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Evolutionary Psychology Is a Scientific Revolution

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Evolutionary psychology provides a cogent meta-theory for psychological science. Historical assumptions of prior meta-theories are fatally flawed and known to be empirically incorrect. Evolutionary psychology provides a sound scientific framework for understanding human nature—one that is consilient with known causal processes of all life forms, particularly natural and sexual selection. Empirical evidence continues to accumulate for the heuristic and predictive power of the evolutionary psychology meta-theory, supporting the case for a scientific revolution in psychology.

Public Significance Statement

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Most scientists live their lives never experiencing a scientific revolution within their discipline—a seismic theoretical shift, a new paradigm that fundamentally alters how scientists view their subject matter. Astronomers experienced it during the Copernican revolution in the 1500s, which displaced the earth as the stationary center of the universe. Biologists did after 1859, when Darwin's *On the Origin of Species* unified all species into one grand tree of descent and furnished the fundamental causal process by which new species and their component adaptations are formed. As a psychologist, it is an extraordinary gift to be living and working within another rare scientific revolution. Evolutionary psychology truly is a scientific revolu-

tion, providing a fundamental paradigm shift and remains today the only cogent metatheory for understanding the complexities of the human mind and all of its multifaceted components. It is a framework that unifies psychology with the rest of the life sciences in what E. O. Wilson called consilience.

To understand why evolutionary psychology truly is a scientific revolution, it is necessary to provide a brief history the discipline of psychological science. Many trace the field to 1879 when Wilhelm Wundt founded the first psychological laboratory in Germany. Since then, different schools of thought became popular and then faded—the embrace of phenomenology, the rejection of subjective experience, and the reign of behaviorism. Behaviorism provided the most dominant metatheory the field of psychology in the 20th century until cognitive psychology and then evolutionary psychology came along. Behaviorism viewed humans as fundamentally subject to precisely the same laws of

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learning as all other organisms—classical Pavlovian conditioning and Skinnerian operant conditioning. This pan-species fundamental metatheoretical assumption explains why Skinner was able to title his 1938 treatise *The Behavior of Organisms*, a grandiose appellation, and why rats and pigeons could stand in as test subjects for humans.

The metatheoretical assumptions of behaviorism were explicit. Humans and other organisms came into the world equipped with a very small number of extremely domain-general learning mechanisms and a small number of primary reinforcers, food being the most important. Adult behavioral repertoires were solely the products of a developmental history of paired associations (e.g., a bell with food) and reinforcement contingencies (e.g., pellets after regimented forms of pecking a disk). Behaviorism contained the premise that it was unscientific to posit processes occurring within the head. External reinforcement contingencies during each individual's lifetime provided the exclusive causal explanations for manifest behavior, from pigeon pecking to adult mating behavior, and overtly expressed behavior was the only proper target for scientific study. The mind was both a blank slate on which the learning contingencies wrote the scripts and a black box that contained nothing of scientific interest or explanatory power.

These metatheoretical assumptions began to crumble in the 1960s with the work of John Garcia and others who documented behavior that violated what were presumed to be the fundamental laws of learning. Rats could learn in a single trial to avoid foods that made them nauseous 24 hr later but could not learn after hundreds of trials other paired associations such as light flashes with nausea. In 1971, Seligman introduced the notion that biological preparedness, the idea that people come into the world equipped to form some specific associations between stimuli and responses very easily and other associations only with tremendous difficulty. In 1977, Richard Herrnstein, a former student of Skinner, published an article titled "The Evolution of Behaviorism," in which he argued that humans had many drives, not few, and that primary reinforcers such as food and sex operated according to different principles (Herrnstein, 1977). Food consumption, he ar-

gued, differs fundamentally from sexual consumption. And with the cognitive revolution in the 1960s and 1970s, it became not just scientifically respectable to look inside the minds of humans, it became absolutely essential.

Unfortunately, the cognitive revolution carried over from behaviorism the core assumption of domain generality. Instead of domain-general learning processes applicable to all areas of human behavior, cognitivists posited domain-general information processes. Just as behaviorism posited no specialized learning mechanisms that might differ, say, from incest avoidance learning to food aversion learning, cognitivists posited no specialized information processing mechanisms. Just as you can program a computer to perform thousands of very different tasks, cognitivists assumed that domain-general information processors could generate thousands of different behaviors. The domain-general cognitive metatheory also failed to provide something critical to human behavior—an explanation of the specific sorts of information humans and other organisms are designed to process. Evolutionary psychology furnished the conceptual tools for filling this key gap.

Evolutionary psychology overturned problematic assumptions of prior metatheories and furnished radically different, but required, pieces of the explanatory puzzle. First, it viewed evolutionary processes not merely as optional, to be brought in only when all other causal forces failed to explain, but rather as essential for predicting and explaining human thoughts and behaviors. Second, evolutionary psychology conceives of the mind as containing a large number of specialized psychological mechanisms, each tailored to solving fundamentally different adaptive problems, in addition to whatever somewhat more domain-general mechanisms it contains. Third, identifying the adaptive functions of psychological mechanisms became indispensable—ascertaining the specific ways in which each mechanism historically led to an outcome tributary to reproductive fitness. Fourth, it dissolved the antiquated, yet still stubbornly persistent, dichotomies such as nature versus nurture and biological versus cultural and innate versus learned within a unified theoretical framework.

An example illustrates these four revolutionary contributions. We now know that hu-

mans have evolved incest-avoidance adaptations, but people do not come into the world knowing who their genetic relatives are; this information must be learned. Humans come into the world with food aversion-learning mechanisms, learning in a single trial to avoid eating food that makes them sick as much as 24 hr later, but food-learning adaptations do nothing for learning which people to avoid mating with. People do not come into the world knowing what leads to high or low status within a social hierarchy but must learn those criteria based on information provided by other people through language, social reputation, and observation of the attention structure (high-status people tend to be those to whom the most people pay the most attention).

These learning examples illustrate some of the key contributions of evolutionary psychology and clarify why neither the behaviorist nor the mainstream cognitivist paradigms can do the explanatory job. First, evolution by selection is required for explaining why these different specialized learning adaptations exist at all—they evolved to solve distinct adaptive problems. Second, it highlights why the mind contains many, not just a few, adaptive information processing mechanisms. Problems such as incest avoidance, food consumption, and negotiating status hierarchies cannot be solved with one general learning mechanism. Successful solutions to one problem such as food selection (e.g., cues to nutrient-rich and nontoxic consumption items) differ from successful solutions to other problems such as mate selection (e.g., cues to fertility) or habitat selection (e.g., cues to resource-rich environments that contain places to see without being seen—prospects and refuge). Third, understanding the adaptive function of each mechanism—the specific manner in which it contributed to survival and reproduction—is an indispensable, not an optional, endeavor. These three revolutionary shifts were entirely absent from psychological paradigms prior to evolutionary psychology.

Fourth, the examples of evolved learning adaptations illustrates why dichotomies such as learned versus innate are indeed false. Humans have evolved specialized learning mechanisms, without which particular forms of learning cannot occur. Experiencing co-

residence during development, for example, appears to be required for providing cues to genetic relatives, which is necessary for incest avoidance learning (Lieberman, Tooby, & Cosmides, 2003). So asking whether incest avoidance is learned or innate is conceptually incoherent. Evolutionary psychology dissolves the false dichotomies with a formulation of evolved psychological mechanisms as specialized information processing circuits that require input from the social, physical, or internal environments; procedures inside the head that process that input; and output in the form of manifest behavior aimed toward solving specific adaptive problems.

A Personal Journey to a Scientific Revolution of Evolutionary Psychology

I first encountered evolutionary theory in a geology class and cosmological evolution in an astronomy as an undergraduate. What fascinated me was that there existed theories to explain the origins of things—the origin and evolution of the universe, the origins and evolution of life on earth. Perhaps this had been obvious to everyone else, but it was a revelation for me. After considering majors in astronomy and geology, I settled on psychology. As fascinating as stellar evolution and plate tectonics were, the human mind fascinated me more. I wanted to understand what made people tick. I wanted to understand what motivated them to get out of bed in the morning and pursue the tasks toward which they channeled their energy. In short, I wanted to understand human nature.

As a psychology major, acquiring the body of knowledge in psychology proved informative. The field had documented many fascinating findings—the tendency of people to socially loaf or slack off in their efforts as a function of the number of people working on a task; the proclivity of people to experience a degree of self-confidence that overestimated their actual performance; cognitive biases that seemed to violate the rules of formal logic; the demonstration that people became more cruel toward others when cloaked in anonymity; and many others. Despite the profusion of interesting findings and effects, the field lacked entirely an explanation for the origins of these phenomena. Strangely, most psychol-

ogists reveled in the findings but did not seem to be interested in why they existed. Why would the mind be designed to slack off when performing group tasks or to overestimate their task performance? Moreover, psychology lacked a metatheory that could render the field coherent and unified, rather than a motley collection of interesting, but scattered, effects; a metatheory that rendered coherent including studies of vision and audition within the covers of the same introductory book that contained studies of cooperation and warfare.

The subfield of personality psychology seemed at first to offer what I was looking for. It contained grand theories of human nature—Freud’s theory of instincts and intrapsychic mechanisms, Maslow’s theory of a hierarchy of needs and self-actualization, Adler’s theory of striving to overcome feelings of inferiority, and many others. Upon studying these theories, all struck me as containing some elements that resonated intuitively. But they all seemed arbitrary, lacking a foundational set of principles by which one could adjudicate among them.

My graduate training in personality psychology did little to answer my questions, and indeed it furthered my doubts. One of my mentors, Dr. Jeanne Block, wrote papers on the origins of sex differences. She espoused the view that boys and girls did differ, but they started out identical in their psychology. Parental and cultural socialization provided the sole explanations. Parents dress their girls in pink and their boys in blue. They give girls Barbie Dolls and boys balls, bats, and trucks. Teachers rewarded girls for being submissive and obedient but rewarded boys for being aggressive and independent. The crowning achievement of Jeanne Block’s career was a science documentary that she helped script, aptly titled “The Pinks and the Blues,” in which she was featured on camera articulating her explanations for sex differences. Unstated and unclear were answers to the key question of why parents would be motivated to treat girls and boys so differently. Nor was it clear why girls and boys would be passive receptacles of parental socialization practices. Nor was it clear that the direction of effects was one directional from parents to children. Could children be influencing their par-

ents in which toys they found interesting or boring?

While being exposed to my mentor’s teachings in the mid- to late 1970s, I started reading evolutionary biology in my spare time. My most important discovery was sexual selection theory, which I first encountered in a used book I purchased, an edited volume published in 1972 commemorating the 100th anniversary of Darwin’s 1871 theory. I discovered that sex differences existed in many species, not just humans, and sexual selection theory provided a cogent and nonarbitrary explanation for their origins. The field of psychology, I realized, had no knowledge of sexual selection theory. Nor did psychology understand other powerful theories within evolutionary biology such as the theory of parent-offspring conflict, the theory of reciprocal altruism, sexual conflict theory, and the theory of inclusive fitness. Not a single graduate program in psychology required as much as a single course in evolutionary biology to obtain a PhD. Consequently, the entire field of psychology ignored a unifying framework that could provide a nonarbitrary foundation for a theory of human nature and the causal processes from which human nature originated.

Despite my fascination with evolutionary theory and its potential applicability to the human mind and behavior, my mentors proved indifferent to my interest. They tolerated my preoccupation with evolutionary biology with mild amusement but did not see its importance. So I devoted much of my graduate student effort to publishing a handful of articles in more mainstream personality psychology, enough to land a job as assistant professor at Harvard University. Once there, I felt free to study whatever I wanted with no mentors looking over my shoulder. I hit upon the idea to test predictions from Trivers’ (1972) theory of parental investment and sexual selection, George C. Williams’ (1975) predictions regarding the importance of age and reproductive value, and Donald Symons’ (1979) evolution-based theories of human sexuality.

It started as a side project more for my own curiosity rather than as my primary research focus. But once the empirical results started to roll in that supported evolution-based predictions, I felt for the first time that I was on to

something scientifically important. While at Harvard, I sought out other evolutionists who might share my interest. I sat in on lectures by Steven J. Gould; I met with E. O. Wilson, who kindly gave me a tour of his ant laboratory; I attended Irv DeVore's simian seminar; I met Martin Daly and Margo Wilson, who spent a sabbatical at Harvard and whose classic book, *Sex, Evolution, and Behavior*, proved influential in my thinking; and importantly, I met Leda Cosmides and John Tooby. They were graduate students at Harvard, she in psychology and he in bioanthropology. At that point in the early 1980s, they had published only one article—on cytoplasmic inheritance—but had not yet published anything on evolutionary psychology. The field of evolutionary psychology simply did not exist.

After 4 years at Harvard, a key opportunity came my way—the University of Michigan offered me a tenured position as associate professor in 1985. With the job security that tenure provided, I was totally free to begin publishing what I suspected would be controversial work—sex differences in human mate preferences, tested in 37 cultures, predicted in advance by evolution-based hypotheses (Buss, 1989b). This work cascaded into a florescence of research projects that proved the first of their kind—the first studies of human mate-retention tactics (Buss, 1988a), tactics of attraction (Buss, 1988b), derogation of competitors (Buss & Dedden, 1990), mate-poaching tactics (Schmitt & Buss, 2001), conflict between the sexes (Buss, 1989a), sex differences in jealousy (Buss, Larsen, Westen, & Semmelroth, 1992), and others.

Simultaneously, Leda Cosmides and John Tooby began to publish their seminal works—developing the conceptual foundations of evolutionary psychology by integrating principles of evolutionary biology with cognitive principles of adaptations as information-processing devices, and illustrating those foundations with a program of experimental work on social contract theory, with special attention to a hypothesized cheater-detection mechanism (e.g., Cosmides, 1989; Cosmides & Tooby, 1987, 1992; Tooby & Cosmides, 1990, 1992). Their theoretical work on the conceptual foundations had a profound influence on my thinking. They integrated the notion of the mind as a collection of information processing circuits with the edifice

of evolutionary theory. I realized that my work on human-mating psychology was just one example of a broader scientific revolution in the making.

The Big Question: When Will the Field Accept Evolutionary Psychology as a Metatheory?

In my experience, the hard hand of empirical studies, from observations to experiments, compels psychologists more than conceptual arguments. Research on human mating psychology turned out to be a pivotal success story within this new science of the mind. Psychologists are trained to be empirical scientists first and foremost. They tend to be convinced by data and findings. Some of my psychology colleagues view any theory with great skepticism, and some see no need for theory at all. The large empirical body of findings about human mating, combined with groundbreaking work by Cosmides and Tooby on social contract theory and similarly groundbreaking work on social conflict within families by Martin Daly and Margo Wilson, however, proved impossible to ignore. Since those early days, impressive scientific knowledge has accrued around the behavioral immune system, the evolution of emotions ranging from envy to sexual disgust, the evolution of cooperation, the evolution of aggression, kin psychology, and many others. The empirical edifice has expanded dramatically over the past three decades and continues to grow stronger every month. In each domain of study, with each empirical success, evolutionary psychology became impossible to ignore.

Like all scientific revolutions, evolutionary psychology experienced, and continues to experience, vigorous opposition. Some attacked specific empirical findings. Some argued that the findings could be explained with nonevolutionary accounts. Regarding my own work, some proposed, after the findings had been published, that sex differences in mate preferences, for example, could be explained by social role theory, whereby men and women were assigned different roles by society, with men assigned the bread-winning role and women assigned the nurturing role. Precisely

who was doing the assigning was never made clear. Nor was it clear why women and men would passively adopt whatever roles they were assigned. Nor could social role theory explain why men valued physical attractiveness more than women, why men preferred younger mates and women older mates, or why standards of female attractiveness corresponded so closely to cues of fertility and standards of male attractiveness corresponded more closely to cues to social status and protective prowess.

Despite these explanatory gaps, social role theory could be applauded for generating one very specific prediction: As cultures become more gender egalitarian, sex differences should shrink. This pivotal prediction now has been overwhelmingly refuted. Several massive cross-cultural studies, conducted by different teams of researchers, show the counterintuitive finding that psychological sex differences tend to get larger in gender egalitarian cultures, not smaller (e.g., Schmitt et al., 2017; Lippa, 2010; Walter et al., 2020). Despite these refutations, many mainstream psychologists cling to social role theory and reject the evolutionary hypotheses that predicted the sex differences well in advance of the empirical tests.

In addition to attacks on specific empirical findings discovered by evolutionary psychologists, which of course are fair game and good for scientific progress, others have attacked the conceptual foundations of the evolutionary psychology metatheory. A nontrivial number of these attacks are based on outright misunderstandings of the logic of evolutionary theory itself; recall that psychologists receive no training in evolutionary biology, so it is perhaps not surprising that most do not understand it. These misunderstandings have been repeatedly pointed out elsewhere (e.g., Al-Shawaf, Zreik, & Buss, 2018; Confer et al., 2010; Lewis, Al-Shawaf, Conroy-Beam, Asao, & Buss, 2017; Park, 2007; Winegard, Winegard, & Deaner, 2014).

Misunderstandings about evolutionary psychology include: (a) confusions about ultimate versus proximate explanation; (b) the false accusation of genetic determinism; (c) adhering to antiquated dichotomies such as nature versus nurture; (d) misconstruals about the logic of the concept of the environment of evolutionary

adaptedness (it is not a time or place, as some believe, but rather a statistical aggregate of selection pressures specific to each adaptation); (e) the false claim that evolutionary psychological hypotheses are unfalsifiable (e.g., several have been falsified already; see Confer et al., 2010); and others. Many critics do not seem motivated to conduct enough proper scholarship to accurately depict a metatheory they seem highly motivated to reject. It has become apparent that some of the motivated rejection is based on ideology (e.g., Buss & von Hippel, 2018; Von Hippel & Buss, 2017). I have argued that humans have not evolved to be dispassionate scientists. Our evolved psychology, including tribal coalitionary psychology, motivated reasoning, and intuitive theories of mind, ironically, interfere with our ability to understand our evolved psychology.

Some attacks on evolutionary psychology, however, are based in legitimate scientific disagreements. Perhaps the most important is the claim that domain-general processes, not specialized adaptations, can adequately human behavior (e.g., Heyes, 2018). This goes to the heart of the evolutionary psychology metatheory. If evolution by selection has indeed created solely domain-general mechanisms, either of the sort posited by behaviorists, associationists, or cognitivists, then science could simply acknowledge this fact and then proceed to ignore evolutionary theory. It is only if evolution by selection has created more specialized psychological adaptations whose adaptive functions are to solve particular survival and reproductive challenges and not others that the evolutionary psychology metatheory becomes compelling. There is room, of course, for legitimate scientific disagreement, and some adaptations are indeed somewhat more domain general than others.

In my view, though, enough evidence has cumulated in the domains of mating psychology; sexual attraction; cooperation; kin altruism; the emotions of love, anger, disgust, shame, pride, and envy; and evolved standards of morality—findings that domain-general accounts neither predict nor explain—that the evolutionary psychology metatheory has borne out its empirical promise. As this empirical mountain of evidence continues to accumulate, it is my hope that psychologists will embrace

the revolutionary paradigm shift provided by evolutionary psychology.

References

- Al-Shawaf, L., Zreik, K., & Buss, D. M. (2018). Thirteen misunderstandings about natural selection. In T. Shackelford & V. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science* (pp. 1–14). Cham, Switzerland: Springer Cham. http://dx.doi.org/10.1007/978-3-319-16999-6_2158-1
- Buss, D. M. (1988a). From vigilance to violence: Tactics of mate retention in American undergraduates. *Ethology and Sociobiology*, *9*, 291–317. [http://dx.doi.org/10.1016/0162-3095\(88\)90010-6](http://dx.doi.org/10.1016/0162-3095(88)90010-6)
- Buss, D. M. (1988b). The evolution of human intra-sexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology*, *54*, 616–628. <http://dx.doi.org/10.1037/0022-3514.54.4.616>
- Buss, D. M. (1989a). Conflict between the sexes: Strategic interference and the evocation of anger and upset. *Journal of Personality and Social Psychology*, *56*, 735–747. <http://dx.doi.org/10.1037/0022-3514.56.5.735>
- Buss, D. M. (1989b). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, *12*, 1–14. <http://dx.doi.org/10.1017/S0140525X00023992>
- Buss, D. M., & Dedden, L. A. (1990). Derogation of competitors. *Journal of Social and Personal Relationships*, *7*, 395–422. <http://dx.doi.org/10.1177/0265407590073006>
- Buss, D. M., Larsen, R. J., Westen, D., & Semmelroth, J. (1992). Sex differences in jealousy: Evolution, physiology, and psychology. *Psychological Science*, *3*, 251–256. <http://dx.doi.org/10.1111/j.1467-9280.1992.tb00038.x>
- Buss, D. M., & von Hippel, W. (2018). Psychological barriers to evolutionary psychology: Ideological bias and coalitional adaptations. *Archives of Scientific Psychology*, *6*, 148–158. <http://dx.doi.org/10.1037/arc0000049>
- Confer, J. C., Easton, J. A., Fleischman, D. S., Goetz, C. D., Lewis, D. M., Perilloux, C., & Buss, D. M. (2010). Evolutionary psychology: Controversies, questions, prospects, and limitations. *American Psychologist*, *65*, 110–126. <http://dx.doi.org/10.1037/a0018413>
- Cosmides, L. (1989). The logic of social exchange: Has natural selection shaped how humans reason? Studies with the Wason selection task. *Cognition*, *31*, 187–276. [http://dx.doi.org/10.1016/0010-0277\(89\)90023-1](http://dx.doi.org/10.1016/0010-0277(89)90023-1)
- Cosmides, L., & Tooby, J. (1987). From evolution to behavior: Evolutionary psychology as the missing link. In J. Dupre (Ed.), *Essays on evolution and optimality* (pp. 276–306). Cambridge, MA: MIT Press.
- Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 163–228). New York, NY: Oxford University Press.
- Herrnstein, R. J. (1977). The evolution of behaviorism. *American Psychologist*, *32*, 593–603. <http://dx.doi.org/10.1037/0003-066X.32.8.593>
- Heyes, C. (2018). *Cognitive gadgets: The cultural evolution of thinking*. Cambridge, MA: Harvard University Press. <http://dx.doi.org/10.4159/9780674985155>
- Lewis, D. M. G., Al-Shawaf, L., Conroy-Beam, D., Asao, K., & Buss, D. M. (2017). Evolutionary psychology: A how-to guide. *American Psychologist*, *72*, 353–373. <http://dx.doi.org/10.1037/a0040409>
- Lieberman, D., Tooby, J., & Cosmides, L. (2003). Does morality have a biological basis? An empirical test of the factors governing moral sentiments relating to incest. *Proceedings of the Royal Society of London, Series B: Biological Sciences*, *270*, 819–826. <http://dx.doi.org/10.1098/rspb.2002.2290>
- Lippa, R. A. (2010). Gender differences in personality and interests: When, where, and why? *Social and Personality Psychology Compass*, *4*, 1098–1110. <http://dx.doi.org/10.1111/j.1751-9004.2010.00320.x>
- Park, J. H. (2007). Persistent misunderstandings of inclusive fitness and kin selection: Their ubiquitous appearance in social psychology textbooks. *Evolutionary Psychology*, *5*, 147470490700500414. <http://dx.doi.org/10.1177/147470490700500414>
- Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: Tactics and temptations for infiltrating existing mateships. *Journal of Personality and Social Psychology*, *80*, 894–917. <http://dx.doi.org/10.1037/0022-3514.80.6.894>
- Schmitt, D. P., Long, A. E., McPhearson, A., O'Brien, K., Remmert, B., & Shah, S. H. (2017). Personality and gender differences in global perspective. *International Journal of Psychology*, *52*(Suppl. 1), 45–56. <http://dx.doi.org/10.1002/ijop.12265>
- Symons, D. (1979). *The evolution of human sexuality*. New York, NY: Oxford University Press.
- Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology*, *11*, 375–424. [http://dx.doi.org/10.1016/0162-3095\(90\)90017-Z](http://dx.doi.org/10.1016/0162-3095(90)90017-Z)
- Tooby, J., & Cosmides, L. (1992). The psychological

- foundations of culture. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 19–136). New York, NY: Oxford University Press.
- Trivers, R. (1972). Parental investment and sexual selection. In B. G. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Chicago, IL: Aldine.
- Von Hippel, W., & Buss, D. M. (2017). Do ideologically driven scientific agendas impede the understanding and acceptance of evolutionary principles in social psychology? In J. T. Crawford & L. Jussim (Eds.), *Politics of Social Psychology* (pp. 17–35). New York, NY: Psychology Press. <http://dx.doi.org/10.4324/9781315112619-2>
- Walter, K. V., Conroy-Beam, D., Buss, D. M., Asao, K., Sorokowska, A., Sorokowski, P., . . . Zupančič, M. (2020). Sex differences in mate preferences cross 45 countries: A large-scale replication. *Psychological Science*, 956797620904154.
- Williams, G. C. (1975). *Sex and evolution* (No. 8). Princeton, NJ: Princeton University Press.
- Winegard, B. M., Winegard, B. M., & Deaner, R. O. (2014). Misrepresentations of evolutionary psychology in sex and gender textbooks. *Evolutionary Psychology*, 12, 474–508. <http://dx.doi.org/10.1177/147470491401200301>

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