

a younger age and were more likely to have a second child than women with less contact with kin. This suggests that, indeed, being around the family promotes behaviors, norms, and ideas that support fertility and heteronormative behavior. Kin-based societies will maintain norms that discourage homosexual behavior. Newson and Richerson (this issue) provide a validated model suggesting that, on a cultural scale, the rapid rise of acceptance and tolerance of homosexual behavior is localized mostly to Western societies (which tend to be more economically developed and less kin-focused).

### **Evolutionary Mismatch and Cultural Evolution**

We can explain these phenomena in terms of evolutionary mismatch (see Wilson, 2007). In short, this idea suggests that when modern conditions mismatch ancestral conditions that typified contexts under which humans evolved, behavior may well change also. Under ancestral human conditions, familial bonds were the basis of all social structures. These days, in economically developed regions, social structures are based on a larger variety of pillars than just familial bonds. Such mismatched conditions may lead, as Newson and Richerson (this issue) point out, to cultural norms that bear less on reproductive success than norms that were likely found under ancestral conditions. Changes in norms regarding non-heteronormative behavior in Westernized contexts seem to be exactly the kinds of norms that result from changes in social structures that do match our ancestral human environments.

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## **Kin-Influence and Homosexuality: Further Theoretical Considerations**

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### **Kin Influence and Homosexuality: Further Theoretical Considerations**

Newson and Richerson have previously proposed that modernity includes the degradation of the family as the central social unit in humans (Newson & Richerson, 2009). They argue that economic and population growth reduce incentives to adhere to family institutions such as marriage, parenthood, familial care, and nepotism. In this way, modernity may reduce kin investment and interference, hereafter referred to as “kin influence.” In the target article, Newson and Richerson elaborate on one additional consequence of this proposed trend: the broad social tolerance for homosexual identities. They argue that modern, inertial reduction in kin influence decreases the prioritization of reproduction. This means that exclusive homosexuality conflicts less with family institutions and social values as those values become less contingent on reproduction and family-building. But here arises the topic of our response. What is the proposed se-

quence of cultural evolutionary events regarding the presence of homosexual orientations, reductions in kin influence, and tolerance for homosexuality?

### **Terminology**

First, to think clearly about this topic, it is necessary to differentiate homosexual attractions, homosexual orientations, and homosexual identities. Sexual attractions are contextual arousal responses to the stimuli of one sex or another and are not necessarily indicative of orientations, which are a description of typical responses to a range of sexual stimuli which can favor one sex, favor neither sex (in the case of bisexuality), or be absent (in the case of asexuality). Sexual identities in contrast, represent a categorical, cultural interpretation of sexual orientations, dividing individuals into self-selected sexual labels that are not necessarily indicative of sexual orientation. Sexual identities are neither timeless nor universal cultural entities; non-Western and pre-modern cultures can have very different cultural institutions surrounding sexuality (e.g., the fa'afafine of Samoa, the Kathoey of Thailand, the Hijra of India, and the Berdache of Native America).

In developing their line of research, Newson's and Richerson's arguments may benefit from clear reference to sexual attractions, orientations, and identities. For example, it seems more relevant to the kin influence hypothesis that homosexual orientations lack attraction to the opposite sex than that they experience attraction to the same sex. Likewise, it seems more relevant that homosexual identities de-emphasize opposite-sex attractions than that they emphasize same-sex attractions. It is the failure of offspring to seek or attract reproductive opportunities that should be discouraged by kin influence, not necessarily their seeking or attracting of same-sex partners. Homosexually-identified individuals are capable of reproduction (e.g., about half of Western homosexual men report significant heterosexual relationships in their lifetime; 56%, Rosario, et al., 1996; 54%, Savin-Williams, 1990; 64%, Whisman, 1996), but have lower fecundity in modern cultures. Exclusive homosexuality, on the other hand, is a term we reserve for individuals who experience no attraction towards or are repulsed by the opposite sex. In our response, we refer only to exclusive homosexuals, as these are the individuals who constitute the greatest reproductive threat to their kin.

### **Interpretations**

We have identified three interpretations of Newson's and Richerson's theoretical argument, and briefly assess the merits of each. In each interpretation, we sketch a timeline for the interaction between kin influence, exclusive sexual orientations, and tolerance for homosexuality. For the sake of argument, we grant that kin-influence is decreasing as a result of modern social and economic forces. The root of our confusion regards whether, prior to modernity, kin influence was an effective "treatment" against non-reproductive, exclusively homosexual offspring. If not, i.e., if exclusive homosexuals have existed over human evolutionary history unaffected by kin influence, then why did this form of kin influence evolve? If it had been effective, we perceive certain theoretical concerns. We focus on these theoretical concerns, leaving it to others to assess the methodological merits of this particular pair of studies.

#### **Kin-Influence First**

Our first interpretation is that reductions in kin influence have produced exclusive homosexuality, *de novo*, in recorded history. It is possible that, for some individuals, the development of reproductive attractions requires some level of kin influence that, when lacking, produces exclusively homosexual adolescents and adults. This is not an unreasonable proposition, but it runs counter to observations of fixed and heritable sexual orientations. Non-human sexuality is marked by reproductive bisexuality in almost every species in which same-sex behavior is observed (Bagemihl, 1999). It could be that the uniquely modern degradation of the human family environment described by the kin influence hypothesis has precipitated

the appearance of exclusive homosexuals by removing inputs that guide offspring towards reproduction. Following this “invention” of exclusive homosexuality, attitudes towards homosexuals may have been negative initially but improved as kin influence continued to diminish. Challenges to this interpretation include the observation that apparently exclusive homosexuality predates modern social conditions (Parkinson, 1995), that there are biological developmental predictors of homosexuality observed across cultures (Whitam, 1983), and that sexual “conversion” (changing one’s sexual orientation) is unsubstantiated (APA, 2009).

### **Orientation First**

A more straightforward interpretation is that improved attitudes towards a pre-existing expression of exclusive homosexuality have arisen by virtue of reduced kin influence, leaving homosexuality relatively unchanged. This implies that, for most of human history, exclusive homosexuals suffered at the hands of kin who would try, in vain, to drive them towards reproductive behavior. Challenges to this interpretation include differences in the expressions of homosexuality and the degree of exclusivity across cultures (Vasey, Parker, & VanderLaan, 2014), as well as the impacts that peer environments and sexual experiences have on the development of exclusive homosexuality (e.g., Rivers, 2001). Again, in this scenario, one wonders why ineffectual kin influence on sexuality evolved in the first place, genetically or culturally. For this interpretation to work, Newson and Richerson would need to argue that culturally evolved, ineffectual anti-gay attitudes are so novel that they have not yet been selected out of human cultures, or that anti-gay attitudes are not related to kin influence or serve a function (or are a byproduct of a function) other than encouraging reproduction in kin.

### **Simultaneity**

Another interpretation of Newson and Richerson is that exclusive homosexual orientations and tolerance for homosexual identities either coevolved, meaning that they are interacting products of reduced kin influence, or independently evolved as non-interacting products of reduced kin influence. One can imagine the gradual de-emphasis of the kin group promoting the development of exclusive homosexuality while simultaneously promoting tolerance for exclusive homosexuals. Whether homosexual tolerance and the exclusivity of homosexual expression interact across history is worth investigating (i.e., whether cultural coevolution has occurred or is occurring). For example, it is possible that improving perceptions of exclusive homosexuals facilitates greater expression of exclusive homosexuality which, in turn, contributes to more positive perceptions of exclusive homosexuals.

### **Conclusion**

Whatever interpretation Newson and Richerson would endorse, it will need to be spelled out in a way that resolves the conflict between the ancestral function of kin influence as a promoter of reproduction and the universal, biological, and relatively fixed nature of exclusive homosexuality. Newson and Richerson may argue that coercive parents are enough to push otherwise exclusive homosexuals into relationships with the opposite sex (e.g., the “homowives” phenomenon in China), but prior to modern sexual pharmaceuticals, techniques, and stimuli, it is not clear how an exclusively homosexual (man, at least) would accomplish reproduction. Whereas the kin influence hypothesis is compelling on many fronts (see Newson & Richerson, 2009), and the data presented in the target article lend some credence to the argument, we await a more furnished theoretical rationale for the evolutionary process proposed by Newson and Richerson.

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## The co-evolution of nativist beliefs and tolerant attitudes

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The paper by Newson and Richerson once again shows that theories of cultural evolution can throw a genuinely original light on the important societal changes of our time. We are therefore very curious to know how Newson and Richerson conceive of the relation between their hypothesis and other recent work on the cultural evolution of liberal and conservative values (see for example Acerbi, Enquist & Ghirlanda 2009 and Eriksson & Strimling 2015). That said, we will concentrate on another issue, namely how the changes in attitudes towards homosexuality go hand in hand with changes in our beliefs about the etiology and nature of homosexuality. Newson and Richerson already hint at this topic in their paper when they write:

“More discussion of homosexuality encouraged scientists to look for biological factors that may cause some people to have a same sex sexual orientation (LeVay, 1996). Their speculation was widely covered by the media and the suggestion that some people were innately homosexual (and therefore had no choice about whom to love) became, for many Westerners, justification for supporting what became the LGBT movement (Lewis, 2009).”

In this statement Newson and Richerson elaborate on Herek's cultural evolutionary theory according to which societal changes in homonegativity are due to the introduction of the concept of ‘homophobia’ and the recognition by psychiatrists that homosexuality is not a disorder. They suggest that in addition to this information, it was new information about the etiology of homosexuality that has resulted in increased tolerance towards homosexuality in the West. Social-psychological research on anti-homosexual prejudice has revealed that there is indeed such a negative correlation between essentialist beliefs about homosexuality and homonegativity (Haider-Markel & Joslyn 2008). Yet this result is more surprising than it might seem at first sight.

Much of the social-psychological research that aims to get a grip on how homonegativity co-varies with personality traits, ecological variables, education and beliefs, is inspired by research on racism and sexism. Indeed, homonegativity seems to have many correlates in common with sexism and racism (Altemeyer 2002). One curious exception is the positive correlation between sexism/racism and psychological essentialism. Whereas racism and sexism seem to be strongly linked with psychological essentialism