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Why Warmth Matters More Than Competence: A New Evolutionary Approach

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Abstract
Multiple lines of evidence suggest that there are two major dimensions of social perception, often called warmth and competence, and that warmth is prioritized over competence in multiple types of social decision-making. Existing explanations for this prioritization argue that warmth is more consequential for an observer's welfare than is competence. We present a new explanation for the prioritization of warmth based on humans' evolutionary history of cooperative partner choice. We argue that the prioritization of warmth evolved because ancestral humans faced greater variance in the warmth of potential cooperative partners than in their competence but greater variance in competence over time within cooperative relationships. These each made warmth more predictive than competence of the future benefits of a relationship, but because of differences in the distributions of these traits, not because of differences in their intrinsic consequentiality. A broad, synthetic review of the anthropological literature suggests that these conditions were characteristic of the ecologies in which human social cognition evolved, and agent-based models demonstrate the plausibility of these selection pressures. We conclude with future directions for the study of preferences and the further integration of social and evolutionary psychology.

Keywords
agent-based model, anthropology, cooperation, evolutionary psychology, social cognition, social psychology

A wide literature in social psychology has shown that people care more about other people's disposition to help or harm than about their ability to do so. The dominant explanation for this primacy of "warmth" over "competence" is that people's warmth is more consequential for an observer than is their competence (e.g., Abele & Wojciszke, 2007, 2014; Cuddy et al., 2008; Fiske et al., 2007; Wojciszke et al., 1998). This explanation, however, merely shifts the explanatory burden one step back. Why is warmth more consequential than competence? Here, we offer a new explanation for this asymmetry in priorities, grounded in an asymmetry in humans' natural ecology of cooperative partner choice. We first offer a brief review of the evidence that people are more sensitive to others' warmth than to their corresponding competence. Second, we present the existing explanations for this phenomenon and describe their shortcomings. Finally, we offer a novel explanation based on the dynamics of cooperative partner choice among ancestral humans. Drawing on an integrative review of multiple lines of research, we describe the relevant features of the ancestral ecology and how these features would have likely created selection pressures for prioritizing warmth over competence in social cognition. We have also constructed agent-based models that simulate the evolution of partner-choice psychology and demonstrate that the ecological features we identified can in fact lead to the evolution of the observed psychological design.

Caring More About Dispositions Than Ability

Multiple lines of research indicate that people care more about people's intentions to harm or benefit others than about the extent of their ability to effectively do so (or the extent to which they have actually done so). In the subsections below, we review key findings from three fields of inquiry that support this conclusion.

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First, we offer a preliminary note on terminology: The research programs we reviewed used different terms for these two dimensions (e.g., competence/productivity/agency vs. warmth/generosity/morality/communion), but these are overlapping (although not fully synonymous) ways to refer to common underlying concepts: people's ability to effectively create harms or benefits for themselves and others and people's disposition to help or harm another. For convenience, we primarily refer to the former concept as "competence."

We prefer the term *welfare trade-off ratio* (WTR) for the latter concept (Delton & Robertson, 2016; Tooby & Cosmides, 2008; Tooby et al., 2008). WTR captures the degree to which someone is motivated to help or harm someone else by measuring how actors weigh the utility of the other person relative to their own. For example, if Jack prefers to forgo up to $1 so that Jill can receive $2, Jack's WTR toward Jill is 0.5. If Jack is willing to forgo up to $1 to prevent Jill from receiving $2, Jack's WTR toward Jill is −0.5. WTR captures both positive and negative valuations of another's welfare and likely underlies social treatment across a range of situations (e.g., Delton & Robertson, 2016; Sznycer & Lukaszewski, 2019; Sznycer & Patrick, 2020; Tooby & Cosmides, 2008; Tooby et al., 2008). WTR has the advantage of referring precisely to the magnitude of an actor's motivation to help or harm another specific person, which is the relevant parameter in the ecology of cooperative relationships that we describe, without implying other traits that are connoted by the other terms in the literature (e.g., the social skills and interpersonal style implied by warmth, the character implied by general morality). However, most of the research we reviewed used other terms (e.g., warmth, morality), so we conceptually translate this to WTR. There is evidence that when people consider another person's dispositional traits (e.g., kindness, trustworthiness) without the target of those dispositions specified, what people actually consider is how the person will treat them in particular (i.e., the person's WTR toward them; Krems et al., 2021; Lukaszewski & Roney, 2010), so this translation seems to be consistent with actual social psychology. Note as well that when we refer to WTR, we are referring to the conceptual variable, not to a score on any particular measure in the literature.

Social cognition

Social-cognition researchers have concluded that much of how people perceive social others can be captured by two main dimensions, which correspond to WTR and competence (for reviews, see e.g., Abele & Wojciszke, 2014; Fiske, 2018; Fiske et al., 2007; Wojciszke, 2005). For example, in a study in which participants were asked to sort personality traits into categories of traits that typically go together in people they know, multidimensional scaling of the sorting decisions suggested that people grouped personality traits along these two dimensions (Rosenberg et al., 1968). This basic structure of social perception has been observed across multiple facets of social cognition (e.g., face perception, knowledge of familiar others, group stereotypes), has been observed cross-culturally, and likely corresponds to the actual structure of personality traits (Abele et al., 2008; Cuddy et al., 2009; Fiske & Durante, 2016; Stolier et al., 2020; Ybarra et al., 2008).[1] A key finding that emerged is that these dimensions are not of equal importance: WTR has been shown to be the primary component of person perception; WTR cues both have a stronger effect on the overall impression of a person (e.g., positive vs. negative) and are preferentially sought when people choose what traits to learn about a person (e.g., Abele & Bruckmüller, 2011; Goodwin et al., 2014; Wojciszke & Abele, 2008; Wojciszke et al., 1998).

We note that the prioritization of WTR over competence in social cognition is qualified by several interactions that are relevant to its explanation. First, the asymmetry varies depending on the target of evaluation (e.g., Abele & Brack, 2013; Abele & Wojciszke, 2007; Cottrell et al., 2007; Wojciszke, 1994; Wojciszke & Abele, 2008). People care more about WTR cues than competence when they think about others but more about competence than WTR-related traits when they think about themselves (e.g., Abele & Wojciszke, 2007; Wojciszke, 1994; Wojciszke & Abele, 2008). Even when they consider only other people, the relative importance of competence increases as social distance decreases (e.g., going from a peer to a close friend; e.g., Abele & Brack, 2013; Abele & Wojciszke, 2007). This effect is mediated by perceptions of outcome interdependence with the other person, which suggests that people care about another person's competence to the degree that they think that they themselves will be materially affected by the other person's ability to achieve their goals (Abele & Wojciszke, 2007).

Second, the prioritization of WTR over competence in perceiving other people is stronger, on average, when perceiving women than men and when women (vs. men) are the perceivers. Women are commonly perceived as warmer than men, and men are commonly perceived as more competent than women (e.g., Fiske et al., 2002). On average, female perceivers also rely on WTR information in forming impressions of others to a greater degree than male perceivers do (Wojciszke et al., 1998). For example, men are more likely to choose friends on the basis of competence-related traits than women are, whereas women tend to choose friends more on the basis of WTR-related traits than men do (e.g., Eisenbruch & Roney, 2020; Hall, 2011). Any

explanatory theory of why WTR is prioritized over competence should be able to at least accommodate, if not predict, these facts.

Cooperative partner choice

Recently, researchers have used economic tasks to examine people's choices between potential cooperative partners who vary in both WTR (typically operationalized as the share of a resource that they offer) and productivity (the value of the resource they have access to). Participants' choices often reveal a stronger preference for WTR than productivity, effectively caring more about the relative size of the slice they are offered than the size of the pie it comes from (Delton & Robertson, 2012; Eisenbruch & Roney, 2017; Hackel et al., 2015; Raihani & Barclay, 2016; Robertson et al., 2017; but for boundary conditions on the effect, see Dhaliwal et al., 2021). Note that these effects exist even when participants can tell that weighing WTR more heavily than productivity is inconsistent with the incentive structure of the experiment. That is, participants will still choose the generous partner over the productive partner even when it costs them money to do so. Likewise, participants given the ability to exclude partners from subsequent rounds of a public-goods game did so more on the basis of the partners' intended than actual contributions to past rounds (Liddell & Kruschke, 2014). Similar effects have been observed in the real world as well, for example in the workplace (e.g., Casciaro & Lobo, 2008). These results suggest that people prioritize cues of cooperative partners' inclination to help them over their ability to actually do so, even when this priority is materially costly.

Moral judgments

Human moral judgment is largely nonconsquentialist in that moral judgments of actions are informed more by the intended rather than actual consequences of the action (e.g., Cushman, 2008; but for evidence of cultural variation, see McNamara et al., 2019). For example, an identical harm is widely seen as unacceptable if it is intentional but acceptable if it is merely foreseen (Cushman et al., 2006; Greene et al., 2001, 2009). The psychology of detecting defections on social contracts and collective actions appears to be specialized for detecting cheaters (the intention to cheat) rather than instances of cheating (the actual outcome; Cosmides et al., 2010; Delton et al., 2012, 2013). Observations such as these have led some scholars to conclude that human moral judgment is fundamentally focused on people rather than actions; that is, the goal of moral judgment is not to assess the extent to which harm was caused or rules were broken but to assess—and possibly recalibrate—the actor's intentions to help or harm in the future (e.g., Delton & Krasnow, 2015; Krasnow, 2017; Krasnow et al., 2016; Landy & Uhlmann, 2018; McCullough et al., 2013; Uhlmann et al., 2015; for evidence of early emergence of this tendency, see Grueneich, 1982; Jara-Ettinger et al., 2015).

In sum, there is converging evidence from multiple areas of research that social judgments tend to be based more on other people's disposition to help or harm the observer than on their actual ability to do so, even when this does not maximize material welfare. Moreover, the pattern of data indicates moderation by sex and social distance (e.g., Abele & Wojciszke, 2007; Wojciszke et al., 1998), which any explanatory theory should be able to accommodate.

Existing Explanations

Social-cognition researchers explain the primacy of WTR cues over competence cues in person perception on the basis of the relevance of these traits to the observer's self-interest (e.g., Abele & Wojciszke, 2007, 2014; Cuddy et al., 2008; Fiske et al., 2007; Wojciszke et al., 1998). The argument is that another person's WTR is more consequential for the observer's self-interest than is that other person's competence; in other words, people's intention to help or harm has a larger effect on an observer's welfare than does their ability to do so effectively. This may be especially true because humans evolved in cooperative groups and depended on reciprocal altruism, and WTR-related traits may have been a stronger indicator that another person will be a good reciprocator (e.g., Abele & Wojciszke, 2014; Ybarra et al., 2008). Such an asymmetry of consequence—in which observers' outcomes are more affected other people's WTR toward them than their competence—could have created a selection pressure for mechanisms that prioritize WTR in person perception. This explanation is neatly captured by the terms often used to describe WTR- and competence-related traits (e.g., Abele & Wojciszke, 2007, 2014; Fiske et al., 2007): Competence-related traits are described as "self-profitable" because they principally affect the possessor's own outcomes, whereas WTR-related traits (e.g., warmth, morality, generosity) are described as "other-profitable" because they principally benefit people other than their possessor. On this account, it seems intuitive that observers should care more about another person's WTR than competence simply because it affects them more.

We believe there are several reasons that this does not fully explain the phenomenon. First, the self-profitable versus other-profitable dichotomy breaks down in the cooperative ecologies in which humans

evolved (and live currently). Cooperation makes the fruits of one person's competence available to others (e.g., many people may benefit from a good hunter's success) such that competence is "other-profitable," and individuals in a cooperative ecology benefit from being known as trustworthy and generous (e.g., Barclay & Willer, 2007; G. Roberts, 1998) such that WTR-related traits can be "self-profitable." Outcome-interdependent relationships were likely very common among humans' ancestors (e.g., Aktipis et al., 2018). For example, there is some evidence that valuable resources are shared widely throughout hunter-gatherer groups (e.g., Hawkes, 2001; Hawkes et al., 2001), and most hunter-gatherers likely would have died following a temporary disability if not for being a valued relationship partner for someone else (Sugiyama, 2004). Therefore, it is not obvious that warmth-related traits would have consistently been more other-profitable than competence (or that competence would have been more self-profitable) in the ecologies in which humans evolved.

Second, this explanation assumes that other people's intentions are more indicative of the impact that they will have on an observer's material well-being than their competence is, but there is no principled reason why this must be true. In principle, the impact of people's behavior is the product of their intentions and their ability to carry out their intentions, much as a serving of pie is a product of both the size of the entire pie and the relative share of the slice being served. For example, a generous but unskilled hunter might provide 2 lb of meat after a hunt (50% of their 4 lb total yield), whereas a skilled but less generous hunter might provide 5 lb of meat after a hunt (10% of their 50 lb total yield). This reasoning indicates that WTR and competence necessarily codetermine one person's effect on the welfare of another and a priori might be expected to carry equal weight in social perception. Because it is not clear that people's intention to help or harm affects an observer's welfare more than their ability to do so effectively, a satisfactory explanation for the prioritization of WTR over competence cannot rest on this assumption.

Recently, a signaling-based explanation for the tendency to choose generous over productive partners has been offered (Dhaliwal et al., 2021). On this account, people who choose generous over productive partners are themselves seen as more generous, moral, and fairer (whereas people who make the opposite choice are seen as more logical and competent), and these reputational benefits cause such people to themselves be chosen more often as cooperative partners. This second-order partner-choice advantage could then promote the evolution of the tendency to choose partners more on the basis of generosity than productivity. Although such reputational effects may exist, note that this account requires a preexisting prioritization of WTR in the population—the benefits of signaling generosity can exceed the benefits of signaling competence only if the rest of the population chooses their partners more on the basis of generosity than competence. Therefore, although reputational concerns may partially explain the partner choices that people make, this account alone is insufficient to explain the emergence of the stronger preference for WTR than productivity.

A New Explanation

We start from the same premise as the dominant theories: that the prioritization of WTR over competence stems from adaptations crafted by the ancestral social ecology. This approach—the heuristic assumption that preferences evolved to solve ancestral problems—has been extremely generative in the study of, for example, mate preferences, political preferences, and food preferences (e.g., Breslin, 2013; Buss, 1989; Little et al., 2007), and it is increasingly being applied to other social preferences (e.g., Eisenbruch et al., 2016; Vigil, 2007). Given the extreme importance of cooperative relationships to humans (e.g., Sugiyama, 2004) and the vast effects that this evolutionary history of cooperation has had on humans' social psychology (e.g., Barclay, 2016; Cosmides & Tooby, 1992, 2005), we expect that human social cognition will contain design features for choosing cooperative partners that would have yielded fitness benefits, on average, in ancestral social environments. As we argued in the section above, people's WTR-related traits need not necessarily have more of an effect on an observer's welfare than does their competence. We propose, instead, that differences in the distributions of WTR and competence throughout the ancestral population of potential cooperative partners created selection pressures that favored the prioritization of WTR over competence in partner choice. Specifically, in the cooperative ecology in which humans evolved, (a) WTR varied more than competence between potential partners, whereas (b) competence varied more than WTR between interactions with a given partner.

Hypothesis 1 is that greater variance in WTR between people made it the more important criteria of partner choice. To understand this, imagine having to choose cooperative partners while blind to either their competence or their WTR toward you. Imagine that two partners are drawn randomly from a population in which the range of WTRs is wider than the range of competence values. In expectation, the difference between the WTRs of the two candidates is larger than the difference between their competences such that being

blind to WTR would result in worse mistakes (missing out on the highly generous partner or inadvertently choosing the malicious one) than would being blind to competence.

Hypothesis 2 is that WTR is more stable across interactions within a given relationship than competence is, which makes it more predictive of the flow of future benefits from that relationship and therefore a more important criteria of partner choice. We can imagine WTR and competence estimates as being forecasts of the benefits that will accrue over the future course of a relationship. If people's WTR toward someone else is more stable over multiple interactions than their competence is, then their WTR at Time 1 is more predictive of their WTR at Times 2, 3, and 4 than their competence at Time 1 is of their later competence. If the point of partner choice is to maximize the expected future benefits of a relationship, then WTR should be prioritized over productivity because it provides the more reliable forecast of future benefits.

Note that there are two distinct mechanisms that produce greater variance in competence than WTR within relationships. The first is that ancestral productive skill was likely domain-specific (e.g., someone who was skilled at hunting may not also be skilled at kin care or tool production), which produces variance between domains of cooperation. The second is that many important forms of ancestral production were affected by luck as well as ability, which produces variance over time even within the same domain. Both of these mechanisms are fully described below. At various points throughout the article, we may refer more directly to one mechanism or the other, but Hypothesis 2 incorporates both mechanisms.

In sum, whereas the standard explanation for the prioritization of WTR over competence assumes a difference in their consequences for an observer, we posit differences in their distributions within and between potential relationship partners. Drawing on the psychological, anthropological, economic, criminological, and zoological literatures, we now describe the likely variances of WTR and competence, both within and between relationship partners, in the ecology of ancestral humans. This will show that the differences in distributions that we posit are likely to have existed in the environments in which human social cognition evolved, thereby selecting for the prioritization of WTR over competence information.[2]

Variance between partners

How much did WTR vary between people in the ancestral environment? The clearest way to address this question may be to consider the range of possible WTRs that one may receive from others in the social environment. There are specific features of the human social structure that serve to increase the breadth of WTRs that individuals may encounter and therefore must be sensitive to. For example, humans tend to live in multimale, multifemale groups that frequently include close kin, distant and affinal kin, and nonkin. Both kin and nonkin may be rivals or cooperators, and these relationships can persist (and possibly change in character) over many decades. This creates exceptional opportunities for alliances and support and for rivalries and conflict. (As a thought experiment, contrast this to the social psychology that would likely evolve if humans lived in single-male harems or hives of relatively uniformly related others, as bees do.) On the high end of possible WTRs, individuals commonly receive tremendous generosity and care from kin, such as parents, siblings, and spouses (e.g., Hrdy, 2011). On the low end, individuals are sometimes willing to bear substantial costs and risks to kill each other (e.g., Daly & Wilson, 1988b; Duntley & Buss, 2011). We argue that the frequency and import of relationships characterized by these extremely different WTRs (detailed below) created a selection pressure for ascertaining and monitoring the WTR that one is likely to receive from a relationship partner going forward and for prioritizing this dimension of social cognition.

Across the life span, humans rely on the care of others for survival. The most obvious example of this comes from the intensive parenting and alloparenting required by young children (e.g., Hrdy, 2011). As examples of the costliness of this care, consider that lactation is extremely calorically demanding (Thomson et al., 1970), and the (often literal) burdens of child care often interfere with a mother's ability to do other things, such as gather food (e.g., Hurtado et al., 1985). That mothers (and, to a lesser extent, fathers and other kin) bear these costs for the welfare of their children over long periods of time suggests the extremely high WTR that children receive from their caretakers.

Adults, too, benefit from the extremely high value that some social partners place on their welfare. Ancestral humans were vulnerable to temporary shortfalls in food production, because of injury, illness, or bad luck, for example, which led to the evolution of reciprocal provisioning relationships (Trivers, 1971). Sugiyama (2004) estimated that 64.7% of the members of one forager-horticulturalist population have experienced a disability of 30 days or longer and therefore would probably have died if not for provisioning from other community members. Even the best food producers in a group are prone to periods of very low production (Hill & Hurtado, 2009) and therefore likely depend on help from others. These relationships of mutual interdependence likely lead individuals to place extremely

high value on the welfare of their reciprocity partners because their fitness outcomes are positively correlated (e.g., Aktipis et al., 2018; Tooby & Cosmides, 1996). Likewise, monogamous couples have highly correlated fitness outcomes (Alexander, 1987), which typically leads to great concern for each other's welfare. Along with parent–child relationships, these relationships of prolonged interdependence and positively correlated outcomes may represent a high-water mark of WTRs available in the social environment. And although it is true that people cannot select their close kin, people can select which kin to engage with and to what degree, which suggests that a form of partner-choice psychology applies even among kin.

In contrast, people are sometimes so determined to harm another's welfare that they kill that person, which represents the low-water mark of available WTRs (Daly & Wilson, 1988b; Duntley & Buss, 2011). This possibility may seem remote in affluent, state-based societies, but it was far more common over the course of human evolution (Pinker, 2011). Murder rates in small-scale societies are commonly 10 to 150 times higher than those in the contemporary United States (e.g., Knauft et al., 1987; cf. Federal Bureau of Investigation, 2017). Among some groups that have been studied, approximately half of adult men had committed homicide, and roughly two thirds of people age 40 and older had lost at least one close relative to interpersonal violence (Chagnon, 1988; Knauft et al., 1987). Even within families, interests sometimes diverge so strongly that relatives kill each other (Daly & Wilson, 1988a). Committing homicide exposes the killer to revenge, which suggests that individuals are sometimes so determined to harm their victim's welfare that they are willing to do so at substantial risk and cost (Chagnon, 1988). Committing homicide therefore reveals an extremely negative WTR, and its prevalence suggests that humans' ancestors had to be alert to the risk of receiving such a low WTR from someone else.

These two extremes—mothers and murderers—suggest the vast range of WTRs that ancestral humans might have received in their social ecology. Between these extremes lie myriad continuously variable dispositions—apathy for strangers, concern for acquaintances, deeper concern for friends, and so on—that populate the social world. We argue that this extreme variance in available WTRs selected for preferential attention to the WTRs that people expect to receive from others because failing to monitor these WTRs could result in overlooking important threats and opportunities. But how does this compare with the variance in competence between potential social partners in the ancestral ecology?

How much did competence vary between people in the ancestral environment? In contemporary industrialized economies, individual differences in the ability to create material benefits are enormous—consider the incomes of Jeff Bezos and his median warehouse worker. (Although the range within an individual's immediate social circle is likely somewhat smaller, given social assortment by income, education, etc.) Differences in the ability to create material benefits in the environment of humans' ancestors, although appreciable and important, were far more moderate.

Anthropologists have attempted to characterize the degree of inequality among hunter-gatherers using the Gini index, a metric typically used to measure income inequality within modern economies (E. A. Smith, Borgerhoff Mulder, et al., 2010; E. A. Smith, Hill, et al., 2010). This is of interest because differences in wealth suggest differences in the ability to confer benefits on a cooperative partner. Overall, Gini values are approximately 0.25 in hunter-gatherer societies, which is lower than in pastoral or agricultural societies (0.4–0.5) or modern economies (0.25–0.6; World Bank, n.d.). Gini values among hunter-gatherers are lowest for embodied capital (e.g., physical strength, knowledge, and skills; $M = 0.22$) and relational capital (e.g., number of exchange partners; $M = 0.23$) and higher for material wealth (e.g., land rights, household goods; $M = 0.36$), which suggests that there is less inequality in the traits that contribute to the ability to produce benefits than in actual wealth achieved (E. A. Smith, Borgerhoff Mulder, et al., 2010; E. A. Smith, Hill, et al., 2010). Collectively, this method suggests that variance among hunter-gatherers in the ability to produce material benefits is low to moderate relative to modern economies.

To more directly estimate the variance in productivity in the ancestral environment, we can examine variance in hunting returns. There are several reasons to focus on hunting in this context: Hunting was likely a driving force in human evolution (e.g., Hill, 1982), and there is evidence that humans evolved cognitive capacities in response to the problems created by hunting (e.g., Geary, 1995; Silverman & Eals, 1992). Because hunting has greater variance of outcomes than gathering plant foods (e.g., Kaplan et al., 1985), focusing on hunting should yield a higher estimate of competence variance than focusing on gathering or both hunting and gathering and is therefore more conservative with respect to our hypothesis. Hill and Kintigh (2009) analyzed hunting outcomes of 147 Aché hunter-gatherers over 27 years and found a fivefold difference in mean return rates between the best and worst hunters. Reanalyzing the same data set, McElreath and Koster (2014) found that success rates (i.e., the percentage of hunts yielding

any meat) range from 15% to 70% among men ages 33 to 46, which is approximately the age of peak hunting productivity. During peak hunting years, the best hunters return 8 kg of meat per hunt, on average, compared with 4 kg for the worst hunters. Thus, there is approximately a twofold difference in average total returns and a 4.67-fold difference in success rates between the best and worst hunters during the years of peak productivity. Other estimates indicate slightly higher variance. For example, a study of 10 !Kung hunters found a tenfold difference in mean meat obtained per day between the best and worst hunters (Yellen, 1977), but some of this additional variance is likely due to the relatively larger, rarer animals that the !Kung hunt (Hill & Kintigh, 2009). Given this evidence as a whole, an estimate of a twofold to tenfold difference in productive ability between the best and worst hunters appears reasonable.

Another domain of ancestral activity, coalitional violence, also allows us to estimate the scale of individual differences in competence. In hunter-gatherer societies, small coalitions (typically male) sometimes form to drive out or execute a member of the group who is excessively aggressive. What matters to the success of these coalitions is the willingness of individuals to join, not the formidability of those individuals. This is because a coalition of several individuals—even individuals low in formidability—can nearly always defeat even a very strong single person (e.g., Wrangham, 2019). This reveals that competence in the domain of violence is fairly tightly bounded such that no one individual can surpass even a small group.

It is difficult to directly compare variance in WTRs with variance in competence because they do not share a common metric. However, the above evidence strongly suggests that between-persons variance in expected WTR was likely far greater than between-persons variance in competence. The WTRs that a person might have received in the social environment had extreme range, from individuals who were determined to sustain one's life to individuals who were determined to end it. The competence levels of possible social partners likely had a much smaller range. To take a high estimate, the best producer may have been 10 times as valuable as the worst producer over a short period of time (Hill & Kintigh, 2009; Yellen, 1977). It seems safe to assume that the most helpful possible social partner (e.g., a mother) was far more than 10 times as valuable as the most harmful possible social partner (e.g., a murderer).

A convergent argument is that competence is a trait (e.g., height, complexion) that does not change for different interaction partners. On the other hand, WTR is target-specific and will vary with different personal interests. For example, a single individual may be one person's parent, another person's potential mate, and another person's rival. In other words, WTR is a property of a relationship, not a property of a person. Thus, a single person represents a range of WTRs to the different individuals considering them. This complicates the task of choosing cooperative partners on the basis of WTR because the problem to solve is predicting how someone will treat oneself in particular.

There is evidence that social cognition reflects the target-specificity of WTR. When choosing friends and mates, people do not want a partner who is kind in general, but a partner who is kind toward themselves in particular and even potentially unkind toward their rivals (Krems et al., 2021; Lukaszewski & Roney, 2010). Likewise, Hadza hunter-gatherers disagree with each other on who is moral (e.g., generous and honest) despite evidence of some agreement on which traits constitute moral character (e.g., generosity and hard work; K. M. Smith & Apicella, 2020). This suggests that moral behavior is less a feature of specific people than of specific relationships; the same individual is likely much more generous to some people than to others, and these dispositions are stable within relationships. In contrast, there is no similar dynamic that varies competence across relationships—evidenced by the substantial agreement among the Hadza regarding rankings of hunting skill (K. M. Smith & Apicella, 2020). Research in personality psychology points to a similar conclusion. The social-relations model partitions variance in perceptions of different traits into perceiver-specific, target-specific, and relationship-specific components. There is greater relative relationship-specific variance versus target-specific variance for WTR-related traits such as considerateness than for capacity traits such as intelligence (Kenny & Albright, 1987). In other words, people are perceived as being smarter or dumber than others but as more or less considerate *to* specific others. We argue that the greater variance between potential social partners in WTRs, which (unlike competence) are both target-specific and include the possibility of negative values (i.e., motivation to harm), created a selection pressure for greater attention to and preference for cues of others' WTRs than their competence levels.

Variance within partners

How much did WTR vary between interactions in the ancestral environment? To this point, we have reviewed the different levels of variation in WTR and competence that existed between potential cooperative partners in human ancestral environments. Now, we turn our attention to the within-partner variation in these variables. How stable across interactions, spanning time

and different cooperative activities, were the WTR and competence levels that an individual could expect from a social partner? In developing this sketch, we are deliberately not relying on research on the stability of traits such as personality and intelligence (e.g., Hertzog & Schaie, 1986; B. W. Roberts & DelVecchio, 2000). This is because personality and general intelligence are not quite the relevant variables. As discussed above, WTR is not a personality trait but a feature of a particular relationship. Although general intelligence likely contributed to ancestral competence, the ability of human ancestors to produce resources was also strongly influenced by acquired, specialized expertise; physical ability; and luck (discussed further below) such that the stability of general intelligence would overestimate the stability of actual productive ability.

By design, WTR was likely to be largely stable across time and interaction types within relationships. In other words, if people were generous toward you on Monday, they are likely to be generous on Tuesday and Wednesday as well, and if they were generous toward you in dividing meat, they are likely to be generous to you when providing child care or social capital as well. Likewise, someone who displays a low regard for your welfare in one interaction is unlikely to be highly caring in the next interaction, barring intervening events that warrant a WTR revision (e.g., a feud, a betrayal, a gift, a reconciliation, a dramatic change of circumstance; see e.g., McCullough et al., 2013; Sznycer & Lukaszewski, 2019; Sznycer, Xygalatas, Agey, et al., 2018; Sznycer, Xygalatas, Alami, et al., 2018). The clearest example of this may come from the extremely high WTR that individuals receive from parents and alloparents over the course of decades (see above), but WTRs are likely to be stable in other relationship types as well. This assumption is supported by foundational work on WTR and evidence of stability in social relationships among humans and nonhumans.

Decisions about how to allocate costs and benefits between the self and another person are likely made by specialized, evolved cognitive machinery that produces a WTR by integrating a variety of variables that pertain to the other person (e.g., degree of relatedness, value as a cooperative partner, formidability) and a variety of variables that pertain to the situation (e.g., the size of the resource to be divided, the audience to the decision; Cosmides & Tooby, 2013; Delton & Robertson, 2016; Tooby et al., 2008). A wide body of evidence (including from the conceptually similar approach of "social discounting") has shown that people make WTR judgments in consistent and predictable ways, for example privileging kin over friends and friends over acquaintances (e.g., Delton, 2010; Jones & Rachlin, 2006, 2009; Osiński, 2009, 2010; Rachlin & Jones, 2008; Safin et al., 2013; Stewart-Williams, 2007; for a review, see Delton & Robertson, 2016). Note that the WTR used by one person toward another is likely to be autocorrelated across interactions because the person-level features that it integrates are largely stable. For example, kinship is static, and traits such as formidability, social status, and skill level typically change slowly and predictably. Specific events that dramatically recalibrate WTR, such as defections or reconciliations, are emotionally salient precisely because they represent discontinuities or expectation violations within the relationship (e.g., McCullough et al., 2013; Tooby et al., 2008; see also Sznycer & Lukaszewski, 2019; Sznycer, Xygalatas, Agey, et al., 2018; Sznycer, Xygalatas, Alami, et al., 2018). In sum, then, WTRs are likely to be stable across time and interaction types because the inputs to their calculation are largely stable.

This theoretical stability is borne out by the intuitive, real-world observation that the nature of relationships is typically stable across long time spans. For example, it is common for friendships to persist for years; closer friendships have greater longevity than more casual relationships (Hiatt et al., 2015; Yanıklar, 2012), and relationship stability increases as people mature (e.g., Branje et al., 2007; Poulin & Chan, 2010; Yanıklar, 2012). Mollenhorst et al. (2014) found that approximately half of personal relationships among adults persisted over the course of 7 years. The majority of relationships that dissolved over this period did so for lack of opportunity to spend time together (e.g., because of a job change), not because of a change in the emotional character of the relationship itself (e.g., because of a fight; Mollenhorst et al., 2014). This suggests that WTRs toward friends may be even more stable than the relationships themselves. Research on antipathetic relationships is less plentiful and mostly conducted in children and adolescents (reviewed by Card, 2010), but there is evidence that the negative WTRs felt toward rivals are as long-lasting as the positive WTRs felt toward friends (Wiseman & Duck, 1995).

Many nonhuman animals also form social relationships that range from alliances to reciprocal grooming partnerships to a simple tendency to be near each other. These relationships are similar to human friendships in that they entail preferential treatment of particular individuals in multiple interactions over time and may rely on similar cognitive and physiological mechanisms (Massen et al., 2010; Seyfarth & Cheney, 2012; Silk, 2002). The stability of these relationships—that is, that the quality of treatment at Time A predicts the quality of treatment at Time B—has been observed in horses, mice, macaques, capuchins, chimpanzees, baboons, and dolphins, and some dyads have experienced relationships that are stable over the course of

years to a decade (Cameron et al., 2009; Kalbitz et al., 2016; Koski et al., 2012; Langergraber et al., 2009; Massen & Sterck, 2013; Mitani, 2009; Perry, 2012; Silk et al., 2010, 2012; Weidt et al., 2008; Wiszniewski et al., 2012). This suggests that the cognitive machinery producing stable treatment across multiple interactions within relationships is extremely evolutionarily old and/or has convergently evolved in multiple lineages.

How much did competence vary between interactions? Evidence suggests that ancestral humans cooperated in many domains, including large-game hunting, plant-food gathering, other foraging (e.g., for honey), cooking or other food processing, marshalling and exerting social influence, fighting (intergroup and intragroup), caring for children and other kin, manufacturing and using specialized tools and artifacts, processing plants for medicinal use, and likely other domains as well (e.g., Hrdy, 2011; Jaeggi et al., 2016; Marlowe, 2007, 2010). Rather than one-off cooperative interactions, humans form long-term cooperative relationships that span multiple interactions and activity domains (e.g., the same relationship might include cooperation in foraging, tool manufacture, politicking, and caring for kin), and aid provided in one domain may be reciprocated in a different domain (Jaeggi et al., 2016). Above, we argued that the generosity received from a partner at one time is likely to be predictive of the partner's generosity at another time (even in a different cooperative domain) because WTR judgments are stable by design. But what about the ability to create benefits? Here we argue that competence is less stable across interactions; in other words, how good someone is at creating benefits in interaction A is less predictive of their ability to create benefits in interaction B. This is because the skills and knowledge that hunter-gatherers rely on are domain-specific and take time to acquire and because even highly skilled foragers experience high variance in their outcomes over time.

Turning first to the question of intraindividual variance in competence across time (but holding the domain of production constant), evidence suggests that foragers commonly experience semirandom episodes in which they are unable to produce resources, largely because of injury and illness. Using a database of health insults among a forager group (e.g., infections, lacerations, bites), Sugiyama (2004) estimated that 64.7% of foragers have experienced a disability of at least 30 days, and 94% have experienced a disability of at least 7 days. Even when foragers are healthy enough to produce, there is wide intraindividual variance in outcomes, particularly in the domain of hunting. Even the best hunters experience large fluctuations over time in their hunting returns, including periods of very low yields (Hill & Hurtado, 2009; Hill & Kintigh, 2009). For example, approximately half of hunts among the Aché fail to produce any meat at all, largely because of factors outside of the hunter's control, such as weather and animal movements (McElreath & Koster, 2014).

There is less research directly comparing competence across domains than production over time within a single domain, but we can nonetheless develop a rough estimate of the domain specificity of competence. There is reason to believe that competence in one domain has limited power to predict competence in another domain, given that there are traits that contribute to multiple types of productive ability, such as physical strength, general intelligence, and health (e.g., Gottfredson, 2002; von Rueden et al., 2008). However, productivity in the ancestral environment was likely largely domain-specific because it relied on deep, specialized knowledge acquired over time. A clear example of this is large-game hunting. Men do not reach their productive peak as hunters until approximately age 40, after physical strength has begun to decline (Gurven et al., 2006; for a review of similar findings, see Lew-Levy et al., 2017). This is because hunting success is heavily dependent on experience and specialized knowledge, such as the ability to identify animal species from their tracks, which take decades to acquire. Although not as extreme an example as large-game hunting, efficiently gathering and extracting plant foods also depends on expertise that takes years or decades to develop (Kaplan et al., 2000). Other valued skills, such as the ability to manufacture complex tools, musical ability, and knowledge of medicinal plants, also require a long time to acquire and continue developing well into adulthood (e.g., Begossi et al., 2002; Lew-Levy et al., 2017; Schniter et al., 2015). Because time and experience are finite and exclusive, there are trade-offs to developing any particular skill. Therefore, expertise in one area is unlikely to strongly predict expertise more generally. Although there may have been fewer productive niches in the small-scale societies of ancestral humans than in contemporary Western populations (Smaldino et al., 2019), recall that the key comparison is not between the domain specificity of production then versus now but between the domain specificity of production versus that of WTR.

In summary, we developed, on the basis of humans' evolutionary history of selecting social partners for long-term cooperative relationships, two novel hypotheses for why Person A cares more about how Person B intends to treat them (WTR) than about Person B's ability to effectively carry out those intentions (competence):

Hypothesis 1: WTR is prioritized over competence because it varied more between possible partners.

Hypothesis 2: WTR is prioritized over competence because it was less domain-specific (i.e., it varied less between interactions with a given cooperative partnership).

We argue that these features of the ancestral social ecology created selection pressures that promote the prioritization of WTR in cooperative partner choice and therefore in social cognition more broadly.

Agent-based models that test these hypotheses

To test the mechanistic plausibility of these selection pressures—that is, if WTR really did vary more between relationships but less within relationships relative to competence, would that actually cause the prioritization of WTR to evolve?—we constructed agent-based models (E. R. Smith & Conrey, 2007) in which we parametrically varied these features of the ecology. Effectively, we can observe evolution in a simulated population to test whether the hypothesized selection pressures are likely to actually produce the psychological trait we seek to explain. Similar modeling methods have been productively used by many researchers to study the evolution of other aspects of cooperative-partner-choice psychology (e.g., Aktipis, 2004, 2011; Barclay, 2011; Debove, André, & Baumard, 2015; Debove, Baumard, & André, 2015; Debove et al., 2017; Roberts, 2020). The full methods and results of our models are available at OSF (https://osf.io/h43kp/); we provide a brief summary here.

We simulated populations of agents who chose each other for relationships, cooperated within those relationships, reproduced in proportion to the resources they received as a result (using asexual, fitness-proportionate selection), and died. Each agent had three traits: competence, WTR, and the degree to which they prioritize WTR over competence in partner choice (0.5 indicates an equal preference). Competence was operationalized as the probability of producing a resource; this is realistic with respect to ancestral ecologies because good hunters are distinguished more by their frequency of success than by the size of a typical kill (e.g., McElreath & Koster, 2014). WTR was operationalized as the percentage of the resource shared with the partner; these unilateral resource transfers have been shown to correlate well with WTR as defined elsewhere in the literature (Krasnow et al., 2016). The degree to which an agent prioritized WTR in the first generation was randomly drawn from a normal distribution with a mean of 0.5 and a standard deviation of 0.05 and then evolved over subsequent generations. These populations evolved over 3,000 generations. Code for the simulations is available at https://osf.io/ftwja/.

We manipulated six parameters:

1. We varied the heuristic by which agents chose their partners to show that the prioritization of WTR over competence is not idiosyncratic to a particular partner-choice method. In the "information weighting" cognition type, agents knew both the WTR and competence scores of their potential partners and chose the partner with the highest overall partner value score (calculated according to their WTR prioritization weight). In the "information choice" cognition type, agents chose whether to learn either the WTR or the competence scores of their potential partners (chosen probabilistically according to the degree to which the agent prioritizes WTR) and chose the partner with the higher score on that dimension. Note that both information choice and information weighting are ways in which the prioritization of WTR over competence has been observed in people (e.g., Wojciszke et al., 1998).
2. We varied the duration of cooperative relationships such that expected relationship length was one interaction, 10 interactions, or 50 interactions.
3. We manipulated the population variance of WTR. Agents' WTR values for their first interaction were randomly drawn from a normal distribution with a mean of 0.5, but we manipulated the standard deviation of this distribution to be 0, 0.1, 0.2, 0.3, 0.4, or 0.5. This manipulation (and the corresponding manipulation of competence variance) is key to testing Hypothesis 1.
4. We manipulated the population variance of competence identically to that of WTR.
5. We manipulated the domain specificity of each agent's WTR within their cooperative relationship. Before each subsequent interaction with a chosen partner, both agents' WTR scores were updated using a random walk procedure in which we added to their prior WTR level a value drawn randomly from a normal distribution with a mean of 0 and a standard deviation that was either 0, 0.1, 0.2, 0.3, 0.4, or 0.5. This (and the corresponding manipulation for competence) is key to testing Hypothesis 2 because this standard deviation determines how well WTR in the first interaction predicts WTR in subsequent interactions. When this standard deviation is comparatively large, WTR is more domain-specific (i.e., it varies more between interactions within the relationship). However, when this standard deviation

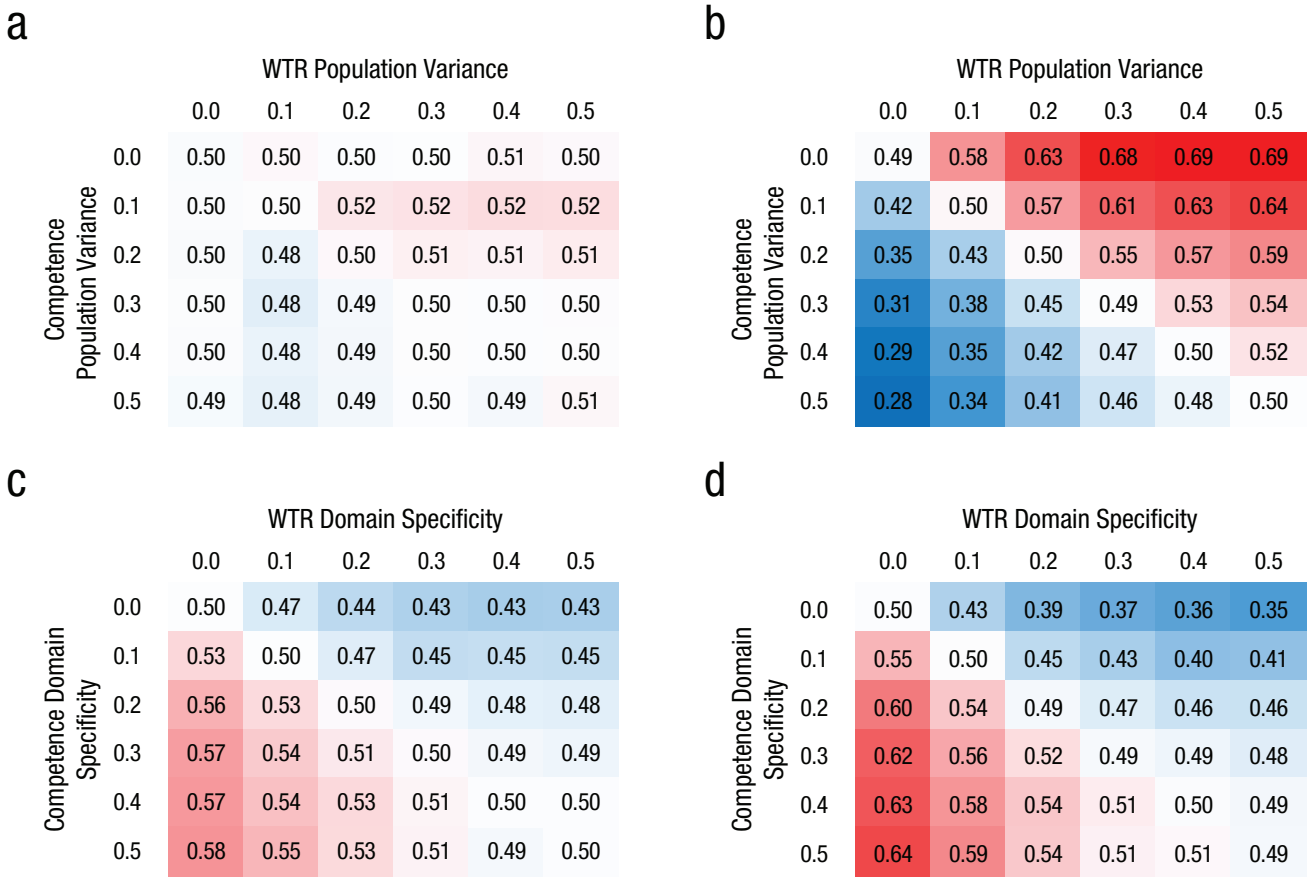

Fig. 1. All models testing Hypothesis 1 (a and b) and Hypothesis 2 (c and d), split by information-weighting (a and c) and information-choice (b and d) cognition types. Cell values are the average degree of prioritization of welfare trade-off ratio (WTR) in the final 500 generations of all model runs at the indicated parameters. Deeper red indicates stronger preference for WTR; deeper blue indicates stronger preference for competence. Results are aggregated across relationship length.

is small, WTR generalizes better across interactions and is therefore less domain-specific.

6. We varied the domain specificity of competence identically to that of WTR.

We ran this full factorial parameter space through 50 iterations at each combination. Our primary analysis is to examine the average prioritization of WTR in the final 500 generations of each population, averaged over all the model runs at each combination. Figure 1 presents these values for varying levels of population variance and domain specificity for WTR and competence, for each cognition type, aggregating across relationship length. The prioritization of WTR evolves when and to the degree that WTR varies more between potential partners than competence does (supporting Hypothesis 1) and when and to the degree that competence is more domain-specific than WTR is (supporting Hypothesis 2). Crucially, this prioritization reverses under the opposite conditions, and no prioritization emerges at all when competence and WTR have identical distributions. There is no effect of population variance under the information-weighting cognition type (Fig. 1a). This was consistent with our prediction; when agents have complete information about their potential partners' traits, there is no reason that the distributions those traits were drawn from should make any difference. For additional predictions, analyses, and discussion, see https://osf.io/h43kp/. Collectively, these results show that the prioritization of WTR evolves because of features of the social ecology—specifically, how WTR and competence are distributed between and within relationships—rather than because of any intrinsic feature that makes it more other-profitable than competence.

Discussion

Multiple lines of research have shown that people care more about people's WTR toward them (i.e., their motivation to provide help or harm, often referred to as

warmth, morality, or communion) than about their ability to act effectively in the world (often referred to as competence or agency). The dominant explanation in the social-psychology literature assumes a difference in the consequentiality of these traits: Observers care more about others' WTR than their competence because they are affected more by it. Here, we propose a new explanation that depends on differences in how WTR and competence were distributed ancestrally, not on any inherent differences in their consequences. We argue that people care more about WTR than competence because it varied more between potential relationship partners but less within relationships, which makes it a more useful basis for selecting cooperative partners. A broad, synthetic review of the anthropological literature shows that these distributions likely characterized the environments in which human social cognition evolved, and agent-based models demonstrate the viability of our hypothesized selective mechanisms. This work therefore connects the rich social-cognition literature to the growing literature in evolutionary psychology suggesting that the need to choose cooperative partners in fitness-enhancing ways was a powerful selection pressure in human evolution (e.g., Barclay, 2016; Cosmides et al., 2010; Cottrell et al., 2007; Delton & Robertson, 2012; Eisenbruch et al., 2016; Eisenbruch & Roney, 2020; Hall, 2011; Lewis et al., 2011; Lukaszewski et al., 2016; K. M. Smith & Apicella, 2019; Vigil, 2007).

We want to make clear the difference between our explanation for the dominance of WTR over competence and the existing explanation based on self- versus other-profitability. The existing explanation holds that there is something intrinsic to WTR that makes it more consequential within an interaction, even assuming identical distributions of these traits. We argue (and our models show) that under identical distributions, these traits have identical consequences for a cooperative partner (i.e., neither can be considered more self- or other-profitable than the other). Our argument is that the different distributions of WTR and competence make WTR the more important criterion of partner choice because of its increased value in predicting the future benefits of a relationship; however, within a given interaction, there is nothing that makes WTR more consequential than competence.

The argument established here can explain from first principles many of the nuanced findings related to sex differences and social-distance effects in the prioritization of WTR. On average, women prioritize WTR over competence in social cognition more than men do (see Caring More About Dispositions Than Ability), men are more willing to tolerate defections in their relationships than women are (e.g., Benenson et al., 2009, 2014), and men are more sensitive to competence information than women are when they divide resources and choose social partners (Eisenbruch et al., 2016, 2019; Eisenbruch & Roney, 2017, 2020; Hall, 2011). Some researchers have attributed these sex differences to contemporary social roles and argued that males are socialized for roles that place comparatively more emphasis on agency and competence-related traits and women are socialized for roles that place relatively more emphasis on communality (e.g., Eagly & Wood, 2016; Madera et al., 2009; Wojciszke et al., 1998). Our account suggests instead that these contemporary sex differences may exist because ancestral men and women faced slightly different distributions of competence and WTR when they selected cooperative partners. Specifically, large-game hunting and coalitional violence were activities more often pursued by ancestral males, and these domains may have been especially high in interindividual variance, particularly variance in outcomes because of differences in competence (see A New Explanation). Therefore, the gap between population variance in WTR versus competence faced by ancestral men may have been less on average than that faced by ancestral women (i.e., shifted down in Figs. 1a and 1b), which thereby exposed the sexes to quantitatively different selection pressures. This dynamic therefore predicts that competence information will be relatively more important in social perception when men are the perceivers and/or targets and likely reaches its apex in the special case of male intrasexual perception. This argument is not mutually exclusive with an explanation of sex differences based on contemporary social roles, so an important area of future research will be testing the degree to which observed sex differences in social cognition appear calibrated by the recurrent features of ancestral ecologies versus reliable patterns of current socialization.

Second, the present models explain the finding that the priority of WTR over competence in social cognition reverses when people think about themselves or others very close to them (see Caring More About Dispositions Than Ability) because decreasing social distance decreases the variance in WTR that one might receive from a partner. Close relationships entail high WTRs almost by definition, so this reduction in WTR variance reduces the need to attend to WTR cues (i.e., moves an observer to the left in Figs. 1a and 1b). For example, strangers may or may not be considerate of observers' interests, but people are (nearly) always considerate of their own or their best friend's interests. Violations of WTR expectations in close relationships are so emotionally salient specifically because they are so unexpected and may require reevaluation of the relationship (see A New Explanation). These violations are likely the

exceptions that prove the rule of relative WTR invariance in close relationships, in contrast to more distant relationships. Note the difference between this account and the standard account of WTR dominance based on consequentiality: A close relationship partner's WTR is unlikely to be less consequential than that of a stranger—arguably, it is much more important because a defection from a close partner can be so uniquely damaging. A model of social cognition that calibrates the relative importance of WTR and competence to their consequentiality within a relationship will therefore struggle to adequately explain why the weight given to WTR decreases in close relationships. A model of social cognition focused on the variances of relevant traits, however, accommodates this finding easily.

Although we focused on priorities when people choose between new cooperative partners, similar dynamics may be at work in the management of existing relationships. Several of the problems that need to be solved in navigating existing relationships—specifically the need to monitor the WTRs and competence levels of existing partners and increase or decrease engagement with a partner on those bases—are similar to the problems encountered when people choose new partners (e.g., Tooby & Cosmides, 1996, 2008). Consistent with this, people perceive a similar "trait space" when they consider both known others and novel individuals (Stolier et al., 2020). Therefore, we argue that the information-seeking and information-weighting mechanisms that evolved for cooperative partner choice are likely also active in monitoring and managing existing relationships. In other words, the prioritization of WTR that occurs in social psychology beyond direct partner choice (e.g., in moral cognition) may be because of overlap between the problems of choosing new relationships and monitoring/negotiating ongoing relationships.

Our agent-based models did not allow agents to inflict harm on each other, but in the real world, people sometimes hurt each other even at personal cost (i.e., display a negative WTR). We held the means and ranges of WTR and competence constant and manipulated only their variances within and between relationships to provide a clear and conservative test of our hypotheses, but this choice likely underestimated the prioritization of WTR for two reasons. First, allowing negative WTR while maintaining the range of competence values would result in the population variance of WTR exceeding that of competence to an even greater degree (i.e., extending Figs. 1a and 1b to the right), which would likely lead to even stronger prioritization of WTR. Second, WTR and competence may in fact have different means in the natural environment. If WTRs near 0 are relatively common (as one might expect between people who have no particular relationship) and negative WTRs are possible, but competence cannot be negative (addressed below), the population mean of WTR would likely be below that of competence. If the distributions of WTR and competence differ in this way—even if their variances and domain specificity are equal—that alone could be sufficient to select for the prioritization of WTR under an information-choice cognition type. If the population mean of WTR is approximately 0, then without knowing a partner's WTR, the expected value of the relationship would be approximately 0 no matter the partner's competence (because anything times 0 equals 0). Whether the relationship would have positive or negative value would depend entirely on the partner's WTR.[3] Therefore, possible differences in the means of WTR and competence could amplify the variance-related selection pressures modeled here. This is a promising direction for future modeling work and further points to the importance of careful attention to ancestral environments, and the distributions of traits in those environments, in explaining preferences.

Although WTR can be negative by design—in fact, we argue that social cognition evolved in part to monitor this possibility—the same is likely untrue of competence (at least among adults). This is because adults who consistently produced outcomes that were not merely ineffectual but actually detrimental to fitness (e.g., repelling animals during a hunt, cooking food that sickens themselves and others) would have been unlikely to leave many copies of their genes in future generations. In other words, natural selection likely provides a floor under adult competence such that it is restricted to a positive range, whereas WTR can range negative toward particular targets by design.

An intriguing question for future research is the degree to which the prioritization of WTR over competence in social cognition is "hardwired" versus malleable. We expect the answer to be complex. By analogy, consider food preferences: Food preferences are to some degree evolved, species-typical, and inflexible (i.e., hardwired) but to some degree culturally variable (e.g., local customs regarding fermentation, spices, cooking methods, etc.; variance because of what foods are available locally), to some degree idiosyncratic, to some degree learned (e.g., people form positive or negative associations with foods, or have "acquired tastes"), and to some degree adaptively calibrated to current needs (e.g., taste preferences change across childhood and pregnancy according to changing requirements for nutrients and pathogen avoidance). As with food preferences, we expect the priority of WTR over competence to have multiple sources

of variance and flexibility, including local statistical regularities and institutions (e.g., food-sharing rules), in addition to evolved defaults and constraints. Cognitive and social styles have been shown to vary with the local environment (e.g., Schug et al., 2010; Talhelm et al., 2014), and there is a parallel between WTR and competence perceptions and collectivistic and individualistic values (Wojciszke, 1997), which suggests that recalibration of social cognition by culture or local ecology may be possible. Understanding how these factors are integrated is an important challenge for future research. For example, Kawamura and Barclay (2020) manipulated the variance of generosity and productivity among potential partners in hypothetical economic games and found that participants recalibrate their preferences, but within constraints that suggest a strong and durable preexisting prioritization of generosity. Illuminating the functional fit between preferences and relevant variance in the environment, and the mechanisms by which those preferences are calibrated to variance, will likely be a fertile field for future research across a range of preference types (e.g., mate preferences, friend preferences, employee selection; see e.g., Gangestad et al., 2006).

We have presented a new explanation for the phenomenon—widely observed across multiple domains—that people care more about other people's WTR-related traits (e.g., warmth, generosity, morality) than about their competence-related traits (agency, productivity). In contrast to existing explanations, we do not assume that WTR is intrinsically more consequential for an observer. Our argument is that differences in the distributions of these traits in the social ecologies of ancestral humans, such that WTR varied more than competence between relationship partners but less within relationships, created selection pressures that promote the prioritization of WTR in social perception. The anthropological literature suggests that these distributions were likely characteristic of human ancestral ecologies, and agent-based models demonstrate that these ecological features are likely to lead to the evolution of the prioritization of WTR. We hope that this approach will foster new advances in social psychology, evolutionary psychology, and the science of preferences.

Transparency

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Notes

1. Recent work has questioned whether perceptions of social groups spontaneously adhere to these two dimensions (Koch et al., 2016). However, the evidence that these dimensions apply to the perception of individuals appears robust.
2. "Competence" could refer to the outcomes produced by people (e.g., how much meat they bring back from a hunt) or people's traits that contribute to those outcomes (e.g., their strength and skill). It is fitness-relevant outcomes that drive natural selection for social preferences, but people cannot observe each other's future outcomes; they can observe only the traits that may predict those outcomes. Therefore, we expect individual traits to be the relevant input to social preferences but the distribution of outcomes to be most relevant to the evolutionary process.
3. We thank an anonymous reviewer for pointing out this possibility.

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