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Adaptive workarounds

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Adaptive workarounds are recently evolved features that function to mitigate or manage some maladaptive element of a pre-existing adaptation. This article discusses three adaptive workarounds in the human mating repertoire. First, a strong attachment bond between adult mating partners may mute or refocus older features (e.g. testosterone in men, ovulatory shifts in women) in a manner that protects and preserves the pair-bond. Second, humans' ability to identify a stranger as an ingroup or an outgroup member moderates the function of ovulatory shifts. Third, self-control enables people to inhibit evolutionarily older impulses in cases where those impulses could disrupt pair-bonds or thwart long-term goals. Information about the time course of human evolution (i.e. phylogeny) can generate new insights about human mating.

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The field of evolutionary psychology draws from evolutionary biological principles to develop and test hypotheses about the form and function of the human mind. One such principle is *adaptation*, which refers to a feature of an organism that emerged via natural selection because it enhanced reproductive success. For example, if a man encounters a young, attractive woman, adaptations in his mind might trigger feelings of attraction, which could subsequently inspire him to attempt to initiate a romantic or sexual relationship with her. Evolutionary psychologists argue that the human mind contains many mental adaptations, each designed to produce thoughts, feelings, or behaviors that would have been functional in humans' evolutionary past [1,2].

In a given context, more than one mental adaptation may be relevant for guiding behavior, and sometimes the functions of these adaptations work at cross-purposes [3]. The mind must somehow resolve these conflicts: For example, a man might possess mental adaptations designed to maintain his devotion and commitment to an existing long-term partner, eliminating the behaviors he would otherwise have enacted in the presence of a young, attractive woman [4]. Broadly speaking, adaptations designed to facilitate mating may not exhibit their typical effects — or they might even exhibit new effects — under particular circumstances where conflicts between adaptations arise.

The *adaptive workaround* is a concept that may help scholars to generate *a priori* predictions about how conflicts between different mating-relevant adaptations will be resolved. Also borrowed from the evolutionary biological literature, adaptive workarounds are features that evolved relatively recently in an organism's evolutionary history and function to mitigate or manage some maladaptive element of a pre-existing adaptation [5]. Adaptive workarounds arise because older features of organisms are sometimes resistant to selection and serve as sources of evolutionary constraint [6–8]. For example, the transition to bipedalism among hominids narrowed the birth canal and therefore placed a constraint on these organisms' cranial capacity. Natural selection produced an adaptive workaround to evade this constraint: Early Homo experienced a shift in the timing of infant development such that a greater proportion of cranial growth took place after birth rather than prenatally. This shift allowed early Homo to grow large adult brains without compromising the ability of newborn heads to fit through the narrow birth canal [9].

In order for scholars to make reasonable inferences about which adaptations might serve as adaptive workarounds, they must draw from an existing knowledge base about how the features of an organism have changed over evolutionary time (i.e. phylogeny). For psychologists, generating hypotheses about adaptive workarounds thus requires knowledge of how the human mind has evolved over time. Although our understanding of the psychology of early hominids is far from complete, archeological, anthropological, and comparative biological approaches may reveal clues about the psychology of these species and can thereby guide hypotheses about the modern human mind [5,10–13].

Importantly, the adaptive workaround concept predicts that when a more recent psychological adaptation is activated in a given context, the effect of a previously evolved, conflicting adaptation may be muted (i.e. it may be reduced or eliminated) or refocused (i.e. it may be rechanneled to have a different adaptive function). The current article describes recent evidence for adaptive

workarounds in the domain of human mating. Although this literature is in its infancy, there is growing evidence that three adaptations that emerged relatively recently within the hominid lineage (i.e. less than two million years ago) have adaptive workaround-like properties: Attachment bonds (i.e. pair-bonds) between romantic partners, the ability to categorize unknown others as ingroup versus outgroup members, and the use of self-control to facilitate the pursuit of future goals.

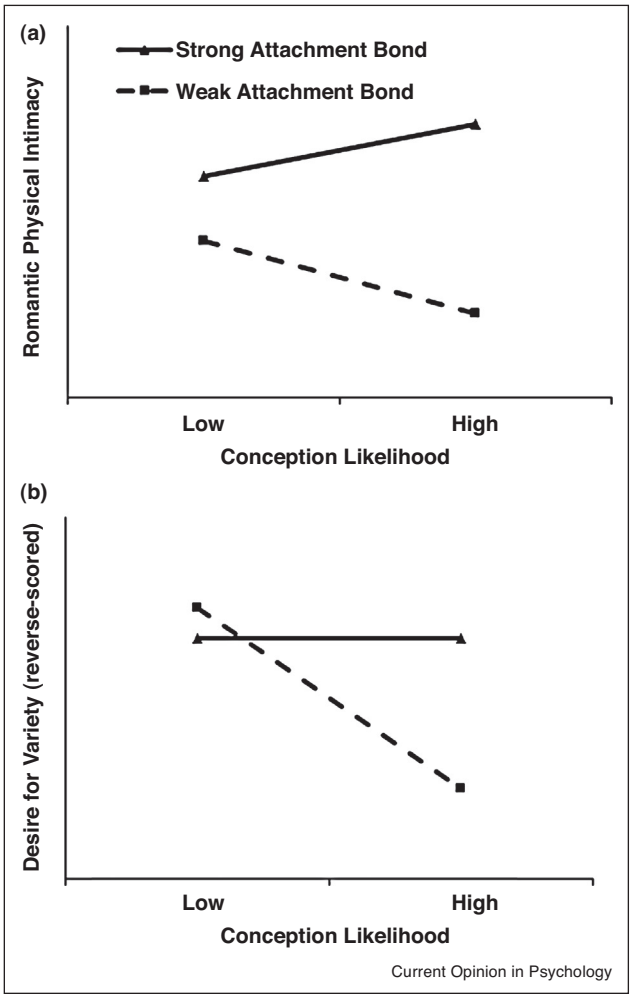
Attachment bonds as adaptive workaround

Attachment bonds (i.e. pair-bonds) between adult mating partners likely first emerged in the hominid lineage between 1.5 and 2 million years ago, a period of time when sexual dimorphism decreased and infants required considerable investments in the form of calories and caregiving [14,15]. Attachment bonds would have increased reproductive success in early Homo by promoting intersexual cooperation and encouraging paternal investment in offspring [16•,17]. Yet despite ongoing selection pressures for pair-bonding, these same early hominids would have already possessed many mental adaptations that served functions related to mating effort. For example, both male and female Homo would have been drawn to attractive opposite-sex partners, and like other primates, they possessed sex hormones (e.g. testosterone, estrogen) that facilitated mating behavior. Thus, the evolution of pair-bonding set the stage for possible conflicts between older adaptations designed to identify and acquire mates and newer adaptations designed to maintain the pair-bond [5].

If the attachment bond functions as an adaptive workaround, then features associated with pair-bonding should mute or refocus previously evolved mating-effort adaptations. One example may be that the pair-bond decreases the presence of circulating testosterone in men. Testosterone is linked to intrasexual competition and the pursuit of new mating partners, and it may disrupt effective caregiving and nurturing behavior [18–20]. Thus, high levels of testosterone should be adaptive for men who are attempting to acquire mates but might be maladaptive among men who are pair-bonded. Consistent with this hypothesis, men who are involved in a committed romantic relationship have lower testosterone than unpaired men [21–24], and this decline in testosterone has been documented longitudinally as men make the transition into marriage and fatherhood [25].

Attachment bonds may also function as adaptive workarounds with respect to shifts in women's sexual interests across the ovulatory cycle. On average, women are especially likely to desire men with features that indicate genetic fitness (e.g. dominance, masculinity) when they are in the fertile phase of their menstrual cycle [26]. If these desires encouraged women to have sex with men who were not their primary partners, however, these desires could have been maladaptive in the context of a strong pair-bond. Two studies suggested that strong attachment bonds rechannel ovulatory shifts to inspire women's desire for intimacy-promoting sexual contact with their current partners [27••]. In these studies (Figure 1, panel a), attachment bond strength was assessed as the extent to which the woman reported that her male partner exhibited several attachment-related features and functions (e.g. safe haven, separation distress; [28]). Women with weak pair-bonds were less likely to desire romantic physical intimacy with their partner in the fertile than the nonfertile phase of their cycle (see also [29]). Yet consistent with the adaptive workaround logic, women with strong pair bonds were *more* likely to desire romantic physical intimacy with their partner in the fertile than the nonfertile phase of their cycle. It is possible that

Figure 1



Patterns of data illustrating the Attachment Bond Strength × Conception Likelihood interaction on the desire for romantic physical intimacy ([27••], Studies 1 and 2) and desire for variety ([31••], Studies 2 and 4). Results are combined across the two relevant studies within both articles.