

# The Westermarck Hypothesis and the Israeli Kibbutzim: Reconciling Contrasting Evidence

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**Abstract** The case of the communal education system in the Israeli kibbutzim is often considered to provide conclusive support for Westermarck's (1891) assertion regarding the existence of evolutionary inbreeding avoidance mechanisms in humans. However, recent studies that have gone back to the kibbutzim seem to provide contrasting evidence and reopen the discussion regarding the case of the kibbutzim and inbreeding avoidance more generally (Lieberman & Lobel, 2012; Shor & Simchai, 2009). In this article, I reassess the case of the kibbutzim, reevaluating the findings and conclusions of these recent research endeavors. I argue that the differences between recent research reports largely result from conceptual and methodological differences and that, in fact, these studies provide insights that are more similar than first meets the eye. I also suggest that we must reexamine the common assumption that the kibbutzim serve as an ideal natural experiment for examining the sources of incest avoidance and the incest taboo. Finally, I discuss the implications of these studies to the longstanding debate over the Westermarck hypothesis and call for a synthetic theoretical framework that produces more precise predictions and more rigorous empirical research designs.

**Keywords** Incest taboo · Sexuality · Inbreeding avoidance · Westermarck · Kibbutzim · Israel

## Introduction

The years-long debate over the origins of incest avoidance and the incest taboo continues to attract scholarly attention. Most scholars believe that Westermarck (1891) was correct in suggesting that early childhood propinquity leads to sexual aversion later on in life and that this is the primary reason for both incest avoidance and the incest taboo (Erickson, 1989, 1993; Fessler & Navarrete, 2004; Kushnick & Fessler, 2011; Lieberman, 2009; Lieberman & Lobel, 2012; Lieberman & Symons, 1998; Schneider & Lewellyn, 2000; Wolf, 1993; Wolf & Durham, 2005). However, challenges to this view and to the evidence presented for it continue (e.g., El Guindi & Read, 2012; Leavitt, 2005, 2007; Leiber, 2006; Shor & Simchai, 2009).

In this article, I reexamine one of the most well cited and talked about cases presented as evidence for the Westermarck hypothesis, the case of Israeli kibbutzim. More specifically, I revisit the findings of two recent studies on the kibbutzim, which, at least seemingly, present contrasting evidence. First, Shor and Simchai (2009) conducted interviews with kibbutz-reared peers, concluding that, in opposition to what Westermarck suggested, many of them felt attraction toward same-age peers while growing up and almost none of them reported any feelings of sexual aversion toward peers. In contrast, Lieberman and Lobel (2012) conducted surveys among kibbutz-reared peers, concluding that, in accordance with the Westermarck hypothesis, these individuals developed an aversion toward sexual relationships with peers.

I reevaluate the methodology, assumptions, and conclusions of both studies, and argue that, in fact, the main insights we may draw from them are more similar than it may first appear. I further suggest that the findings of both studies pose an important challenge to conservative evolutionary approaches to incest avoidance. There seems to be no evidence that simply growing up together was enough to create sexual aversion or eliminate sexual

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attraction among peers. Furthermore, feelings toward sexual relations with a sibling were much more negative than those associated with peer sexuality, despite the fact that peers saw much more of one another than siblings. This finding stands in contrast to Westermarck's assertion that the proximity and intensity of the association (rather than a social script) are the crucial elements in producing sexual aversion.

Next, I compare the case of the kibbutzim with other prominent natural experiments that claim to test Westermarck's hypothesis, most notably, Wolf's (1966, 1970) study on Taiwanese minor marriages. I propose that we must reexamine the common assumption that the kibbutzim serve as an ideal case study (the perfect natural experiment) for examining the sources of incest avoidance and the incest taboo, although I also note the disadvantages of using other natural experiments. I end with a short discussion of the reasons behind the continuous gap in research findings and writings on incest aversion and offer some directions for moving forward, including the adoption of a synthetic theoretical framework and the need for more precise predictions and more rigorous empirical research designs.

## The Westermarck Hypothesis and the Israeli Kibbutzim

Westermarck (1891) proposed that "there is an innate aversion to sexual intercourse between persons living very closely together from early childhood" (p. 320). Westermarck further suggested that this innate aversion is the direct cause for the existence of an incest taboo in virtually all human societies, as the moral disapproval of the act turns into laws and prohibitions of intercourse between near kin. Westermarck's ideas were first dismissed by some of the leading social scientists of the early twentieth century (Freud, 1950 [1913]; Lévi-Strauss, 1969 [1949]; Murdock, 1949; Parsons, 1954; Sahlins, 1960; White, 1948). However, beginning in the late 1960s, a growing number of biologists, sociobiologists, evolutionary psychologists, and anthropologists began to present research results and arguments in support of the Westermarck hypothesis (Bischof, 1972, 1975; Bixler, 1981; Bvec & Silverman, 1993, 2000; Erickson, 1989, 1993; Fessler, 2007; Fessler & Navarrete, 2004; Fox, 1980; Kushnick & Fessler, 2012; Lieberman, 2006, 2009; Lieberman & Lobel, 2012; Lieberman & Symons, 1998; Lieberman, Tooby, & Cosmides, 2007; Shepher, 1971, 1983; Wolf, 1966, 1968, 1970, 1993, 2005b).

Despite important critiques (Graber, 1984; Kopytoff, 1984; Leavitt, 1990, 2005, 2007; Leiber, 2006; Read, 2014; Shor & Simchai, 2009), this flux of scholarly work has led some to declare that "Westermarck was proved right... [and] enters the twenty-first century as almost the only man worth mentioning" (Wolf, 2005a, p. 10). In fact, as Leavitt (2005, 2007) noted, many Darwinian social scientists have come to regard the Westermarck hypothesis as an indisputable truth and as part of Western wisdom. For many,

the Westermarck effect serves not only as the ultimate demonstration for the viability of natural selection theory in explaining human behavior, but also as testimony for the folly of cultural and social explanations in this field.

The writings of leading evolutionary scholars and sociobiologists echo this sentiment. For example, Maynard Smith (1978) wrote: "Ten years ago, I regarded incest avoidance as an entirely cultural phenomenon; only a bigot could hold this view today" (p. 121). Dawkins (1983) echoed this sentiment, stating that "I usually resist the temptation to indulge in simple 'selfish gene' explanations of the social behavior of humans... Inbreeding avoidance is the one case for which I feel reasonably confident. 'The social orthodoxy' has always seemed to me particularly daft in this area" (pp. 105–106). More recently, Lieberman and Symons (1998) declared that the proposition that early cohabitation leads to sexual aversion "must be fairly obvious to anyone who has not been indoctrinated with the crippling dogmas of Freudianism or the social sciences" (p. 73). Similarly, Wolf (2005b) argued that "we avoid incest for natural, not cultural reasons" (p. 21). Contemporary scholars conclude that the issue of incest avoidance has become "the critical case for evaluating theoretical aspirations of sociobiology and evolutionary psychology" (Sesardic, 2005, p. 110), serving as a "showcase of new Darwinian approaches to human behavior" (Durham, 2005, p. 121).

## The Israeli Kibbutzim as Evidence for the Westermarck Effect

One of the most salient case studies on which these statements and sentiments are predicated is that of the Israeli kibbutzim. The kibbutzim seem to provide an ideal setting (or what some have called a "natural experiment") for testing the Westermarck hypothesis. Until the early 1980s, most of them had a communal education system, where children from the same age group were socialized together in one house (*beit yeladim*). Peers spent most of their days together in that house, in which they ate, studied, bathed, and slept.<sup>1</sup> During the 1970s, Shepher (1971, 1983) examined data on 2769 married couples from 211 kibbutzim, finding that only 14 of these couples came from the same peer group. Shepher (1983) concluded that this presented "a strong case for Westermarck's instinctive avoidance theory." He added that these findings cannot be explained by cultural factors, as, in fact, peer marriages were "preferred by parents and other members of the kibbutz" (pp. 59–60).

<sup>1</sup> It is worth noting though that despite these common features, not all kibbutz movements were the same and some were relatively more conservative. Kibbutzim belonging to the smaller Hashomer Hatzair and Kibbutz Artzi movements, for example, were in general more conservative about sexual activities and children in these movements were also more likely to have mixed boys and girls sleeping arrangements and shower arrangements until a later age.

While many continue to cite Shepher's study as decisive proof for the Westermarck effect, his analyses have drawn significant critiques and his conclusions are quite questionable. First, Hartung (1985) re-analyzed Shepher's original data, showing that the marriage rates Shepher found among members of the same peer group were actually close to what one would statistically expect when considering the availability of other options. Leavitt (2005) further claimed that there were many plausible alternative socio-cultural explanations to Shepher's findings, including age homology, negative social conditioning, and encouragement of relationships with individuals from outside the peer group. Finally, Leavitt argued that, according to Shepher himself, children of the same peer group engaged in intense sexual play with one another until the age of 9 or 10, which was inconsistent with the theory of negative imprinting and sexual aversion.

Shor and Simchai (2009) also criticized Shepher's assumptions, methodology, and conclusions. Based on former studies and on their own research, Shor and Simchai questioned the assumption that intra-peer-group marriages were preferred by parent and the kibbutz society alike. But more importantly, they argued, marriage rates are a questionable measure of sexual attraction, as people who feel mutually attracted and even those who have sexual or romantic relationships often do not end up marrying one another. The kibbutzim society did not have pre-arranged marriage patterns and people were free to choose from a wide variety of potential partners. Those included individuals from other (older or younger) groups in the kibbutz, individuals from other kibbutzim, and others with whom they associated during their army service or in later years (most kibbutzim-raised individuals did not marry at a very young age). Shepher's findings thus did not really show sexual aversion or even sexual indifference, as these feelings were not directly assessed, but were rather inferred from marriage patterns.

With these critiques in mind, I turn now to assess the findings of two recent studies that have returned to the kibbutzim, producing new empirical data on relationships and attraction between co-reared peers (Lieberman & Lobel, 2012; Shor & Simchai, 2009). Both studies considered the methodological critiques on Shepher's study and focused on the feelings and attractions of kibbutz-reared individuals rather than on their marriage patterns. However, they produced what appeared to be contrasting findings, a fact which may add to the confusion about the kibbutzim as a case study for the Westermarck effect.

### Study 1: Shor and Simchai's Interviews with Kibbutz-Reared Individuals

Shor and Simchai's (2009) critique of Shepher's methodology and conclusions led them to conduct their own study of the Israeli kibbutzim. They carried out 60 in-depth interviews with a representative sample of individuals who grew up in the kibbutzim's

communal education system. The results of this study were very different from those of Shepher. They found that almost none of the interviewees reported feelings of sexual aversion toward co-reared peers. In fact, more than half of the interviewees expressed strong or moderate attraction toward at least one of their peers. Despite the existence of these often strong feelings of attraction, most interviewees reported that they did not try to act on their feelings and most did not engage in romantic or sexual relationships with peers (although three of them did report such relationships).

Shor and Simchai found that a number of sociocultural factors were important in explaining differences in attraction levels and romantic/sexual relationships avoidance. Most important among these factors was social cohesion and fears of hurting the integrity of the group. Interviewees were well aware of the delicacies involved in having even a short-term affair with a member of their group. Therefore, in more cohesive and close groups, individuals were less likely to express attraction toward peers. Other factors reported as important in preventing romantic and sexual relationships were age homology (this was especially important for women, who often saw their peers as immature and therefore not attractive) and the general atmosphere in the kibbutzim, often reported to be intolerant of overt sexuality in general and of romantic and sexual relations within the peer group in particular.

Since its publication, Shor and Simchai's study has come under some scrutiny. First, Rantala and Marcinkowska (2011) noted that "in-depth interviews might be prone to confirmation bias (myside bias) on the interviewers' behalf, more so than objective statistics such as the number of marriages... Furthermore, in face-to-face interviews, the interviewees might try to please the researcher by over-stating their feelings toward their peers" (p. 866). This critique poses an important challenge to the study. However, Shor and Simchai stressed that they made particular efforts to conceal from the interviewees the research hypotheses and the aim of the study and that they asked questions in a general way, to minimize myside bias. Furthermore, Shor and Simchai (2009) asserted:

According to many of the interviewees, sexual feelings toward peers were not considered normal or socially legitimate in kibbutz society. Therefore, interviewees would have been more likely to fail to report or repress sexual attractions to peers than the reverse (i.e., to report attraction where none existed). Thus, it is quite reasonable to assume that feelings or experiences of attraction were underreported rather than overreported. (p. 1816)

A second critique of Shor and Simchai's study was published as a commentary by Maryanski, Sanderson, and Russell (2012). Maryanski et al. challenged Shor and Simchai's interpretation of their findings, arguing that we could actually interpret the findings in an alternative way to provide support for the Westermarck hypothesis. According to Maryanski et al., most of the grown-ups in Shor and Simchai's sample did not experience a "classic" kibbutz

upbringing, as by the 1970s home-based sleeping arrangements were well under way, resulting in children spending as much time with their families as they did with their peers. Maryanski et al. argued that this new pattern (which they call “kibbutz lite”) may explain the differences found by Shor and Simchai between older (first and second) and younger (third and fourth) generations in the kibbutzim.

Shor and Simchai (2012) rejected this alternative interpretation by Maryanski et al. First, they asserted that the degree of parental involvement in children’s lives may have grown stronger with the years, but “according to Westermarck, parental involvement and family-centered ideologies are quite irrelevant, as an instinct cannot distinguish between kin and non-kin” (p. 1511). In other words, Shor and Simchai argued that the Westermarck hypothesis does not include any reference to parental involvement. Rather, the mere continuous proximity and social interaction with peers is, according to Westermarck, enough to produce sexual aversion. Shor and Simchai further rejected the critique that the majority of their interviewees did not experience the classic kibbutz communal education. They stressed that their sample included only interviewees (either older or younger) who were “raised together in the full communal education system until at least the age of six, . . . experienced communal sleeping, eating, and showering arrangements and spent the large majority of their time in the communal children’s house” (p. 1511). Thus, Shor and Simchai concluded that because the majority of these children were attracted to their co-reared peers in later years and almost none of them developed feelings of sexual aversion continues to pose a serious challenge to the Westermarck hypothesis.

Finally, one can criticize Shor and Simchai’s study for its failure to adopt a comparative design. While Shor and Simchai clearly documented attraction among co-reared peers, it remains unclear how this attraction compares with the sexual attraction/aversion that those who grew up in the kibbutzim felt toward non-peers and siblings. In other words, it may very well be that even when one felt attraction to a peer, this attraction was not as strong as the attraction toward non-peers. If that were indeed the case, then supporters of the Westermarck hypothesis may still claim that intimate childhood proximity decreases sexual attraction. While this is a valid critique, and we should certainly advocate for a comparative analysis, we should keep in mind two important points. First, as I discuss in more detail below, multiple studies have reported that social scripts in many of the kibbutzim rejected the idea of romantic or sexual relations between co-reared peers (Bettelheim, 1969; Rabin, 1965; Shor & Simchai, 2009; Spiro, 1958; Talmon, 1964) and thus attraction levels to non-peers may not provide an ideal comparison group. Second, even without a comparison group, Shor and Simchai’s finding that most interviewees felt at least some attraction to peers stands in contrast with the original Westermarck Hypothesis, which predicted widespread sexual aversion among peers. As for comparison to attraction levels toward siblings, data on these are hard to obtain through interviews, and it may be preferable to examine this through

anonymous surveys (a method employed by Lieberman and Lobel’s study, which we analyze below).

## Study 2: Lieberman and Lobel’s Surveys among Kibbutz-Reared Individuals

Lieberman and Lobel (2012) chose the kibbutzim as a research site based on the proposition that these provide a unique case study: a rare population where there are no prohibitions against sexual relations with a co-reared peer. Thus, they argued that one can disentangle the effects of kinship cues and those of societal norms. They collected data from two samples (49 participants in total) of individuals who grew up in the kibbutzim. They administered to the two groups surveys examining levels of altruism toward co-reared peers and sexual attraction toward these peers. In addition, they used vignettes and rank-ordering of behaviors to examine moral attitudes toward sexual relations between co-reared peers and between non-co-reared kibbutz siblings. Lieberman and Lobel found that, for male participants, longer co-residence durations with an opposite-sex peer correlated with lower levels of sexual attraction. However, this result was reversed for females—the longer a female participant resided with a male peer, the more appealing she reported sex with him to be (a fact that stands in opposition to Westermarck’s predictions). In addition, Lieberman and Lobel reported a very negative moral judgment of brother-sister sexual relationship, compared with a much less severe judgment of sexual relationships between two kibbutz classmates.

Lieberman and Lobel concluded that their study provided additional evidence that childhood co-residence served as a cue to siblingship, even without actual genetic relatedness. They asserted that their data provided the missing psychological link for past studies on the kibbutzim, by showing that low marriage rates between peers were indeed the result of inherent sexual aversions. Thus, they argued that their study contributed to the growing volume of evidence for the Westermarck hypothesis and the proposition that humans have evolved inbreeding-avoidance mechanisms. These findings and conclusions seem to stand in stark contrast with those of Shor and Simchai. How can these differences be reconciled? Below, I offer an alternative interpretation to Lieberman and Lobel’s results, one that puts into question Westermarck’s original sexual aversion hypothesis and evolutionary explanations.

### *Assessment of Findings and Conclusions*

Lieberman and Lobel’s study was important, as it presented new significant data on sexuality and moral judgments among kibbutz-reared individuals. Lieberman and Lobel must also be commended for moving beyond the traditional measurements for attraction. Former studies on attraction among co-reared individuals (e.g., McCabe, 1983; Shepherd, 1983; Wolf, 1970) used indirect measures of attraction in adulthood, such as marriage



rates, divorce rates, infidelity rates, and birth rates (for a critique of these measures, see Leavitt, 1990, 2005, 2007; Lewin, 2006; Shor & Simchai, 2009). Unlike these studies (and similar to Shor and Simchai), Lieberman and Lobel preferred a direct approach. They used surveys, asking subjects to list those with whom they grew up and rate their reaction to kissing or having sex with each opposite-sex peer. This is a promising methodology, as it retains the anonymity of participants and allows researchers to obtain data even on sensitive issues such as attraction to siblings. However, while this direct questioning is preferable, I argue below that the measures, analysis, and conclusions of the study suffered from important shortcomings.

First, Lieberman and Lobel failed to consider the possibility of changes in feelings of attraction during one's life course. Their survey asked kibbutz-reared individuals to report on their current reaction to the idea of sex with a peer, focusing on adult feelings. This question ignores the possibility that subjects at one time felt attraction to peers (in particular during their adolescent years), but these emotions have later on changed. On the one hand, asking people to retroactively report past feelings has its shortcomings, as the critics of Shor and Simchai's study suggest. On the other hand, assuming that feelings and attitudes in adulthood are representative of one's feelings and attitudes over the entire life course may be even more problematic. This is especially true when considering that the co-reared individuals examined in the study may now be involved in an ongoing relationship, perhaps even married to other people. Under such conditions, thoughts about acts of a sexual nature with others (who may themselves by now be married to others) are likely to be affected by moral approaches toward infidelity.

Second, it is hard to assess what Lieberman and Lobel's results regarding attraction levels mean without having an appropriate comparison group. One possible way to assess the relative level of attraction/aversion of kibbutz-reared individuals toward their peers would have been to compare these feelings with attraction toward non-peer individuals (e.g., co-workers, friends, and acquaintances). It may very well be, for example, that the average person finds the prospect of a romantic relationship with some co-workers to be attractive, while a relationship with other co-workers excites mild aversion. In combination, these feelings may produce a slightly negative average score, similar to the one reported for men (toward peers) by Lieberman and Lobel.

However, even such comparisons, although informative, may be problematic. Many kibbutz-reared individuals no longer live in the kibbutz in which they grew up and no longer see those with whom they grew up on a daily basis. It is hard to equate an assessment of attraction toward an individual whom one has not seen in a few years with attraction toward those one sees on a daily basis. Lastly, the age of the survey participants (all adults) may have also affected perceptions of attraction. For example, it may be that older individuals (compared with adolescents or young adults) are either less interested in sex in general or that they find their peers to be less attractive than before, in accordance with

both evolutionary predictions and cultural norms that often portray older people as less sexually attractive.

Third, Lieberman and Lobel's conclusions about the extent to which their findings demonstrate aversion are also questionable. For each subject, Lieberman and Lobel computed a total sexual attraction score, summing the sexual attraction values for all of the subject's opposite-sex peers. While this produces a valid measure, this analytic approach obscures the variety of erotic feelings and sexual attractions both between different individuals and within each individual's set of relationships. On a scale of  $-10$  to  $10$ , where  $10$  represents strong attraction and  $-10$  strong aversion, the mean results for men in Study 1 and in Study 2 were  $-2.05$  ( $SD = 5.85$ ) and  $-1.39$  ( $SD = 6.76$ ), respectively. These scores seem to represent moderate aversion. However, the SDs also suggest that at least some of the men participating in the survey had a more positive or neutral average score and were likely to be indifferent or even feel attraction rather than aversion toward peers.

Furthermore, even this does not tell the full story. For each of these men (and perhaps some of the women as well), it might be that they were actually very much or at least mildly attracted to at least one of their peers, but not attracted to others (which would still produce a negative average score). We should therefore ask whether it is realistic to expect people to be attracted to all or most of their acquaintances. Take the case of the family as an example. If a man grows up with eight other siblings and finds himself sexually attracted to one of them but not to the others, would we say that erotic (or incestuous) emotions do not exist in that family?

Lieberman and Lobel followed in the tradition of a large number of studies in the last few decades claiming to demonstrate sexual aversion among co-reared individuals (e.g., Fessler & Navarrete, 2004; Lieberman & Symons, 1998; Shepher, 1983; Wolf, 1966; Wolf & Durham, 2005). However, as Shor and Simchai (2009) have argued, none of these studies actually demonstrated sexual aversion per se, but rather (at most) reduced attraction. This point is essential, as reduced attraction cannot in and of itself produce sexual avoidance without the existence of a social taboo or the recognition by individuals of the social prices (e.g., for the integrity of the familial cell) that come with incestuous relations. The same holds true for the study by Lieberman and Lobel, as the data they presented do not justify conclusions on overarching sexual aversion and sexual disgust.

Finally, Lieberman and Lobel do not grant sufficient attention to one of the most important and revealing finding of their study. They asked kibbutz-reared individuals to rank their moral judgment regarding various acts on a scale of  $1-10$  (with  $1$  representing most wrong and  $10$  representing least wrong). In their responses, survey participants ranked "a brother and sister having sex" ( $M = 3.76$ ;  $SD = 2.15$ ) as far more morally wrong than "two kibbutz classmates having sex" ( $M = 8.86$ ;  $SD = 1.55$ ). Lieberman and Lobel dismissed these findings, stating, "we suspect that people indicated high levels of disgust toward actual siblings to seem 'normal'" (p. 33). However, Shor and Simchai

(2009) reported a very similar pattern, noting that almost none of their kibbutz-reared interviewees talked about sexual aversion toward peers. Indeed, without exception, Shor and Simchai's interviewees stressed that their feelings toward peers in no way resembled the feelings of aversion or disgust often associated with sexuality between siblings.

These findings are especially important if we consider Westermarck's (1891) original hypothesis, which states: "[T]here is an innate aversion to sexual intercourse between persons living very closely together from early childhood" (p. 320). Westermarck further asserted that this aversion is an instinct that cannot distinguish between kin and non-kin. Thus, the findings reported by both Shor and Simchai (2009) and Lieberman and Lobel (2012), showing that sex between siblings is much more harshly viewed than is sex between classmates, present a real challenge for the Westermarck hypothesis. After all, children of the kibbutzim spent more time and shared more activities with their peers than with their siblings. Clearly, the social incest taboo (which was just as strong in the kibbutzim as in other societies) had a more powerful effect in this case than the mere degree of close childhood proximity and association.

To conclude, the results of the two studies may be less different than first meets the eye. What seems as a gap between Shor and Simchai's findings of widespread attraction and Lieberman and Lobel's findings of (average) aversion or indifference may be attributed to both different units of analysis and differences in life-period focus. While Shor and Simchai considered attraction to even one group member as evidence of attraction, Lieberman and Lobel preferred to compute an average score for all relationships. In addition, while Shor and Simchai examined their interviewees' entire life-course (with a special emphasis on the teenage years, when interviewees were still living together), Lieberman and Lobel looked at interviewees current feelings toward peers, often years after the peer group had dissolved. Furthermore, both studies presented evidence that feelings of aversion or disgust toward sexual relations with a kin were much stronger than toward sexual relations with a former member of the peer group. Finally, both studies found significant differences in the general levels of attraction between males and females, with males being much more likely than females to feel attraction to a member of their peer group (although, as noted above, co-residence may have affected males and females in different ways).

### The Israeli Kibbutzim as a Case Study: A Reassessment

Following the discussion above, I would like to suggest that we must reexamine the well-accepted axiom that the kibbutzim serve as an ideal case study (the perfect natural experiment) for examining the sources of incest avoidance and the incest taboo. On the one hand, it is true that the kibbutzim provided

a unique setting for testing the original Westermarck hypotheses: a group of children who grew up closely together from a very young age but were not siblings. Therefore, if one believes (as Westermarck and many of his proponents do) that close and prolonged childhood proximity would be enough in and by itself to secure sexual aversion and sexual avoidance, the case of the kibbutzim offers clear refutation. This is because during late childhood, adolescence, and sometimes also in older ages, those who grew up together in the kibbutzim communal education system often exhibited patterns of sexual attraction and some of them also engaged in sexual and romantic interactions (Kaffman, 1977; Leavitt, 2005; Shor & Simchai, 2009; Spiro, 1958; Talmon, 1964). Furthermore, while the evidence regarding women is somewhat more controversial (see above), there is no consistent evidence for sexual aversion toward peers throughout the life course among men who grew up in the kibbutzim.

It is clear, therefore, that the study of the kibbutzim is important in challenging the original Westermarck hypothesis. However, other aspects and characteristics of the kibbutzim suggest that they may not be such an ideal natural experiment after all. Below I discuss three unique aspects that pose a challenge to comparisons between the kibbutz peer group and the family cell. The first two aspects (age homology and parental caregiving) are ones in which the context of the kibbutzim is largely different from that of a family. The third (societal censorship) is actually a point of similarity, but one that puts in question some of the basic assumptions of researchers who have used the case of the kibbutzim to examine the Westermarck hypothesis.

#### Age Homology

The first dissimilarity between the kibbutzim and families is age homology. Unlike in families, where there is typically an age difference between siblings, the kibbutzim were comprised of groups in which peers were roughly the same age. This fact, in turn, may have affected sexual attraction and relationships. Scholars have observed that, for various reasons, human attraction and relationships often form in dyads in which the male is older than the female (Buss, 1989; Groot & van den Brink, 2002; Van Poppel, Liefbroer, & Vermunt, 2001).<sup>2</sup> This tendency is especially true in earlier ages (during adolescence) and is likely to be particularly important for females. Indeed, Shor and Simchai (2009) reported that while the men in their study often found their female peers attractive, the females cited age homology and their male peers' "lack of maturity" as one of the main reasons they did not find them attractive. Hence, one may suspect that if it were not for this age homology (that is, if the kibbutzim peer groups, similar

<sup>2</sup> While sociologists have suggested that this may be the result of social constructions and power dynamics, evolutionary biologists and psychologists have noted that this pattern is true cross-culturally and trans-historically, and is one of the defining characteristics of polygynous species.

to families, had significant age differences), we would potentially see even more cases of attraction and relationships than those reported in the literature.

Noting this age homology in the kibbutzim peer groups, other natural experiments that tested Westermarck's hypothesis may present a setting that is closer to that of the family. Perhaps most notably, Wolf's (1966, 1970) study of Taiwanese minor marriages examined non-sibling co-reared individuals within a familial setting and largely with no age homology (the sons were older than the adopted daughter which they ended up marrying). It is worth noting that despite this age heterogeneity, Wolf reported reduced attraction (although, again, not aversion) among those who grew up together in minor marriage arrangements (compared with other arranged marriages), showing that age homology may not be the most important factor in producing sexual indifference/aversion.<sup>3</sup>

### Parental Care-Giving

A second dissimilarity between the kibbutzim's communal educational system and a family setting is parental care-giving. While this aspect is irrelevant to the Westermarck hypothesis, some sociobiologists have argued for the existence of additional evolutionary mechanisms of kin detection promoting opposition to incest. More specifically, Lieberman et al. (2007) suggested that, in addition to the Westermarck effect, children may also have a kin detection system that identifies "close perinatal association between mother and neonate that begins with birth and is enforced by the exigencies of early mammalian maternal care" (p. 728). This maternal perinatal association mechanism may then be used as an anchor point for sibling detection.

Darwinian social scientists may rightfully point out that peer groups in Israeli kibbutzim did not provide members with this early detection mechanism. Kibbutz children were typically cared for by a caregiver (*metapelet*), who was not their mother. This likely created a real difference in the degree of closeness exhibited between caregiver and child. Indeed, Rantala and Marcinkowska (2011) suggested that this lack of close parental association as a detection mechanism may explain why Shor and Simchai's study found no sexual aversion between peers. While this is indeed one important difference between the kibbutz peer group and nuclear families, I would suggest that this hypothesized kin detection mechanism theory still runs into some difficulties when examining the data from the recent studies on the kibbutzim.

The main finding that serves to cast some doubt on this theory of close perinatal association detection mechanism is the one showing that, almost without exception, those who grew up in the kibbutzim still felt very negatively about the idea of having a sexual relationship with a sibling. This feeling, according to both

Shor and Simchai (2009) and Lieberman and Lobel (2012), was much more powerful and pervasive than any feelings of aversion towards sexual or romantic relationships with peers. Now, one must remember that these children did not grow very closely together with their biologic siblings. They were also not likely to see often their mother caring for this sibling during early infancy (as both were in their respective communal children home). One might, therefore, wonder how such a strong sense of sexual aversion still developed.

One possible explanation for these findings, an explanation that remains in line with the parental perinatal association hypothesis, is that mothers could have carried some traces from breast feeding (most mothers breast fed newborn babies for a few months). These traces may have then been detected by the sibling, who interacted with the mother, perhaps through subliminal smell mechanisms and served as kinship cues. An alternative (or additional) explanation for the development of this sexual aversion toward siblings despite lack of proximity and overt parental association cues would be the existence of the incest taboo. This taboo is (and has always been) just as powerful in the Israeli kibbutzim as it is in other places.

### Societal Censorship

Proponents of the Westermarck hypothesis have often taken for granted another assumption about the kibbutzim, which, as I show below, is quite problematic. This is the notion that children from the same peer group in the kibbutzim had no negative conditioning and were actually encouraged to develop romantic relationships and marry. This notion, however, is nothing more than a myth.<sup>4</sup> It is largely based on Shepher's (1983) assertions, supported by only one episodic evidence—a humoristic remark by a parent of a boy who was found in another girl's bed. In contrast, virtually all other studies conducted on the kibbutzim actually offer substantial evidence that this was not the case, which Darwinian social scientists consistently ignore.

Talmon (1964), for example, contended that children in the kibbutzim were committed to their peer group, which emphasized "all-embracing internal solidarity that discourages exclusive friendships or love affairs" (p. 501). Talmon made it clear that any sexual attraction between opposite-sex peers was discouraged and that "[t]he emphasis on commitment to the group discourages dyadic withdrawal; members look askance at intense friendships of any kind" (pp. 501–502). Spiro (1958), like Talmon, stressed that "all social activities are group—rather than couple—oriented" (p. 327). The parents, the *Mosad* (the educational establishment), and the kibbutz authorities were "opposed to sexual intercourse among students" (p. 328) and "there seem to

<sup>3</sup> Below (in the section that examines the issue of social censorship), I examine Wolf's study of the Taiwanese case in more detail and discuss its strengths and weaknesses.

<sup>4</sup> This marks another clear difference between the Israeli case and other cases such those of Taiwan (Wolf, 1966, 1970) and Lebanon (McCabe, 1983). In these latter examples, marriage was encouraged (in fact, often enforced), while in the case of the kibbutzim, kibbutz society often frowned upon in-group romantic relationships.

be almost no violations of the *Mosad* taboo on sexual intercourse” (p. 333). Rabin (1965) argued that “kibbutz taboos and prohibitions in regard to sex play and sexual contacts are strict and unrelenting. These taboos apply primarily to members of the peer group with whom the contact is continuous for many years. The taboos are not unlike the brother-sister taboos in the conventional family” (p. 33). Bettelheim (1969) wrote that “to feel sexual desires for each other runs counter to the value of the youth society... This is something on which parents, *metapelets* [care givers], kibbutz, and age-group agree. It is wrong for the children to have sexual feelings for each other, period” (p. 238). Finally, Kaffman (1977) argued that at least until the mid-1960s there were clear “puritanical” attitudes in the kibbutz community regarding sexual relations between adolescents.

Shor and Simchai’s (2009) more recent study further suggested that at least until the late 1960s, and to some extent even later on, most kibbutzim held a rigid and conservative approach toward sex and sexuality. Sex was not discussed and sexual relationships outside marriage were considered illegitimate. Under this atmosphere, even when they felt attraction, most interviewees refrained from doing anything about this attraction. Furthermore, even in later years, sexual relationships within one’s peer group were considered to be off limits in at least some of the kibbutzim. Shor and Simchai quoted one interviewee who claimed that “it was always ‘in the air’ that classmates are not supposed to be attracted to each other; it was very clear and well known” (p. 1827). Other interviewees equated the social prohibition on sexual relationships among peers to the incest taboo, emphasizing that there were clear differences between the two, but also some similarities.

Given this considerable body of evidence, the claim that there were no informal sanctions against sexual relationships between same-group peers is clearly ungrounded. Social norms and pressures played an important role in determining the approaches of group members toward romantic and sexual relationships with peers and their willingness to engage in open and fully disclosed relationships of this sort. It appears, then, that the environment and norms in the kibbutzim were much more similar to those governing families than what scholars commonly assume. These norms included social taboos and prohibitions on sexuality, which certainly existed even if they were not as powerful as the taboo on incestuous relationships. Therefore, it is safe to say that a study on the kibbutzim cannot truly disentangle the influences of kinship cues from those of societal norms.

Here we may once again turn our attention to other case studies of co-reared peers, such as Wolf’s (1966, 1970) study of Taiwanese minor marriages and McCabe’s (1983) study of cousin marriages in Lebanon. In both of these cases, marriage among co-reared peers was encouraged (in fact, often enforced) by the family. Therefore, one may argue, they provide “cleaner” settings for testing the effects of close childhood proximity on attraction net of societal taboos than the case of the kibbutzim. The fact that both of these studies reported reduced sexual attraction (although not aversion) among co-reared peers suggests that

growing together in close proximity may indeed decrease sexual attraction even without the presence of an incest taboo or social prohibitions. One may attribute this to the existence of a Westermarck effect, but also to alternative psychological mechanisms, such as habituation.

However, despite these advantages of the Taiwanese test case, it is important to note that this case is far from providing an ideal setting for testing Westermarck’s hypothesis and, in some ways, it is more problematic than the case of the kibbutzim. Notably, Leavitt (2005) has suggested that we must take into account social factors such as the harsh treatment of the *sim pua* brides, potentially creating resentment toward all family members and in particular, the brothers/future husbands who often received preferential treatment. Leavitt also noted the low status of minor marriages and the fact that these marriages often drew strong social ridicule, which may explain why they were unsuccessful. Read (2014) further problematized the Taiwanese case study by noting that the adopted daughter and the son were raised together as sister and brother and not as future wife and husband. The two were only told that they are not brother and sister at about the time the marriage were to be consummated. Therefore, from their perspective, the marriage required from them an involuntary violation of the cultural incest taboo against brother-sister marriage.<sup>5</sup>

We may, therefore, conclude that while the case of the kibbutzim is somewhat problematic for studying evidence for or against the Westermarck hypothesis, other well-celebrated case studies present their own challenges. Each of these settings differs from standard nuclear families in important ways, and therefore any conclusions that we draw from such studies about inbreeding avoidance in families or about the origins of the incest taboo must be particularly careful, acknowledging these limitations and the potential alternative explanations for study results.

## Discussion

In this article, I reevaluated recent research on the Israeli kibbutzim. I argued that, contrary to what may first appear to be irreconcilable differences in the findings and conclusions of recent studies, the insights we may draw from these studies are actually quite similar. First, it is clear that the case of the kibbutzim poses a challenge to the original Westermarck hypothesis. There is no evidence that simply growing up together was enough to create sexual aversion or eliminate sexual attraction. In fact, attraction was widely reported despite the existence of quite a few social forces (such as group cohesion, kibbutz ideologies, and age homology),

<sup>5</sup> For more detailed critiques regarding the use of both the Taiwanese and the Lebanese cases as evidence for the association between close childhood co-socialization and sexual aversion, see Leavitt (1990, 2005, 2007), Shor & Simchai (2009), and Read (2014).



which worked against this attraction and against forming romantic dyadic relationships. Second, the fact that those who grew up in the kibbutzim's communal education system reported much stronger negative feelings associated with sexual relations with a sibling (compared with sexual relations with a peer) is revealing, as these findings seem to attest to the powerful influence of the sociocultural incest taboo.

At this point, one may ask why we continue to find such large discrepancies in scholarly conclusions regarding what the case of the kibbutzim really tells us. I would like to suggest that this stems from a larger problem: the two studies examined here are, in fact, emblematic of the rift between what one may call cultural social sciences on the one hand and Darwinian sociobiology on the other. More specifically, while researchers advancing the former theoretical perspective continue to engage critically with the findings and arguments of sociobiologists (El Guindi & Read, 2012; Graber, 1984; Harris, 1991; Leavitt, 1989, 1990, 2005, 2007; Leiber, 2006; Read, 2014; Shields, 1982, 1987; Shor & Simchai, 2009, 2012), the latter often ignore important findings and challenges presented by sociologists and cultural anthropologists. Consequently, many sociobiologists continue to work with misguided preliminary assumptions, use misleading language, and interpret findings in a questionable manner (Leavitt, 2005, 2007; Leiber, 2006; Read, 2014). Despite some notable exceptions in recent years (see, for example, Rantala & Marcinkowska, 2011; Turner & Maryanski, 2005), much of the sociobiological scholarship continues to overlook or dismiss offhandedly important critiques on the Darwinian perspective, and continues to cite questionable research findings and conclusions as if these were uncontested.

As an example of this tendency, one may consider the edited volume by Wolf and Durham (2005), which claims to summarize the current state of knowledge on inbreeding, incest, and the incest taboo. This volume contains views from a host of leading scholars, who differ on some of the issues related to incest avoidance and the incest taboo. However, the volume presents an overall agreement that "Westermarck was proved right" (Wolf, 2005b, p. 10) and no voice is given to dissenting evidence and critiques from social scientists who bring cultural challenges to these views. Another glaring example is Lieberman's prolific and influential line of research (Lieberman, 2006, 2009; Lieberman & Lobel, 2012; Lieberman & Symons, 1998; Lieberman, Tooby, & Cosmides, 2003; Lieberman et al., 2007), which routinely cites studies claiming to present supporting evidence for the Darwinian view without even mentioning the challenges to these studies.

### **Moving Toward a Synthetic Theoretical Approach, Clearer Empirical Predictions, and Better Measurements**

Leavitt (2005, 2007) has pointed out that the tendency for all-or-nothing explanations stands in the way of developing a more balanced approach to research endeavors, one which acknowledges

the limited explanatory power of both evolutionary and sociocultural mechanisms and is more careful in its conclusions and assertions. I agree and would like to reiterate Leavitt's assertion that being critical of current explanations does not suggest that biological and psychological theories have no value in our understanding of incest avoidance and attraction among co-reared peers. In other words, it is not my intention to replace one (sociobiological) deterministic approach with another (sociocultural). Human sexuality is clearly influenced by a complex combination of biological, evolutionary, psychological, and sociocultural factors.

I therefore propose that in order to advance the field and begin to close the rift that I refer to above, it is important to develop a more synthetic approach in trying to understand inbreeding avoidance among kin and co-socialized nonrelatives. Only when we acknowledge that neither biological and evolutionary mechanisms nor sociocultural ones can fully explain this phenomenon, can we begin to move beyond dichotomies and develop a more realistic and useful theory of inbreeding avoidance. Below, I propose a few principles for this synthetic approach, which I believe should guide future research efforts.

First, we need to acknowledge that the existence of evolutionary kinship cues indeed appears to reduce, although clearly not eliminate, attraction. These cues include both close childhood co-socialization, and the opportunity to observe close association between one's parents (in particular mothers) and a kin neonate (De Smet, Van Speybroeck, & Verplaetse, 2014; Fessler & Navarrete, 2004; Lieberman & Lobel, 2012; Lieberman et al., 2007; Sesardic, 2005). Moreover, it is important for us to recognize the potential role of other physiological and psychological processes in affecting attraction between peers. For example, various studies have noted the significance of habituation, the search for something new and different, and the importance of versatility and change in maintaining and rekindling sexual desire.

From an empirical standpoint, this review suggests four important guidelines for future research. First, studies of the kibbutzim and other similar settings should be sensitive to changes in sexuality and sexual orientations throughout the life course rather than focusing on particular periods. Feelings of sexual attraction and aversion are often fluid and fluctuating. An attraction toward an individual may shift with the passage of time and sexual orientations as a whole often vary within the same individual at different periods (Diamond, 2003; Kinnish, Strassberg, & Turner, 2005; Morgan & Morgan, 2008). Specifically, one may feel attraction toward an individual at a certain point in time (e.g., during adolescence) but then find the same person unattractive later on (and vice versa).

A second recommendation for future empirical research is paying greater attention to sex differences in attraction and to the ways in which biological processes, psychological tendencies, and sociocultural norms differentiate between females and males reaction to co-socialization and to the social incest taboo. Both Shor and Simchai (2009) and Lieberman and Lobel (2012) found

significant differences in the effects of co-socialization on men and women who grew up in the Israeli kibbutzim. Such differences are in line with theoretical frameworks that stress differences in sexuality between men and women (Diamond, 2004; Peplau, 2003; Weinrich, 1987). These theories distinguish between two types of erotic attraction—lust and limerence. While the former is more readily experienced by men in our culture, the latter is more regularly experienced by women. That is, women tend to emphasize committed relationships as a context for sexuality more than men do. In addition, while men are more likely to associate sexual desire with physical pleasure and intercourse, women are more likely to associate desire with emotional intimacy, long-term commitment, and love. In the case of incest and the incest taboo, these distinctions suggest that men may be more likely to feel desire toward a co-reared sibling, with this lust often being detached from a more general romantic interest. Given the gender power imbalance, this may also suggest that even when there is no mutual sexual attraction, men would be more likely to impose their sexual desires on female family members, which might account for the fact that familial incest often takes the form of rape.

The third conclusion coming from the analysis presented here is that we need clearer standards for what constitutes sexual attraction and what we should consider as sexual aversion. Once again, I commend the tendency of the recent studies of the kibbutzim to move from “objective” measures of attraction (such as marriage and divorce ratios or fertility trends) toward more subjective measures, which emphasize people’s phenomenological experience; I believe it is a step in the right direction. However, even with such phenomenological measures, it remains important to try to reach greater agreement on what constitutes support for either evolutionary or sociocultural approaches.

Part of the reason that the results of Shor and Simchai (2009) and those of Lieberman and Lobel (2012) appear to be so different is the failure of both studies to define clearly and a priori the criteria for demonstrating sexual aversion or sexual attraction. For example, when individuals grow up among a group of people (or among several family members), should we average their feelings toward all of these group or family members or should we examine each of these relationships separately? Furthermore, when looking at a group of co-socialized individuals, how may we judge the existence of attraction? For example, if we examine X individuals, how many of them would we require to demonstrate feelings of attraction and how many should feel sexual aversion toward peers in order for us to determine that this group tends toward either attraction or aversion? Above, I suggested that even a minority of co-reared individuals who report substantial attraction to peers (or even to one peer) would be sufficient to put in question Westermarck’s original hypothesis of powerful aversion. However, in order to move forward and improve our understanding of the balance between biological and cultural forces in shaping attraction and aversion, I believe we need clearer criteria and enhanced agreement regarding the measurement of sexual attraction.

My fourth and final recommendation for future research—greater use of comparative data—may provide an important step forward toward such clearer criteria. Shor and Simchai’s (2009) study demonstrated substantial attraction levels among co-reared individuals in the kibbutzim. However, it is hard to assess whether this attraction exceeded the attraction felt toward non-peers. While Shor and Simchai’s interviews suggest that this may not be the case, Shor and Simchai did not provide a systematic comparison to assess this. Similarly, Lieberman and Lobel (2012) did not compare the current attraction level of individuals raised in the kibbutzim toward their co-reared peers with their attraction level toward other similar individuals, and so we lack a base or a context that would help us assess whether co-residence indeed resulted in reduced attraction toward co-socialized peers. Future studies of the kibbutzim and of similar settings should therefore aspire to examine attraction toward co-reared peers within the context of individuals’ general levels of attraction toward similar equivalent but non-co-reared peers.<sup>6</sup>

## References

- Bettelheim, B. (1969). *The children of the dream*. London: Collier-Macmillan.
- Bischof, N. (1972). The biological foundations of the incest taboo. *Social Information*, 2, 7–36.
- Bischof, N. (1975). Comparative ethology of incest avoidance in biosocial anthropology. In R. Fox (Ed.), *Biosocial anthropology* (pp. 37–67). London: Malaby.
- Bixler, R. H. (1981). Incest avoidance as a function of environment and heredity. *Current Anthropology*, 22, 639–654.
- Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1–49.
- Bvec, I., & Silverman, I. (1993). Early proximity and intimacy between siblings and incestuous behavior: A test of the Westermarck theory. *Ethology and Sociobiology*, 14, 171–181.
- Bvec, I., & Silverman, I. (2000). Early separation and sibling incest: A test of the revised Westermarck theory. *Evolution and Human Behavior*, 21, 151–161.
- Dawkins, R. (1983). Opportunity costs of inbreeding. *Behavioral and Brain Sciences*, 6, 105–106.
- De Smet, D., Van Speybroeck, L., & Verplaetse, J. (2014). The Westermarck effect revisited: A psychophysiological study of sibling incest aversion in young female adults. *Evolution and Human Behavior*, 35, 34–42.
- Diamond, L. M. (2003). Was it a phase? Young women’s relinquishment of lesbian/bisexual identities over a 5-year period. *Journal of Personality and Social Psychology*, 84, 352–364.

<sup>6</sup> In the case of the kibbutzim, fruitful comparisons can be made with levels of attraction toward other co-educated individuals. One option is a comparison with children/teenagers who joined the group at a later age, for example with *yaldei hutz* (outsiders)—city-raised children who were sent to live and be educated with kibbutz children, often around the age of 13, in order to take advantage of what was considered to be superior upbringing in an elite society. Another possible comparison group would be similar-age children/teenagers who came from other kibbutzim (in many cases, the peer groups from different kibbutzim were co-educated during their high-school years, sometimes under boarding school conditions).

- Diamond, L. M. (2004). Emerging perspectives on distinctions between romantic love and sexual desire. *Current Directions in Psychological Science*, 13, 116–119.
- Durham, W. H. (2005). Assessing the gaps in Westermarck's theory. In A. P. Wolf & W. H. Durham (Eds.), *Inbreeding, incest, and the incest taboo: The state of knowledge at the turn of the century* (pp. 121–138). Stanford, CA: Stanford University Press.
- El Guindi, F., & Read, D. (2012). Westermarck hypothesis reconsidered: A comment on Kushnick and Fessler. *Current Anthropology*, 53, 134–135.
- Erickson, M. T. (1989). Incest avoidance and familial bonding. *Journal of Anthropological Research*, 45, 400–413.
- Erickson, M. T. (1993). Rethinking Oedipus: An evolutionary perspective on incest avoidance. *American Journal of Psychiatry*, 150, 400–413.
- Fessler, D. M. (2007). Neglected natural experiments germane to the Westermarck hypothesis: The Karo Batak and the Oneida community. *Human Nature*, 18, 355–364.
- Fessler, D. M., & Navarrete, C. D. (2004). Third-party attitudes toward sibling incest: Evidence for Westermarck's hypothesis. *Evolution and Human Behavior*, 25, 277–294.
- Fox, R. (1980). *The red lamp of incest: An enquiry into the origins of mind and society*. Notre Dame, IN: University of Notre Dame Press.
- Freud, S. (1950 [1913]). *Totem and taboo*. New York: W. W. Norton.
- Graber, R. B. (1984). Can aversion explain the incest taboo? Comment on McCabe. *American Anthropologist*, 89, 408–410.
- Groot, W., & van den Brink, H. M. (2002). Age and education differences in marriages and their effects on life satisfaction. *Journal of Happiness Studies*, 3, 153–165.
- Harris, M. (1991). *Cultural anthropology* (3rd ed.). New York: Harper & Row.
- Hartung, J. (1985). Review of "Incest: A biosocial view", by J. Shepher. *American Journal of Physical Anthropology*, 67, 169–171.
- Kaffman, M. (1977). Sexual standards and behavior of the kibbutz adolescent. *American Journal of Orthopsychiatry*, 47, 207–217.
- Kinnish, K. K., Strassberg, D. S., & Turner, C. W. (2005). Sex differences in the flexibility of sexual orientation: A multidimensional retrospective assessment. *Archives of Sexual Behavior*, 34, 173–183.
- Kopytoff, I. (1984). On the viability of sibling marriages: A comment on McCabe's argument. *American Anthropologist*, 86, 407–408.
- Kushnick, G., & Fessler, D. M. (2011). Karo Batak cousin marriage, cosocialization, and the Westermarck hypothesis. *Current Anthropology*, 52, 443–448.
- Kushnick, G., & Fessler, D. M. (2012). Misconstruals miss the mark: A reply to El Guindi and Read. *Current Anthropology*, 53, 136–137.
- Leavitt, G. C. (1989). Disappearance of the incest taboo: A cross-cultural test of general evolutionary hypotheses. *American Anthropologist*, 91, 116–131.
- Leavitt, G. C. (1990). Sociobiological explanations of incest avoidance: A critical review of evidential claims. *American Anthropologist*, 92, 971–993.
- Leavitt, G. C. (2005). *Incest and inbreeding avoidance: A critique of Darwinian social science*. New York: Edwin Mellen Press.
- Leavitt, G. C. (2007). The incest taboo? A reconsideration of Westermarck. *Anthropological Theory*, 7, 393–419.
- Leiber, J. (2006). Instinctive incest avoidance: A paradigm case for evolutionary psychology evaporates. *Journal of the Theory of Social Behaviour*, 36, 369–388.
- Lévi-Strauss, C. (1969). *The elementary structures of kinship*. Boston: Beacon Press. (Originally published 1949).
- Lewin, T. (2006, July 9). *At colleges, women are leaving men in the dust*. Retrieved January 24, 2012, from <http://www.nytimes.com/2006/07/09/education/09college.html?pagewanted=all>.
- Lieberman, D. (2006). *The evolution of inbreeding avoidance in humans: Ultimate explanations and proximate mechanisms*. Paper presented at the Sydney Symposium of Social Psychology, Sydney, Australia. Retrieved from [http://www.sydneysymposium.unsw.edu.au/2006/Chapters/Lieberman\\_chapter\\_draft1.doc](http://www.sydneysymposium.unsw.edu.au/2006/Chapters/Lieberman_chapter_draft1.doc).
- Lieberman, D. (2009). Rethinking the Taiwanese minor marriage data: Evidence the mind uses multiple kinship cues to regulate inbreeding avoidance. *Evolution and Human Behavior*, 30, 153–160.
- Lieberman, D., & Lobel, T. (2012). Kinship on the kibbutz: Coresidence duration predicts altruism, personal sexual aversions and moral attitudes among communally reared peers. *Evolution and Human Behavior*, 33, 26–34.
- Lieberman, D., & Symons, D. (1998). Sibling incest avoidance: From Westermarck to Wolf. *Quarterly Review of Biology*, 73, 463–466.
- 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: Biological Sciences*, 270, 819–826.
- Lieberman, D., Tooby, J., & Cosmides, L. (2007). The architecture of human kin detection. *Nature*, 445, 727–731.
- Maryanski, A., Sanderson, S. K., & Russell, R. (2012). The Israeli kibbutzim and the Westermarck hypothesis: Does early association dampen sexual passion? A comment on Shor and Simchai. *American Journal of Sociology*, 117, 1503–1508.
- Maynard Smith, J. (1978). Constraints on human behavior. *Nature*, 276, 121.
- McCabe, J. (1983). FBD marriage: Further support for the Westermarck hypothesis of the incest taboo? *American Anthropologist*, 85, 50–69.
- Morgan, E. M., & Morgan, E. M. (2008). "Mostly straight" young women: Variations in sexual behavior and identity development. *Developmental Psychology*, 44, 15–21.
- Murdock, G. P. (1949). *Social structure*. New York: Macmillan.
- Parsons, T. (1954). The incest taboo in relation to social structure and the socialization of the child. *British Journal of Sociology*, 5, 101–107.
- Peplau, L. A. (2003). Human sexuality: How do men and women differ? *Current Directions in Psychological Science*, 12, 37–40.
- Rabin, A. I. (1965). *Growing up in a kibbutz*. New York: Springer.
- Rantala, M., & Marcinkowska, U. M. (2011). The role of sexual imprinting and the Westermarck effect in mate choice in humans. *Behavioral Ecology and Sociobiology*, 65, 859–873.
- Read, D. (2014). Incest taboos and kinship: A biological or cultural story? *Reviews in Anthropology*, 43, 150–175.
- Sahlins, M. (1960). The origin of society. *Scientific American*, 48, 76–89.
- Schneider, M. A., & Lewellyn, H. (2000). Olfactory sexual inhibition and the Westermarck effect. *Human Nature*, 11, 65–91.
- Sesardic, N. (2005). From genes to incest taboos: The crucial step. In A. P. Wolf & W. H. Durham (Eds.), *Inbreeding, incest, and the incest taboo: The state of knowledge at the turn of the century* (pp. 109–120). Stanford, CA: Stanford University Press.
- Shepher, J. (1971). Mate selection among second-generation kibbutz adolescents and adults: Incest avoidance and negative imprinting. *Archives of Sexual Behavior*, 1, 293–307.
- Shepher, J. (1983). *Incest: A biosocial view*. New York: Academic Press.
- Shields, W. M. (1982). *Philopatry, inbreeding, and the evolution of sex*. Albany, NY: SUNY Press.
- Shields, W. M. (1987). Dispersal and mating systems: Investigating their causal connections. In B. D. Chepko-Sade & S. T. Halpin (Eds.), *Mammalian dispersal patterns: The effects of social structure on population genetics* (pp. 3–24). Oxford: Clarendon.
- Shor, E., & Simchai, D. (2009). Incest avoidance, the incest taboo, and social cohesion: Revisiting Westermarck and the case of the Israeli kibbutzim. *American Journal of Sociology*, 114, 1803–1842.
- Shor, E., & Simchai, D. (2012). Exposing the myth of sexual aversion in the Israeli kibbutzim: A challenge to the Westermarck hypothesis. *American Journal of Sociology*, 117, 1509–1513.
- Spiro, M. E. (1958). *Children of the kibbutz*. New York: Schocken.
- Talmon, Y. (1964). Mate selection in collective settlements. *American Sociological Review*, 29, 491–508.

- Turner, J. H., & Maryanski, A. (2005). *Incest: Origins of the taboo*. London: Paradigm Publishers.
- Van Poppel, F., Liefbroer, A. C., & Vermunt, J. K. (2001). Love, necessity and opportunity: Changing patterns of marital age homogamy in the Netherlands, 1850–1993. *Population Studies*, 55, 1–31.
- Weinrich, J. (1987). *Sexual landscapes: Why we are what we are, why we love whom we love*. New York: Scribner.
- Westermarck, E. A. (1891). *The history of human marriage*. London: Macmillan.
- White, L. A. (1948). The definition and prohibition of incest. *American Anthropologist*, 50, 416–435.
- Wolf, A. P. (1966). Childhood association, sexual attraction, and the incest taboo: A Chinese case. *American Anthropologist*, 68, 883–898.
- Wolf, A. P. (1968). Adopt a daughter-in-law, marry a sister: A Chinese solution to the problem of the incest taboo. *American Anthropologist*, 70, 864–874.
- Wolf, A. P. (1970). Childhood association and sexual attraction: A further test of the Westermarck hypothesis. *American Anthropologist*, 72, 503–515.
- Wolf, A. P. (1993). Westermarck redivivus. *Annual Review of Anthropology*, 22, 157–175.
- Wolf, A. P. (2005a). Explaining the Westermarck effect, or, what did natural selection select for? In A. P. Wolf & W. H. Durham (Eds.), *Inbreeding, incest, and the incest taboo: The state of knowledge at the turn of the century* (pp. 76–92). Stanford, CA: Stanford University Press.
- Wolf, A. P. (2005b). Introduction. In A. P. Wolf & W. H. Durham (Eds.), *Inbreeding, incest, and the incest taboo: The state of knowledge at the turn of the century* (pp. 1–23). Stanford, CA: Stanford University Press.
- Wolf, A. P., & Durham, W. H. (Eds.). (2005). *Inbreeding, incest, and the incest taboo: The state of knowledge at the turn of the century*. Stanford, CA: Stanford University Press.