive Effort, Romance, Subsistence, and Nurture. Seeking wealth, power, and prestige all have strong positive loadings on Social Dominance, and helping non-kin has a moderate negative loading. (That is, helping non-kin correlates negatively with seeking wealth, power, and prestige.) Constructive Effort was defined most strongly by loadings from the two cultural motives, seeking education or culture, and creating, discovering, or building something, and also by loadings from two pro-social or affiliative motives: making friends and alliances and helping non-kin. Romance is a mating motive, chiefly loading on short-term and long-term mating. Subsistence combines two motives: survival, and performing routine tasks to gain a livelihood. Nurture is defined most heavily by loadings

from nurturing/fostering offspring or other kin, and that motive correlates negatively with short-term mating. Helping non-kin also contributes moderately to this factor, bringing affiliative kin-related behavior into association with generally affiliative social behavior.

Male and female protagonists both score higher than any other character set on Constructive Effort (see Figure 1). Male protagonist also score above average on Subsistence. Female protagonists score above average on Romance and Nurture. Male and female antagonists are characterized by an exclusive preoccupation with Social Dominance.

Preferred characteristics in a mate

A factor analysis produced three distinct factors: Extrinsic Attributes (a desire for wealth, power, and prestige in a mate), Intrinsic Qualities (a desire for kindness, reliability, and intelligence in a mate), and Physical Attractiveness (that one criterion by itself).

As predicted by evolutionary theory, female characters in general give a stronger preference to Extrinsic Attributes — wealth, power, and prestige — than male characters in general, but female antagonists exaggerate the female tendency toward preferring Extrinsic Attributes (see Figure 2). The emphasis female antagonists give to Extrinsic Attributes parallels their single-minded pursuit of Social

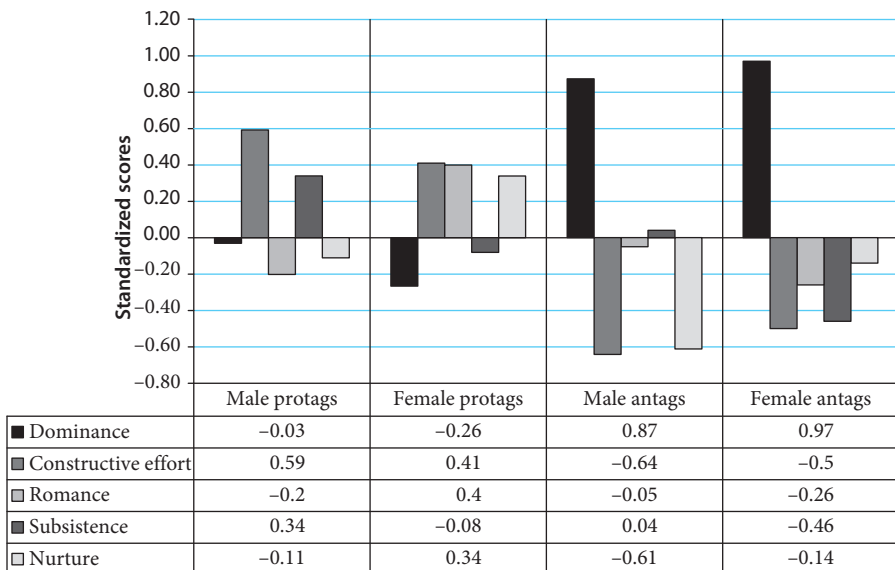


Figure 1. Motive factors in protagonists and antagonists

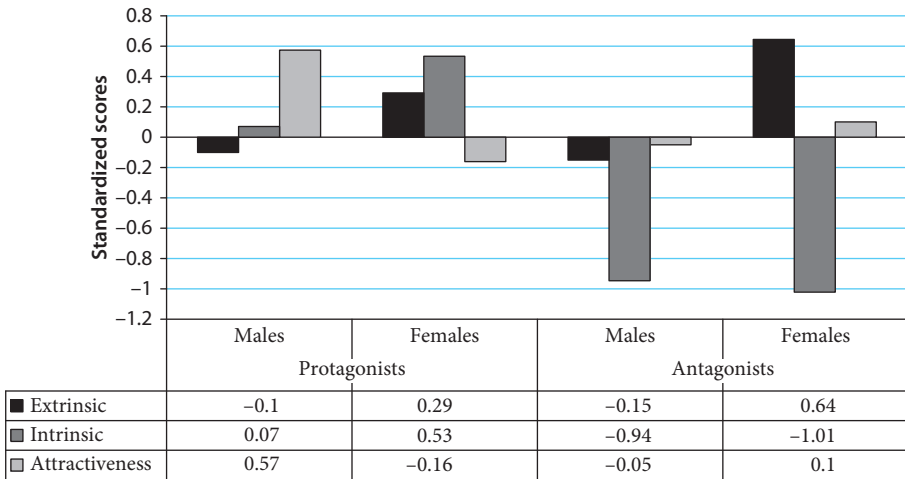


Figure 2. Criteria used by protagonists and antagonists in selecting marital partners

Dominance. Female protagonists give a more marked preference than male protagonists to Intrinsic Qualities — intelligence, kindness, and reliability.

We did not anticipate that male protagonists would be so strongly preoccupied with Physical Attractiveness relative to other qualities, nor did we anticipate that male antagonists would be so relatively indifferent to Physical Attractiveness. The inference we draw from these findings is that the male desire for physical beauty in mates is part of the ethos the novels. It is part of the charm and romance of the novels, part of the glamor. Male antagonists' relative indifference to Physical Attractiveness seems part of their general indifference to affiliative relationships.

Personality

Male and female protagonists are both somewhat introverted, agreeable, conscientious, emotionally stable, and open to experience (see Figure 3). Female protagonists score higher than any other set on Agreeableness, Conscientiousness, and Openness, and they score in the positive range on Stability. In personality, male protagonists look like slightly muted or moderated versions of female protagonists. Male and female antagonists are both relatively extraverted, highly disagreeable, and low in Stability and Openness. On each of the five factors, the protagonists and antagonists pair off and stand in contrast to one another.

The total profile for protagonists is that of quiet, steady people, curious and alert but not aggressive, friendly but not particularly outgoing. The antagonists, in contrast, are assertive, volatile, and unreliable, but also dull and conventional. Openness to Experience captures the intellectual and imaginative aspects of this

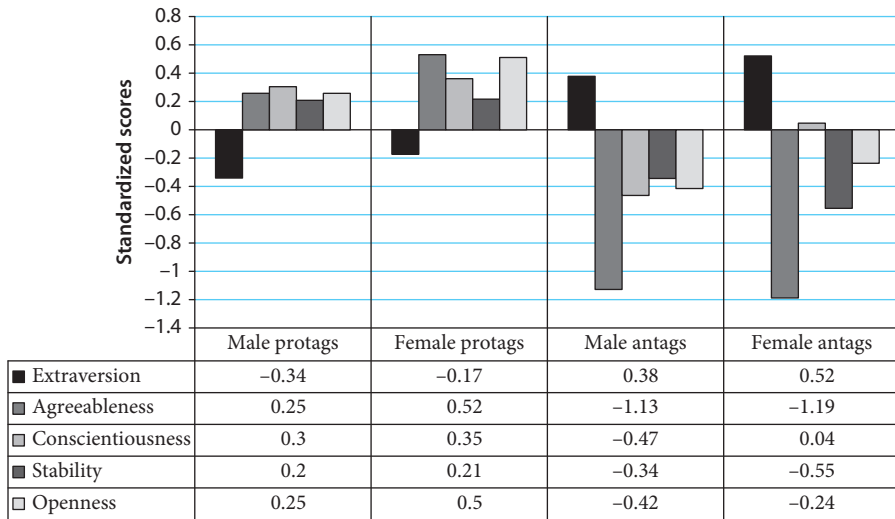


Figure 3. Personality factors in protagonists and antagonists

profile. Openness is associated with the desire for education or culture and with the desire to build, discover, or create, and that whole complex of cognitive features is one of the two basic elements in Constructive Effort.

Emotions evoked in the reader

Factor analysis produced three clearly defined emotional response factors: (a) Dislike, which includes anger, disgust, contempt, and fear *of* the character, and which also includes negative correlations with admiration and liking; (b) Sorrow, which includes sadness and fear *for* the character and a negative correlation with amusement; and (c) Interest, which consists chiefly in a negative correlation with indifference.

Male and female protagonists both score relatively low on Dislike and relatively high on Sorrow (see Figure 4). Male and female antagonists score very high on Dislike — higher than any other set — low on Sorrow, and somewhat above average on Interest. Female protagonists score high on Interest, but male protagonists score below average on Interest. They score lower even than good minor males, though not lower than the other minor characters.

The relatively low score received by male protagonists on Interest ran contrary to our expectation that protagonists, both male and female, would score lower on indifference than any other character set. We think this finding can be explained by the way agonistic polarization feeds into the psychology of cooperation. Male protagonists in our data set are relatively moderate, mild characters. They are introverted and agreeable, and they do not seek to dominate others socially. They are

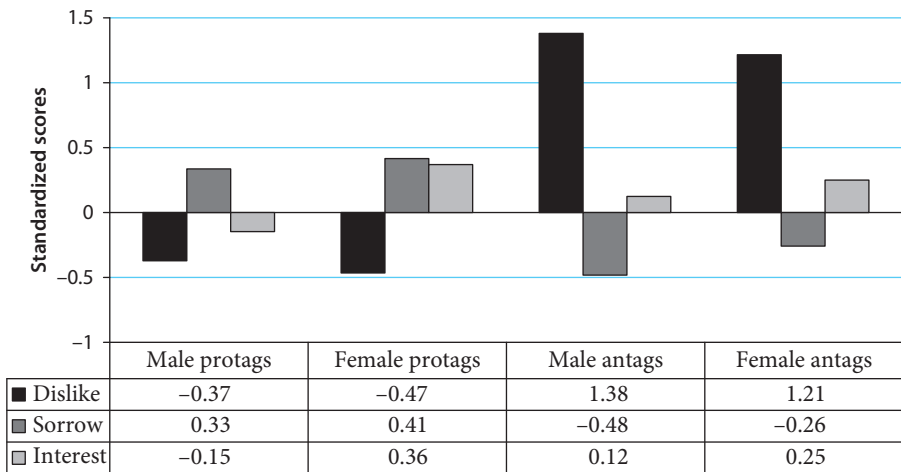


Figure 4. Emotional response factors for protagonists and antagonists

pleasant and conscientious, and they are also curious and alert. They are attractive, but they are not very assertive or aggressive. They excite very little Dislike at least in part because they do not excite much competitive antagonism. They are not intent on acquiring wealth and power, and they are thoroughly domesticated within the forms of conventional propriety. They serve admirably to exemplify normative values of cooperative behavior, but in serving this function they seem to be diminished in some vital component of fascination, some element of charisma. They lack power, and in lacking power, they seem also to lack some quality that excites intensity of interest in emotional response.

Discussion of results in the whole body of novels

Motives are the basis for action in human life. Selecting a sexual or marital partner drives reproductive success and evokes, accordingly, exceptionally strong feelings. Personality traits are dispositions to act on motives. Emotions are the proximal mechanisms that activate motives and guide our social judgments, including our judgments of imaginary people. These four categories take in a very broad swath of human experience, the depiction of characters in novels, and readers' responses to those depictions. If the agonistic patterns produced by the categories had been dim, feeble, and muddled, vague in outline and inconsistent in their relations to one another, that result would have strongly suggested that polarized relations between protagonists and antagonists does not account for much in the novels. As it turns out, though, the patterns are not vague and inconsistent. They are clear and robust.

A few characters are agonistically ambiguous. When multiple readers did not agree on role assignments, we assigned characters to the role designated by the majority of the respondents. Agonistically ambiguous characters like Catherine and Heathcliff in *Wuthering Heights* or Becky Sharp in *Vanity Fair* tend to be disagreeable or dangerous but adventurous and open minded, and readers tend to respond to them with antipathy but also with pity or grudging admiration. Agonistically ambiguous characters are extremely interesting, but their deviation from the norm does not subvert the larger pattern of agonistic structure. The larger pattern stands out clearly *despite* the blurring produced by the exceptions.

Borderline characters can be contrasted with characters who are clearly central or modal in their agonistic role assignments. For instance, the three most frequently coded characters are Elizabeth Bennet of Austen's *Pride and Prejudice*, Emma Woodhouse of Austen's *Emma*, and Jane Eyre of Charlotte Brontë's *Jane Eyre*. Eighty of 81 respondents identified Elizabeth as a protagonist; 72 of 74 identified Emma as a protagonist; and 66 of 68 identified Jane as a protagonist. (Simple clicking mistakes might account for the absence of complete unanimity in these assignments.)

Agonistic structure in these novels clearly serves as a central organizing principle. The characters display an integrated array of agonistically polarized attributes, and readers respond to those attributes in emotionally polarized ways. The antagonists display a single-minded preoccupation with wealth, prestige, and power — egoistic striving wholly segregated from social affiliations. That motive profile extends itself into their criteria for choosing mates. Male antagonists have no particular preferences in mates, and female antagonists seek only to marry for wealth and status. The sociopathic dispositions revealed in motives and mating correspond to low scores on the personality factor Agreeableness.

Antagonists are both emotionally isolated and also incurious. They are interested in nothing except enhancing their power and prestige. The protagonists, in contrast, care about friends and family, respond to romantic attractions, and become readily absorbed in cultural pursuits. They are affectionate, reliable, and open to experience. They are also on average younger and more physically attractive than antagonists. Agonistic structure thus presents a sharply etched picture — youth, beauty, and positive emotional energy meeting resistance and opposition from malevolent forces seeking only personal domination for its own sake. The polarized emotional responses of readers correlate strongly with this integrated array of attributes. Readers respond with aversion and disapproval to antagonists and with admiration and sympathy to protagonists.

Humans share with amoebas a fundamentally dichotomized orientation to the world. “Approach” and “avoidance” are the two mechanisms that govern an amoeba's activity (A. Buss, 1997; Haidt, 2006; Kevin MacDonald, 1998; Nettle, 2007; Plutchik, 2003). Chemical signals direct it to approach nutrients and to retreat

from toxins. People do the same thing. They approach those things — food, sex, warmth, friends, status — that make them feel good, and they turn away with aversion from those things that make them feel bad. Egoistic displays of dominance evidently have a toxic impact on the nervous system of our respondents.

Humans react and judge. As the scores on emotional responses indicate, judgments can be complex, nuanced, ambivalent. Even so, those complications are only that, complications. They work variations on a basic theme, and that theme is polarized evaluative response. As a team of personality psychologists led by Gerard Saucier explains, in many contexts, across a diverse array of concerns, psychologists identify “a global evaluation factor (good vs. bad).” When personality psychologists use statistical techniques to reduce multiple personality attributions to superordinate factors, they can choose the number of factors to extract. If only one factor is extracted, that factor constitutes a “contrast between desirable and undesirable qualities” (Saucier & Goldberg, 2001, pp. 857, 854). Scores on motives, mating, and personality reveal in detail what counts as desirable and undesirable qualities in characters. Scores on emotional responses lock down these evaluative judgments by placing them in the court of first and last appeal — the court of actual feeling.

Most of the novels included in this study are “classics.” Classics gain access to the deepest levels of human nature. They evoke universal passions and fulfill deep psychological needs, but they do not always produce mimetically accurate representations of human nature. They hold a mirror up to nature, but this mirror, unlike that in *Snow White*, is under no obligation to tell the simple, unvarnished truth. The images produced are filtered through an imaginative lens that adds its own twist to the images it reflects. In the novels in this study, agonistic structure creates a virtual imaginative world designed to give concentrated emotional force to the clash between dominance and affiliation. That imaginative virtual world provides a medium in which readers participate in a shared social ethos. The social ethos shapes agonistic structure, and agonistic structure in turn feeds back into the social ethos, affirming it, reinforcing it, integrating it with the changing circumstances of material and social life, and illuminating it with the aesthetic, intellectual, and moral powers of individual artists.

Protagonists and their associates would form communities of cooperative endeavor. Antagonists exemplify dominance behavior that threatens community cohesion. The organization of characters in the novels thus reflects a basic dynamic in human social interaction. Christopher Boehm argues that hunter-gatherers add a distinctively human level of social organization to the dominance hierarchies that characterize the social organization of chimpanzee bands. Hunter-gatherers are universally egalitarian. They stigmatize and suppress status-seeking in potentially dominant individuals (Boehm, 1999). For individuals, egalitarianism is a

trade-off. No one individual gets all the dominance he would like, but he does not have to submit to the dominance of others. Egalitarianism has an adaptive function in fostering cooperative endeavor, which enhances resource acquisition and the exchange of services and also enhances the power of the group in competition with other human groups (Boehm, 1999; Darwin, 1981; Flinn, Geary, & Ward, 2005; Sober & Wilson, 1998; Turchin, 2006; D. S. Wilson, 2007).

Taking into account not just the representation of characters but the emotional responses of readers, we can identify agonistic structure in the novels as a simulated experience of emotionally responsive social interaction (see Oatley, 1999). That experience has a clearly defined moral dimension. Agonistic structure precisely mirrors the kind of egalitarian social dynamic documented by Boehm in hunter-gatherers — our closest contemporary proxy to ancestral humans. Agonistic structure in these novels seems to serve as a medium for readers to participate vicariously in an egalitarian social ethos. If that is the case, the novels can be described as prosthetic extensions of social interactions that in non-literate cultures require face-to-face interaction.

The organizing force of an egalitarian ethos in the novels has an implication for a basic question widely discussed among evolutionary literary scholars: whether literature and the other arts fulfill one or more adaptive functions, and if so, what those functions might be (Boyd, 2005; J. Carroll, 2011, pp. 20–29). Various theorists have proposed possible adaptive functions, for instance, reinforcing the sense of a common social identity (Boyd, 2009; Dissanayake, 2000), fostering creativity and cognitive flexibility (Boyd, 2009), serving as a form of sexual display (G. F. Miller, 2000), providing information about the physical and social environment (Scalise Sugiyama, 2001), offering game-plan scenarios to prepare for future problem-solving (Dutton, 2009; Pinker, 1997; Scalise Sugiyama, 2005; Swirski, 2006), focusing the mind on adaptively relevant problems (Dissanayake, 2000; Salmon & Symons, 2004; Tooby & Cosmides, 2001), and providing a virtual imaginative world through which people make emotional sense of their experience (J. Carroll, 2011; Deacon, 1997; Dissanayake, 2000; Dutton, 2009; E. O. Wilson, 1998).

One chief alternative to the idea that the arts provide *some* adaptive function is that literature and the other arts are like the color of blood or the gurgling noise of digestion — a functionless side-effect of adaptive processes (Pinker, 1997). Empirical evidence supporting the idea that literature can fulfill even one adaptive function would undermine the general claim that the arts are functionless side-effects. If dispositions for suppressing dominance fulfill an adaptive social function, and if agonistic structure in the novels fosters dispositions for suppressing dominance, our study would lend support to the hypothesis that literature can fulfill at least one adaptive social function.

Results for characters in the novels of Jane Austen

Overview of results on Austen's novels

Out of the total of 435 characters in the data set, 56, or about 13%, are from Austen novels. All of her characters together received 423 codings, or about 29% of the 1,470 codings for the whole data set. Since we have averaged the ratings for characters who receive more than one coding, each Austen character, no matter how many codings he or she receives, counts only once in the total set of scores for all 435 characters.

Our data indicate that Austen mutes male sexuality, feminizes male motives, and uses an emotional palette largely devoid of Sorrow. Her novels thus embody a female domestic ethos with a positive emotional tone. In the social vision implicit in her fiction, the primary function of the larger social order is to protect and nurture this female domestic ethos. The muting of Sorrow and the correlation between Main Feature and Achieves Goals give evidence that in her imagined world society largely succeeds in fulfilling this function.

In Austen's novels, the desexualized resolutions of domestic romance converge with the depoliticized resolutions of an elite social class isolated from the larger society. By reducing her imagined world to a single social class, she eliminates any serious consideration of class conflict. Within that one class, though, she makes a strong appeal to evolved dispositions for suppressing dominance in individuals. By inviting readers to participate vicariously in an elite social class, she satisfies their impulse toward Social Dominance; by stigmatizing individual assertions of dominance within the elite class, she also fulfills readers' needs for communitarian cooperation.

Motives in Austen's novels

Austen uses motives to diminish differences between the sexes. The unisex character of her imagined world enters fundamentally into the ethos and emotional tenor of the novels, shifting the balance of interest away from sexual romance and toward companionship. Unisexuality reduces conflicts of reproductive interest between males and females, thereby reducing also the struggle for power between them. It brings males and females into closer convergence than they are in the actual world or in the world depicted in the novels of the period as a whole. All these effects contribute to the completeness of the tonal resolutions in the novels — hence to the unusually high level of positive emotionality in readers' experience of Austen. A few critics have intuitively recognized some aspects of unisexuality in Austen's novels — particularly the diminution of specifically sexual romance (D. A. Miller, 2003, p. 4; Tanner, 1986, pp. 130–135). No critic, to our knowledge, has

combined all the aspects of Austen’s unisexuality to form part of a comprehensive interpretive argument.

In contrast to male protagonists in the larger data set, Austen’s male consorts score unusually high on Romance (Figure 5). Even more importantly, they stand far apart from the average male protagonist on Nurture. They score higher on Nurture than both major female sets. They are kinder, gentler males, not so sexually exciting as males in “romance novels” — the pulp fiction genre — but good for the long haul in domestic life. The erotic moment is never a culminating moment for Austen. She glosses over the passionate kiss that seals the deal, and dwells on the terms of the deal. Those terms are the terms of “domestic” romance. The males suitable for this sort of romance are socially decorous, responsible, steady, and companionable. Above all, they are good family men.

Virtually all the characters in Austen’s novels, good and bad alike, are overtly committed to seeking or sustaining high social rank and material prosperity. Now, high social rank and material prosperity are of course the chief constituents of Social Dominance. The difference is that the good characters, and especially the protagonists and their consorts, make fine discriminations of personal and moral value. Antagonists, in contrast, place rank and wealth above all other considerations, or leave other considerations out altogether. Antagonists either recognize better things but sacrifice them to social and material advantage, or they simply fail, out of stupidity or bad nature, to recognize any forms of value except rank and fortune. Instances of antagonistic characters who see the better and follow the worse include Wickham in *Pride and Prejudice*, Willoughby in *Sense and*

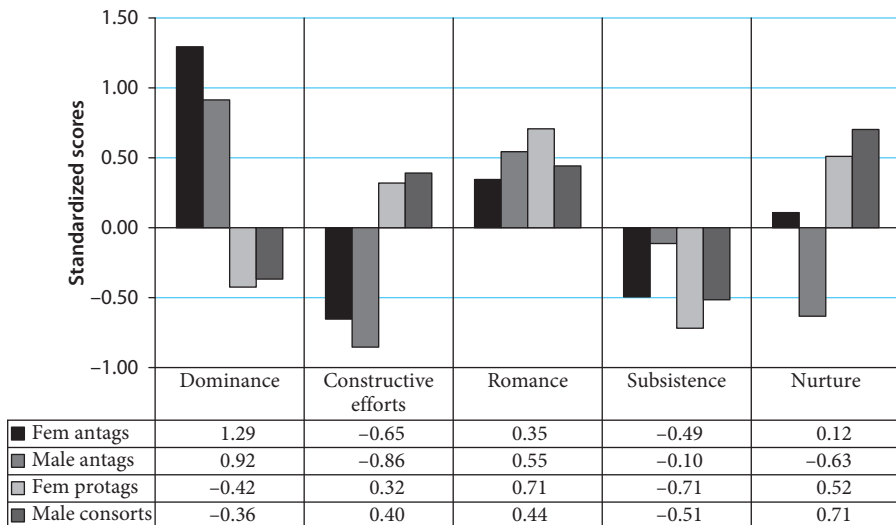


Figure 5. Motive factors in Austen’s antagonists, female protagonists, and male consorts

Sensibility, Henry Crawford in *Mansfield Park*, and William Elliot in *Persuasion*. Instances of antagonistic characters who follow the worse because that is all they see include Isabella Thorpe and Captain Frederick Tilney in *Northanger Abbey*, Mr. Collins and Lady Catherine de Bourgh in *Pride and Prejudice*, the Reverend Philip Elton and his wife in *Emma*, John Dashwood and Robert Ferrars in *Sense and Sensibility*, Anne Elliot’s father and sister in *Persuasion*, and Mrs. Norris in *Mansfield Park*.

Since Austen restricts all her major characters to the members of the leisure class, they receive uniformly low scores on Subsistence as a motive. Jane Fairfax’s anguish at the prospect of becoming a governess, in *Emma*, suggests the intensity of the selective pressure for remaining within the leisure class. By restricting her major characters to a single social class, Austen restricts the conflict between communitarian motives and Social Dominance to interpersonal relations within that class. She thus derogates Social Dominance as an individual motive but also tacitly affirms the social legitimacy of the dominant class. Each of her protagonists wins a secure position within that class.

Criteria for selecting marital partners in Austen

The feminizing of Austen’s male consorts extends into their criteria for selecting mates (Figure 6). In this category, the male consorts are much more like Austen’s female protagonists than like male protagonists in the whole set of novels in this

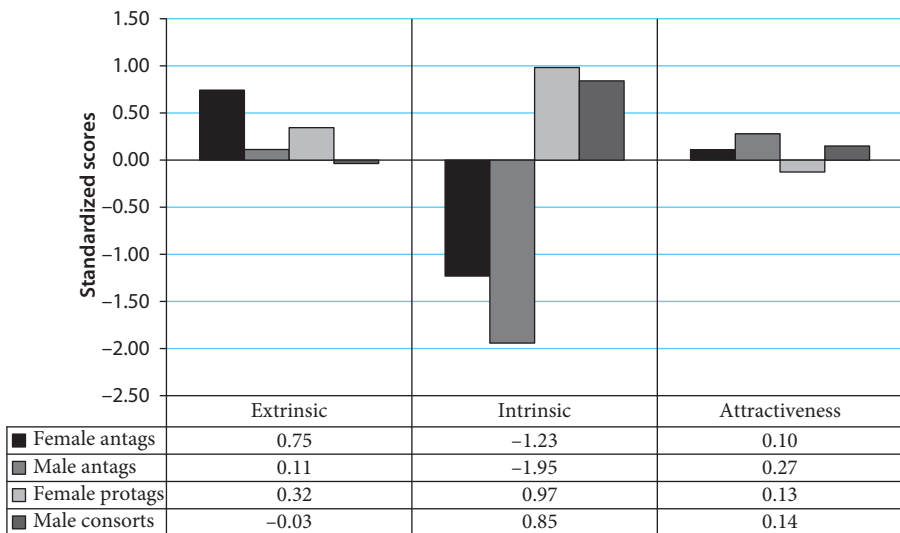


Figure 6. Criteria for selecting marital partners in Austen’s antagonists, female protagonists, and male consorts

study. With a minor qualification for Catherine Morland of *Northanger Abbey*, Austen's female protagonists are all attractive; there are no plain Jane Eyres. But physical attractiveness is not the main thing that attracts the males to them. Austen's male consorts select marital partners not on the basis of sexual passion but on the basis of their admiration and respect for qualities of character and mind.

Emotional responses to Austen's characters

Our data indicate that the emotional tone of Austen's novels is considerably more positive than the emotional tone in the average novel of the period. Across the whole body of novels, antagonists score below average in eliciting sorrow, and protagonists score above average. In Austen's novels, in contrast, protagonists and their consorts, along with antagonists, score below average in eliciting Sorrow (Figure 7). This feature of Austen's imagined world probably accounts for a good deal of her extraordinary popularity. Everybody likes to be cheerful. But good cheer alone is not enough; we readily detect false cheer and find it jarring. Feminizing her male consorts makes it easier for Austen to maintain a positive emotional tone. Achieving a companionable marital bond is as much a need for the males as it is for the females. We have already observed that feminizing males reduces the tension of conflicting male/female reproductive interests. Male characters are also exceptionally well integrated into the emotional fulfillment the readers derive from the resolutions of the plot. That is, the emotional fulfillment of a stable domestic bond includes the male as well as female characters. In contrast to the pattern in

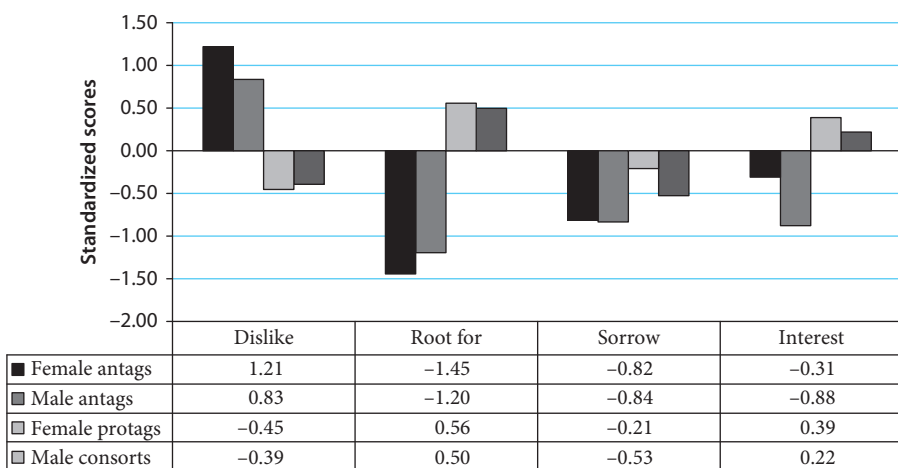


Figure 7. Emotional responses to Austen's antagonists, female protagonists, and male consorts

the larger data set, Austen's male consorts score higher on Interest than either antagonistic set, though still not so high as female protagonists.

Discussion of the results for Austen's novels

Austen's novels are all love stories, but love stories of a peculiar kind. They are romances devoid of sex. The scenes in which female protagonists and their male consorts achieve intimacy are not scenes of passion. They are conversations, civil, lucid, poised, even when heated by underlying indignation or transient distress. The male consorts are less motivated by erotic passion than by the need for companionable society and family partnership. In this crucial respect, they are scarcely distinguishable from the female protagonists.

By muting sexual passion while also eliminating Sorrow from her emotional register, Austen runs a serious risk of being bland. By so successfully evading this danger, she demonstrates how much dramatic interest can be vested in agonistic structure even when it is isolated from other sources of emotional power. Sex and death, it would seem, are unnecessary.

In all of Austen's novels, antagonists who value only Social Dominance are placed in conflict with protagonists who value the qualities of mind and character that evoke admiration and liking in readers. In *Northanger Abbey*, *Pride and Prejudice*, *Sense and Sensibility*, and *Mansfield Park*, protagonists who embody personal merit are set at a disadvantage in relation to antagonists who possess greater wealth and power. In *Emma*, this basic conflict is displaced onto Jane Fairfax, who is in important ways more like a standard protagonist than is Emma herself. The central problem situation in *Persuasion* is that Anne Elliot is pressing toward the end of the nubile age range, but she finds herself in this precarious position precisely because early in life she had rejected a suitor who was not sufficiently wealthy. In all the novels, merit and privilege are set in tension with one another, and in all the novels, the resolutions of the plot resolve this tension.

If the political views of our respondents are at all representative of contemporary students and teachers of literature — and we have no reason to suppose they are not — many of them are probably to the left of the center point in the political spectrum. Nonetheless, when the respondents read Jane Austen, they slip easily and comfortably into the ideological norms that characterize the stance of a privileged elite. Whatever political theses our respondents might formulate about the novels, their scores on Root For and Dislike reveal that they participate vicariously in the emotional resolutions Austen provides for her characters.

The ease with which most readers accept social privilege in Austen's novels can be explained, we think, by the closed social circle in which her characters live.

In the novels of Dickens and Eliot, the egalitarian ethos manifests itself in a scathing critique of class differences. In Austen's novels, the same ethos operates by suppressing dominance within the single class to which she devotes her attention. Austen defines that class primarily through "manners," a word that denotes a personal style distinguished by intelligence, poise, cultivation, and a courteous regard for the feelings of others. People who exemplify that style belong to the "gentry." Whether or not they possess a country estate, they are "ladies" and "gentlemen." When Lady Catherine de Bourgh is trying to persuade Elizabeth not to marry Darcy, she says, "If you were sensible of your own good, you would not wish to quit the sphere, in which you have been brought up." Elizabeth responds, "In marrying your nephew, I should not consider myself as quitting that sphere. He is a gentleman; I am a gentleman's daughter; so far we are equal" (Austen, 2001, p. 232).

In Austen's world, possessing gentle manners depends heavily on birth and wealth, but Austen discriminates sharply between two possible attitudes toward birth and wealth. Her antagonists typically regard birth and wealth as necessary, sufficient, and exclusive criteria for status as gentlefolk. Her protagonists and their consorts, in contrast, regard manners as the decisive criterion. One crucial test for Darcy is whether he can make that distinction. Austen's uncle and aunt Gardiner live on Mr. Gardiner's income as a merchant. Their class identity is thus borderline. They nonetheless pass the test of manners. By recognizing that the Gardiners pass this test, Darcy himself passes a crucial test. He moves decisively into the protagonistic field. Lady Catherine, of course, despite her birth and wealth, fails the test of manners. The climactic scene in which Elizabeth trounces Lady Catherine in debate provides readers the kind of pleasure that is specific to suppressing dominance. By identifying with Elizabeth, modern readers participate vicariously in a world of high social rank while nonetheless remaining true to the egalitarian ethos.

It is little wonder, then, that Austen is so perennial a favorite. She is a shrewd, penetrating psychologist, and she is caustic enough to gratify malice, but her tonal trajectory remains resolutely focused on an ultimate felicity. She invites her readers to participate vicariously in the satisfactions of a companionable pair bond untroubled by conflicting male and female sexual needs. If they follow her prompts, Austen's readers also join a fictional community populated exclusively by members of a privileged elite but governed internally by an egalitarian ethos. With sexual and social conflict thus contained, readers need fear no distressing appeals to their compassion, their tolerance, or their powers of endurance. They need only luxuriate in an imaginary world regulated by high qualities of character, illuminated by wit, graced by elegance of style, and blessed by good fortune.

Conclusion: Quantitative literary hermeneutics

Research that uses a purely discursive methodology for evolutionary literary study remains passively dependent on the knowledge generated within an adjacent field. The methodological barrier that separates discursive literary study from the evolutionary program in the social sciences limits the scope and significance of both literary study and the evolutionary human sciences. The production and consumption of literature and its oral antecedents is a large and vitally important part of our specifically human nature. An artificial barrier that leaves evolutionary literary scholars as passive consumers of knowledge also leaves evolutionary social scientists cut off from any primary understanding of one of the most important and revealing aspects of human nature. Literature and its oral antecedents derive from a uniquely human, species-typical disposition for producing and consuming imaginative verbal constructs. Removing the methodological barrier between humanistic expertise and the expertise of the social sciences can produce results valuable to both fields.

In the statement of purpose that we included on our website, along with the questionnaire, we listed a set of questions we hoped our research would help us to address, and the final question we posed was this: “can literary works be mined as rich sources of data for formal psychological studies?” In our view, the answer is unequivocally yes. For instance, in analyzing the different ways in which male and female authors construct male and female characters, we are conducting a formal psychological study. That study operates in a field similar to that occupied by Ellis and Symons in their study of pornography and romance novels (1990), though we are using dead people (nineteenth-century authors) as our subject pool. As it happens, dead people serve very well as subjects of research, so long as they leave records behind them. They work just as well as the authors of romance novels, even if the authors are still living. The people who make up our respondent pool were all live subjects (and we sincerely hope they all still are — our warmest thanks to them for their participation). We conducted formal psychological studies on them, too. To what do they respond emotionally? Which personality factors and motives excite which specific basic emotions in them? Does the sex of a respondent significantly influence responses? (The answer, rather surprisingly, was no.) All questions that bear on the model of literature as a medium of social interaction are questions simultaneously of literary study and of research in the social sciences. In that sense, every analysis we have conducted in this study is a “formal psychological study.”

We do not envision a form of research in which men and women in white lab coats produce nothing, with respect to literary texts, except tables of numbers and mathematical equations. In this current study, we have ourselves sought to

integrate the forms of expertise that are particular to a humanistic training with the forms of expertise that are particular to a training in the social sciences. We constructed our questionnaire on the basis of our models of human nature and of literature as a mimetic and communicative medium, and we also drew freely on our knowledge of how fictional prose narratives tend to work. On the basis of research into both human nature and the novels in this period, we made predictions about the scoring patterns in the character sets. The responses to the questionnaire produced data from which we drew inferences about the population of the novels. Some of the most important and far-reaching of the generalizations thus produced were ideas we had not ourselves foreseen. In reflecting on our findings, we drew connections among seemingly disparate concepts in different disciplinary fields — in the study of emotions, personality, motives, mate selection, literary history, and literary theory. This analytic and reflective process broadened and deepened our understanding of the novels. We make no claim that the results reported here exhaust the possibilities of meaning in these texts, or that they exemplify a comprehensively adequate design of research. Our central purpose has been to contribute to a body of knowledge that can be, and should be, empirical, cumulative, and progressive.

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