ELSEVIER

Evolution and Human Behavior 22 (2001) 295–328

Evolution and Human Behavior

Blood, solidarity, status, and honor
The sexual balance of power and spousal abuse in Sonora, Mexico

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Received 10 January 1999

Abstract

Independent samples of 128 women and 106 men were interviewed in a study site in Hermosillo, Sonora, Mexico. Respondents were screened for involvement in a committed sexual relationship during the past year, but not with each other. Questions pertained to family structure, support, and conflict; females reported on victimization by spousal aggression and males on perpetration. Previously documented effects of their partner's mate quality ("sex") and socioeconomic status ("money") were cross-culturally replicated. The following family structure parameters were also measured: (1) the local density of female kin, (2) the local density of male kin, (3) the social support provided by local kin, (4) the socioeconomic status of close kin, and (5) the "culture of honor" revenge ideology of the respondents. The same interactions of local density of male kin that protected women from spousal abuse also empowered men to perpetrate it. The risk of spousal abuse was mitigated by the "sexual balance of power" between the family structures of potential victims and potential perpetrators. Evidence was also found partially supporting several alternative hypotheses

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PII: S1090-5138(01)00067-8

tested regarding local cultural and ideological mechanisms (culture of honor and patriarchal beliefs), major dimensions of psychopathology (anxiety and depression) and substance abuse (alcohol), and indicators of general criminality (permissive and risk-taking attitudes).

Keywords: Domestic violence; Spousal abuse; Coercive sexual strategy; Extended family structure; Sex-biased dispersal; Patriarchy; Culture of honor; General criminality

1. Introduction

This paper concerns the role of extended family structure and related cognitive and ideological factors on domestic violence between 1996 and 1999 in the city of Hermosillo, the capital of the State of Sonora, in northwestern Mexico. This study constitutes part of an ongoing international project on family structure (Proyecto Internacional Sobre la Estructura Familiar) with other study sites in Spain, Mexico, Costa Rica, and Arizona. The two principal objectives of this multinational survey are to cross-validate and to extend the model that was developed describing the causes of domestic violence in a sample of battered and nonbattered women collected in Tucson, Arizona (Figueredo & McCloskey, 1993). Because critically important social patterns, such as the ideologies of patriarchy and honor and the structure of the extended family, may vary systematically between different cultural groups, we needed to test the generality of our results across human societies. We expected that panhuman universals would emerge from this multinational survey, but that they would be substantially moderated by the prevailing social conditions in different parts of the world.

One explanation positing panhuman universals for the dynamics of domestic violence derives from the field of evolutionary psychology. In this view, competition for mates within both sexes generates the analogue of a ''sexual marketplace'' (Crawford & Johnston, 1999; Symons, 1979) where the sexually relevant assets of each potential partner are evaluated by the other in the process of initial mate choice and subsequent sexual fidelity. Thus, stable sexual partnerships are likely to be matched on overall mate quality by these market forces. If either partner perceives that the quality of a prospective or current mate is or somehow becomes less than their own, it becomes possible for that partner to optimize their own prospects by leaving the relationship and ''trading up'' to a better quality mate. This same process of assessment is expected to apply to both male and female mate choice strategies. However, although certain characteristics are generally deemed desirable in mates of both sexes, such as intelligence and kindness (Buss, 1989), some of the specific assets that most contribute to mate quality for men and women are known to differ systematically.

For example, wealth and status are deemed, virtually worldwide, to be more important determinants of mate quality for men than for women (Crawford & Johnston, 1999; Symons, 1979). Thus, a man who has either lost or never achieved wealth or status may correctly perceive himself to be at a competitive disadvantage with respect to

rival males in either obtaining or retaining mates (Perusse, 1993). Whether or not such female preferences are sexually selected or instead created by entrenched power imbalances in society remains politically controversial, but the observation that these preferences are nearly universal in our species is an empirical fact (Buss, 1989, 1994). Therefore, to acquire or retain a mate of higher quality than himself, such a disadvantaged individual might resort to using physical force as a coercive sexual strategy (Thornhill & Thornhill, 1992), deploying what may be his last advantage over the woman.

Figueredo and McCloskey (1993) have tested this theory by using 21 converging measures of relevant mate quality parameters, including but not limited to male and female wealth and status, as predictors of domestic violence. These predictors also included various measures of the quality of the sexual relationship, including conditions of cohabitation, perceptions of love, assessments of jealousy, and reports of sexual fidelity, as well as reports of the genetic paternity, numbers, and ages of the female's dependent offspring. This multivariate model accounted for 60% of the variance in spousal abuse, including verbal, physical, escalated, and sexual forms of violence. This model also predicted 25% of the variance in the husband's child abuse as an indirect effect of his spousal abuse. Controlling for the indirect effects through spousal abuse, no direct effects of any of the predictors of domestic violence on child physical or sexual abuse were found to be statistically significant. These findings suggest the use of the children as virtual hostages in the sexual coercion of the mother. Thus, although ambient social, cultural, and political factors might explain *how* men seek to dominate and control women sexually, evolutionary psychology may shed some light on *why* they ultimately desire to do so, and why some men are so threatened by any erosion of that power (cf., Buss, 1996).

Nevertheless, evolutionary theory does not predict that the woman will passively accept male sexual coercion, but instead develop counterstrategies to domination (Hrdy, 1977, 1986). Among these is the use of any familial social support and resources that she has at her disposal to offset the effects of the greater physical and economic power typically wielded by the male. Such assistance is predicted to be more forthcoming from her consanguineal family, or genetic relatives, based on the theory of kin-selected altruism (Hrdy, 1981). However, this prediction requires that the social structure be such that ready access to her kin group is a real possibility.

The prevailing pattern of sex-biased dispersal would influence the relative geographical distances of women from their kin with respect to that of men from theirs. For example, a pattern of strong patrilocality would bias against a woman living near her genetic relatives but provide the men with the advantages of local consanguineal family ties. This is one possible basis for the evolution of an androcentric sexist bias in certain traditionally patrilocal human societies, where the local males are all related by blood, and thus more likely to cooperate, but their mates tend to be unrelated to each other, and thus socially disunited (cf., Hrdy, 1981; Smuts, 1995). Because the female offspring of such a community would eventually disperse, an androcentric social bias would favor the men and their male offspring, who are likely to remain in the group, while minimizing the impact on their female offspring, who are slated to depart. The losers in this system

would be the immigrant females, who are individually overwhelmed by the solidarity of the local male kin group. It would be more difficult for any genetically based and reproductively relevant sexism to evolve in a community without sex-biased dispersal. This is because sexual discrimination would favor offspring of one sex at the expense of those of the other.

Based on comparative evidence from studies of nonhuman primates and human ethnographic literature, Smuts (1992) generated five major hypotheses regarding the possible factors responsible for variation in women's vulnerability to both wife beating and sexual coercion. These hypotheses predict that male aggression toward women will increase when: (1) female alliances are weak, (2) females lack support from natal kin, (3) male alliances are strong, (4) male relationships are less egalitarian, and (5) male control of resources increases.

Although humans are predominantly patrilocal, there is much regional variation in the patterns of dispersal and exogamy (Thornhill, 1991). Thus, we would expect any consequent power imbalances between the sexes to be strongly moderated by these demographic patterns. For example, the existence of a strong extended family structure might serve as a countervailing force and function to set real limits to the oppression of women even in a primarily patrilocal and, thus, patriarchal system. For example, the absolute economic dependency of the woman on her husband might be mitigated, and the proximity of her male kin, such as fathers, uncles, and brothers, might provide a credible deterrent to physical assault. Therefore, the prediction was that the prevalence of domestic violence in different human societies is directly related to the family structure. The extended family, as a social resource to exogamous women, functions as a protective societal factor limiting the more extreme manifestations of patriarchy. Variations in family structure within societies could therefore be used to test the efficacy of this hypothesized causal force.

Thus, one of the critical predictions that can be derived from evolutionary theory, connecting the psychological and social forces that impinge on this phenomenon, is that a family structure favoring the continuation of close lifelong ties of a woman to her natal, or "consanguineal," family as opposed to her marital, or "conjugal," family, would serve as a major protective factor against spousal abuse by her mate. We referred to this prediction as the family deterrence hypothesis. Such close and continuing extended family structures are quite prevalent in many Mediterranean countries, such as Spain, as well as many countries of the New World, primarily because of the large contributions, both cultural and genetic, made by the former Spanish Empire to the many different societies of the Americas. Nevertheless, recent studies of domestic violence among Hispanics living within the United States have shown great heterogeneity in the prevalence of spousal abuse (Kaufman Kantor, Aldarondo, & Jasinski, 1993). This heterogeneity within the general category of Hispanics is so great as to often overwhelm the magnitude of their differences with respect to non-Hispanic American groups. For example, whereas Mexican Americans and Puerto Ricans have the highest rates of spousal abuse among Hispanics, Cuban Americans have a lower prevalence of spousal abuse when compared to both other Hispanics and non-Hispanic White Americans, even when controlled for

differences in socioeconomic status (Kaufman Kantor et al., 1993). We suspected that the explanation of this great heterogeneity might lie partially in the dynamics of opposing social forces and structural contradictions originating in the shared cultural homeland of the former Roman province of Hispania, or Spain. Conversely, there might be certain ancestral protective factors that were somehow differentially either lost or retained in the conquest, colonization, hybridization, and acculturation of different parts of the former Spanish Empire.

2. The Madrid Pilot Study

A telephone survey of both battered and nonbattered women was conducted in Madrid to constructively and cross-nationally validate and the results of the previous study conducted in Tucson, Arizona (Figueredo, Bachar, & Goldman-Pach, 1996; Figueredo et al., 1998). The principal research hypothesis was that a woman's extended kin network would serve as a protective factor against spousal abuse. Composite indices were constructed of the spatial distribution, both inside and outside Madrid, of the woman's genetic relatives, each weighted by their coefficients of relatedness to her, as well as the emotional and instrumental family support that she received from them collectively. Wright's coefficient of relationship (r.g) is the proportion of genes shared between any two individuals by common descent. As expected, the kin density inside Madrid accounted for all reported family support. Surprisingly, however, the family support factor did not significantly affect domestic violence. Nevertheless, the woman's densities of genetic kin both inside and outside Madrid were found to significantly reduce domestic violence. Because these effects were not significantly mediated by reported family support, our tentative interpretation of these findings is that the protective effects of kin networks were primarily attributable to the principle of deterrence rather than that of support.

Upon hearing our first HBES conference presentation on these data, a colleague (Denise Cummins, personal communication, 1996) suggested that if the deterrence hypothesis was valid, it should be primarily the woman's male kin and not the woman's female kin that would be reducing the woman's risk of spousal abuse. This prediction was confirmed. When disaggregated by sex, it was found that the effects of the woman's male kin both inside and outside Madrid upon spousal abuse were increased, as compared with the aggregated effects of all her male and female kin, and that the effects of the woman's female kin both inside and outside Madrid upon spousal abuse were decreased, to the point of statistical nonsignificance. This was in spite of the fact that the effects of the women's female kin upon family support remained significant and comparable to the corresponding effects of the women's male kin. Although this does not necessarily rule out all plausible alternative hypotheses, it provides stronger support for our tentative interpretation of the causal mediation of this effect through deterrence. Before disaggregation of kin densities by sex, this model accounted for 75% of the variance in spousal abuse; afterwards it accounted for 80%.

3. The Hermosillo study

The present paper reports the results obtained from two independent samples of women and men that were interviewed in a study site in Hermosillo, Sonora, Mexico. In the present study, we changed our oversampling design from one of "criterion sampling," or "conditioning on the consequence," to one of "predictor sampling," or "conditioning on the antecedents" (Dawes, 1988, 1993, 1994), by using identified risk factors rather than known cases of spousal abuse. One potential problem with the Madrid pilot results stemmed from the fact that so large a portion of our battered women's sample was drawn from battered women's shelters. It was brought to our attention at an HBES conference presentation (Martin Daly, personal communication, 1996) that this sampling bias might have produced a spurious correlation component between spousal abuse and lack of local kin support because the women that wind up in the shelter might be disproportionately those that have no kin support to fall back upon. None of the participants in the Hermosillo Study were obtained from a battered women's shelter to avoid this potential source of sampling bias.

To provide stronger support for the family deterrence hypothesis, we needed to address various alternative hypotheses that could be put forward to explain some of the same results. Because the use of experimental control is neither practical nor ethical within the study of domestic violence, the only method available to us for addressing the remaining confounds and alternative hypotheses identified was that of statistical control. This meant that we had to make a sincere and concerted effort to gather as much data on this possible confounds and extraneous influences as possible within the limitations of an extended interview format. Further, we would have to test all these alternative hypotheses within a single predictive model to assess their possible influences (Chamberlin, 1897; Cook, 1985; Cook & Campbell, 1979; Figueredo, 1993; Platt, 1964).

First, male and female kin differ not only in gender, per se, but in socioeconomic status and coercive power in the majority of human societies, and this may have produced a spurious correlation component in the observed sex differences in the influence of local kin on the risk of spousal abuse. In addition, some of the Spanish American societies that we are studying, such as Mexico, have among the highest rates of social inequality in the world, and we deemed it highly probable that asymmetries in family socioeconomic status might influence the outcome of any social contest either within or between families. A related issue is that male and female respondents may tell different stories regarding the incidence or nature of spousal abuse based on various possible sources of differential gender bias, such as systematic male underestimation of the damage done to females by superior male size and strength in aggressive or coercive sexual encounters (Mary Koss, personal communication, 1996).

Another source of concern was that our original path models contained direct effects of local gene replicate densities on spousal abuse that were not explicitly mediated by any observed or reported behavior of the individuals presumed to be carrying them. In the real world, genes are rarely known to leave their chromosomes and act directly upon external social affairs in such an unseemly manner. To overcome this limitation, we delved more

deeply into the social mechanisms by which family deterrence might operate. Fortunately, evolutionary psychologists have explored the possible origins of such possible protective factors as "indirect reciprocity," "blood revenge," and "family honor" (Alexander, 1987; Daly & Wilson, 1988) as evolved adaptive strategies, and two social psychologists have recently produced an entire volume on the "culture of honor" (Nisbett & Cohen, 1996), a manifestation of this phenomenon, which is proposed as a virtually universal characteristic of herding (as opposed to farming) societies and their latter-day descendants. Nisbett and Cohen (1996) have also identified an entire battery of critical issues on which the ideology of honor can be reliably discriminated and multiply operationalized.

Similarly, the feminist theory of patriarchy holds that both physical and sexual violence towards women within marriage are essentially the sociocultural products of structural and status inequalities between the sexes and that these entrenched social arrangements are ultimately founded on the ideology of patriarchy (cf., Finkelhor & Yllo, 1985; Lerner, 1986; Yllo, 1983, 1984a, 1984b, 1987). However, the currently dominant form of this theory, which resides within the overarching framework of radical cultural determinism, does not account for individual differences in risk of spousal abuse within the same patriarchal or nonpatriarchal society (cf., Liesen, 1995). Also, by presuming conflict as a universal consequence of patriarchy, the feminist theory of patriarchy does not account for possible conflict or confluence in patriarchal or nonpatriarchal beliefs between individuals and their partners. To overcome these limitations, we examined individual differences in adherence to patriarchal beliefs between different respondents as well as between respondents and their partners.

Another source of cognitive distortion that could have influenced our previous results was the possibility that a pervasive "negativity bias" in the self-reports of abused women may have produced a spurious correlation component between reported partner mate quality and reported spousal abuse. Although there was no direct way to measure this generalized "negativity," per se, we instead monitored some of the proximate causal factors, such as Anxiety and Depression, which are believed to be psychologically plausible sources of affective and cognitive biases. In certain cognitive models of depression, for example, systematic "negativity" pervades cognitive processes and negatively biased schemas generally distort both the abstraction and interpretation of events (Beck, 1987). Similarly, alcohol abuse by both the woman and her partner is a known risk factor for both spousal abuse and sexual violence (cf., Kantor & Straus, 1990), but was initially omitted from the path models. We therefore included measures of habitual alcohol use by both respondents and their partners.

Finally, another plausible alternative hypothesis that we had previously failed to consider in our initial model can be derived from the general theory of crime (Gottfredson & Hirschi, 1990), which predicts a strong statistical association between sexual coercion and nonsexual crimes. The general theory of crime asserts that criminals are predominantly individuals who have low "self-control" and who take advantage of opportunities to commit crimes for immediate gratification and give little consideration to the consequences for themselves or their victims. Thus, their theory would predict that both sexual coercion (including, within our own formulation, spousal abuse) and nonsexual criminality is primarily attributable to the

single causal factor of low impulse control. From this perspective, there would be nothing special about the etiology of spousal abuse and such antisocial conduct would be expected from any individual high on generalized criminality, given the requisite opportunity. Fortunately, although respondents did not admit to the commission of actual crimes, this hypothesized causal factor was more directly assessed by means of items relating to their generally permissive attitudes towards what others would call criminal behavior as well as to their generally favorable attitudes towards risk-taking.

These alternative hypotheses were all addressed in the Hermosillo Study by including measures of the relevant constructs and testing them all as additional predictors in the context of our theoretical model. This had the inevitable effect of making our analysis more complicated, but had the advantage of establishing what we believe to be a stronger case for our evolutionary theories.

4. Methods

4.1. Subjects

The study was based on the interviews of 128 women and 106 men. All participants were interviewed in Hermosillo, Sonora, Mexico between 1996 and 1998. All respondents were screened for having been involved in committed sexual relationships during the past year, but not relationships with each other. This last precaution was taken to avoid any harm that might come to one partner if it were detected that he or she was reporting to us on the other.

The participants were recruited as two independent subsamples to represent either members of the local population according to social class, or people who were consulting a local service organization and schools because of some problem with family functioning.

4.1.1. Social class subsamples

The interviewees were either lower class ($n = 33$), lower-middle working class ($n = 45$), or upper-middle class ($n = 8$). The lower-class subsample was recruited from poorer neighborhoods (Colonias) or areas where a large proportion of unemployed persons are known to congregate. The lower-middle working class subsample was obtained primarily from a suburb of Hermosillo (called Nuevo Hermosillo) populated primarily by workers of the Ford Motor Company. These are mostly employed but lower middle-class skilled workers who are chronically underpaid due to governmental restrictions on their salaries. This neighborhood is also locally notorious for problems with alcohol abuse and street crime. The upper-middle-class subsample was obtained by recruiting members of a men's breakfast club that met regularly at a local restaurant and by recruiting women who were referred to us by a local organization of professional and business women (Asociación de Mujeres Profesionistas y de Negocios). These subsamples were considered at different levels of risk for both spousal and child abuse because of the documented role of the relative socioeconomic status and employment stability of the partners on domestic violence (Figueredo & McCloskey, 1993).

4.1.2. Family dysfunction subsamples

Three groups of interviewees represented different levels and types of family dysfunction: two groups with marital problems ($n = 79$) and one group with children who were identified as exhibiting conduct disorder or learning problems ($n = 65$). Both men and women were referred to us by Centro Integral de Attención para Mujeres (CIAM), which is a nongovernmental nonresidential service organization that provides a wide array of legal, medical, and psychological services to women with various social and family problems. Other men and women were referred to us by a legal service agency (Bufete Jurídico de la Escuela de Derecho de UNISON) for low-income women who are considering separation or divorce due to marital problems. By law, this agency also provides mediation services prior to proceeding with more extreme legal solutions such as separation or divorce. These two high-risk marriage groups were considered at high risk for spousal abuse because severe marital conflicts, especially those involving imminent separation or divorce (cf., Wilson & Daly, 1992), are known to exacerbate family violence, including spousal homicide. Another subsample was constructed from the parents of children who had been identified at local schools (Alberto Gutierrez and Cruz Galvez) as having conduct and learning disorders (Problemas de Conducta). This subsample was also considered high-risk because of the known multiple correlation between spousal abuse, child abuse, and various forms of child psychopathology, notably conduct disorders (McCloskey, Figueredo, & Koss, 1995).

These recruiting sources were selected to oversample informative cases of spousal abuse as is necessary for low incident events. The U.S. 1995 National Violence Against Women Survey of some 8000 women (Tjaden & Thoennes, 1998), found that when asked to enumerate occurrences during "the last 12 months," the percentage of women reporting sexual assault was 0.3%, the percentage of women reporting physical abuse was 1.9%, and the percentage of women reporting either physical or sexual assault was 2.1%. For a sample numbering slightly over 200 respondents, as in the present study, if the same incidence of assaults prevailed then these percentages would be expected to yield at most two or three informative cases, which would be clearly inadequate to support testing any predictive hypotheses.

Nevertheless, the current oversampling plan was designed to avoid the possible biases inherent in criterion sampling, or "conditioning on the consequence" (Dawes, 1988, 1993, 1994), which in this case entails sampling known cases of spousal abuse, as by sampling from battered women's shelters. Instead, oversampling may be more safely done by predictor sampling, or "conditioning on the antecedents," which in this case entails sampling based on known or suspected risk factors of spousal abuse rather than definite knowledge of the occurrence of spousal abuse itself. Because there is no single sampling scheme that is completely free of sampling bias, due to the different "local molar conditions" (Campbell, 1986) of each sampling situation, we hoped to instead avail ourselves of the "heterogeneity of irrelevancies" (Cook, 1993; Figueredo, 1993) that might be presumed to exist between these different subsamples. Based on the principle of using heterogeneous methods to offset each others' intrinsic biases (Campbell & Fiske, 1959; Cook & Campbell, 1979), the idea was to sample on multiple theoretically specified antecedents and construct a composite and

hopefully heterogeneous sample based on different risk factors, rather than on any single one. This procedure, which might be called "conditioning on multiple antecedents," was intended to somewhat mitigate the limited external validity often produced by predictor sampling and can only be expected to work if the subsamples are combined into a single composite sample. Thus, to construct a maximally informative sample with predictor sampling, one loses the direct generalizability of one's parameter estimates in the attempt to describe the underlying causal processes that might be at work in the general population without addressing issues of relative prevalence. For example, when a behavioral geneticist compares a sample of MZ to DZ twins, he is constructing what has been called a "genetically informative sample"; these focused comparisons reveal the processes of genetic transmission that are presumably common to all humans, whether or not they are twins. However, such a design does not specifically address the relative prevalence of either type of twinning, and, if misused in that way, would produce vastly distorted estimates of prevalence as compared with the general population. Therefore, if properly used and interpreted, it is often beneficial to intentionally construct an unrepresentative sample.

4.2. Procedures

Respondents were initially contacted either in person at their own home or over the phone in the case of some referrals from agencies. All respondents were informed in advance that they would be participating in a study on extended family structure and its relationship to family conflict. They were also informed that they could choose to stop the interview at any time or to refuse to answer any individual question without discontinuing the interview. Most of the interviews were conducted in the respondents' own homes by a native Spanish speaker and generally took anywhere from one to two hours. Our interviewers, which were mostly females but included a few males, met with a few individuals in various other places that were more convenient for them. We acceded to all requests for alternative meeting places and times in light of the possible safety issues for the protection of the study participants. Interview questions pertained mostly to the respondents' family structure, family support, and family conflict, including their possible experience of domestic violence. In this present study, we also measured plausible sources of cultural and ideological mechanisms (culture of honor and patriarchal beliefs), major dimensions of psychopathology (anxiety and depression) and substance abuse (alcohol), and indicators of "general theory of crime" criminality (permissive and risk-taking attitudes), to test the relevant dimensions as alternative hypotheses regarding the potential causes of the observed levels of domestic violence.

4.3. Measures

While the interview protocol included numerous measures, those reported in this paper primarily concerned the types and amounts of aggression between individuals within the family and the demographic and socioeconomic profiles of individuals within the family. All assessment instruments were translated by native Spanish speakers who were experienced in

such translation. The following are brief descriptions of the specific measures used. Some of these measures were published scales, used in their entirety, whereas others were carved-out scales composed of selected subsets of items from published scales. Other scales were author-constructed, by either adapting selected items from a variety of existing measures or generating new ones by following very closely the published theories of measurement cited. Where scoring deviated significantly from standard practice, an explanation of our method is provided. A complete listing of the items used in the various carved-out and author-constructed scales is provided in Appendix A, but not for any published scales that were used without significant modification. Internal consistencies (Cronbach's alpha) for each of these scales, whether used directly, carved-out, or author-constructed, are provided in the section on statistical analyses.

4.3.1. Spousal abuse

We administered 15 of the 19 items (see Appendix A) of the Conflict Tactics Scales (Straus, 1979, 1990b) to each respondent. In addition, we asked several further questions about "escalated," life-threatening, or homicidal violence (e.g., "How often has he threatened to kill you?" or "How often has he harmed or killed pets?") and rape or sexual abuse within the relationship (e.g., "How often has he forced you to have sexual intercourse against your will, when you didn't want to?"). We adapted this same set of items to obtain self-reports of male perpetration of spousal abuse as well as female victimization by their partners. However, we did not symmetrically monitor female spousal abuse of male partners, which is typically self-defensive in nature and initiated by male aggression (cf., Daly & Wilson, 1988), to avoid unnecessarily increasing the respondent burden.

4.3.2. Sexual relationship dynamics

To better understand the dynamics of the respondents' primary sexual relationships, we asked them questions relating to the general quality of their relationship with their current partner. To obtain an estimate of the mate value that they attributed to their current sexual partners, we used documented parameters of mate quality for both sexes (Buss, 1989, 1994) as well as their marital status, including how long they dated, were engaged, and have been married (see Appendix A).

4.3.3. Family demographics

Our demographic questionnaire assessed such items as the respondents' and their partners' current employment status, their separate incomes from work and other sources, their perceived social class, years of education completed, and their current occupations (see Appendix A). We also asked them how many children they had in the household and if these children belonged to either one or both partners or were either stepchildren or adopted. In addition, we asked them to count for us how many genetic relatives they had both inside and outside the city of Hermosillo, specifying that any "in-laws" or relations by marriage be excluded from this tally. This was done by enumerating each type of relative by category (e.g., uncles, aunts, nephews, and nieces), and we accepted reasonable approximations

where exact numbers were not available (which occurred in some of the larger families). We then asked detailed questions on the socioeconomic status of immediate blood kin (e.g., father, mother, sisters, brothers) with the highest coefficient of relationship (r.g = 0.50). This was used as a proxy for the general socioeconomic status of the entire extended family because it was not deemed reasonable to expect any individual to remember that level of detail for all his or her genetic relatives. Finally, we asked a published battery of 17 questions regarding the amounts and types of both emotional and instrumental social support typically received by each respondent from his or her genetic relatives (Barrera, Sandler, & Ramsay, 1981).

4.3.4. Cognitive and ideological factors

To assess the self-reported adherence to patriarchal values of the respondent and that of the respondent's partner, and to put this construct into a form more amenable to empirical testing, we constructed a patriarchy scale (see Appendix A) that reflected beliefs regarding male hegemony in marital relationships that are commonly held in mainstream Mexican culture (cf., Diaz-Guerrero, 1975).

We also included an additional set of items inspired by Nisbett and Cohen's (1996) "Culture of Honor" theory to assess adherence to an ideology of revenge that would serve as a justification for the instrumental use of violence within both the intrafamilial and interfamilial spheres of social life. These items (see Appendix A) consisted of hypothetical vignettes for which the respondent is asked to either approve or disapprove the actions of a hypothetical protagonist involved in either a negative or positive social exchange. Wherever we refer to a respondent's personal culture or code of honor throughout the present paper, we use it to denote the specific ideology assessed by the respondent's score on this "revenge" factor, a psychometric construct that we believe to be generally consistent with the original ethnographic descriptions (e.g., Nisbett & Cohen, 1996).

Measures of general anxiety and depression were obtained by "carving out" shortened versions of the Hamilton (1959) Anxiety Scale and the Hamilton (1980, 1985) Depression Scale, selecting 11 items and 14 items, respectively, based on sampling the broader domain of anxious and depressive symptoms (see Appendix A). These were included to control for any spurious "negativity bias" effects on the self-reports of both partner mate quality and spousal abuse. The habitual alcohol use of both the respondent and the respondent's current partner were assessed by asking several questions on the frequency and quantity on "equivalent" drinks typically imbibed on weekdays and on weekends. These items were originally derived and then adapted from the parent's version of the Diagnostic Inventory for Children and Adolescents (cf., Reich, Earls, Frankel, & Shayka, 1993; Reich & Herjanic, 1989).

General criminality was assessed by asking the respondent to endorse or reject views reflecting attitudes that were either permissive towards criminality, impulsive, or risk prone (Gottfredson & Hirschi, 1990). A total of 16 items of this type were drawn from published research applying the general theory of crime perspective (see Appendix A). Because this measure represents one particular view of the nature of criminality, we will use general theory of crime criminality throughout this paper, in spite of its possible awkwardness, to emphasize the theory-bounded specificity of this construct.

4.4. Statistical analyses

4.4.1. Scale construction

The statistical software package used for all of these analyses was SAS 6.12 (SAS Institute, 1989). First, we theoretically assigned the items to hypothesized factor scales. We computed unit-weighted common factor scores for all the factor scales in SAS (PROC STANDARD and DATA), using the means of the standardized item scores for all nonmissing items on each subscale (Figueredo, McKnight, McKnight, & Sidani, 2000). Theoretically specified interactions between scales were also computed in SAS by the creation of multiplicative terms (Cohen & Cohen, 1983). Although the main effects of the various interaction terms were included in the prediction equations, all possible interactions between them were not generated and tested, but only those that were predicted by theory were constructed and included in the multiple regression model. We also computed both the Cronbach's alphas and the covariance matrices of the factor scales in SAS (PROC CORR). The internal consistencies of each of these factor scales is presented in Table 1. Some of these scales had somewhat lower alphas due to a low number of items, but had acceptable item–factor correlations. The single-item scales, calculated local kin density indices, and interaction terms that were included in the model, but for which Cronbach's alphas are not applicable, are presented in Table 2.

Although we used an augmented subset of items from the Conflict Tactics Scales (CTS), we constructed and psychometrically validated our own theoretically specified subscales and scoring systems for these items. This nonstandard usage was developed because there are several problems with the CTS as typically applied (see White, Smith, Koss, Figueredo, 2000) and reflects our different theoretical orientation. The way that the CTS is used within the present study addresses most of these problems and the validity of our measures is not contingent upon that of the standard usage of this instrument by Straus and others. First, the more intensive nature of the present study places the violence

Table 1
Interitem consistencies (Cronbach's α) of unit-weighted factor scales

Code	α	Description of measure
SPOUSAL	.89	Spousal abuse (verbal, physical, escalated, sexual)
P-MQ	.70	Partner mate quality (“sex”)
P-SES	.71	Partner socioeconomic status (“money”)
S-PATR	.78	Self-Patriarchy Scale
P-PATR	.73	Partner Patriarchy Scale
S-HONR	.89	Self-Honor Scale (“revenge”)
S-ANXI	.83	Self-Anxiety Scale (Hamilton)
S-DEPR	.79	Self-Depression Scale (Hamilton)
S-ETOH	.69	Self alcohol use (composite)
P-ETOH	.77	Partner alcohol use (composite)
S-CRIM	.70	Self GTC criminality (permissive and risky attitudes)
K-SUPP	.78	Kin social support (emotional, instrumental)
K-SES	.65	Kin socioeconomic status (r.g = 0.50)

Table 2
Single-item scales, calculated local kin density indices, and interaction terms

Code	Description of measure
S-AGE	Self age (years)
P-AGE	Partner age (years)
MK-DENS	Local male kin density (Hermosillo)
MK-SUPP	Local male kin density × Kin support
MK-POWR	Local male kin density × Kin support × Kin status
MK-PROT	Local male kin density × Kin support × Kin status × Self honor
FK-DENS	Local female kin density (Hermosillo)
FK-SUPP	Local female kin density × Kin support
FK-POWR	Local female kin density × Kin support × Kin status
FK-PROT	Local female kin density × Kin support × Kin status × Self honor

back within the context of the broader interpersonal, familial, social, and cultural settings. Second, although most of the same items are used in our modified version of the CTS (largely because there are not many more common forms of violence to ask about), the way that they are scored is entirely different at several levels. For one thing, the nonlinear transformation implied by the definition of the categories was eliminated. We simply asked respondents for the actual number of times they remembered experiencing each act of aggression as either the victim or the perpetrator. Only when respondents were completely unable or unwilling to estimate this (which was only in a small minority of cases) were they asked to specify an approximate range (of which the median was used for our analyses). Thus, the CTS' insensitivity to differences in frequencies at the moderate to high ends of the spectrum was circumvented. These raw frequencies were then aggregated within each of four categories of abuse: (1) verbal, (2) physical, (3) escalated (life threatening), and (4) sexual. Aggregating within these four categories only implicitly equated behaviors that were comparable in relative degree of escalation. These four subscales were then used to create the General Spousal Abuse Factor. By giving roughly equal weight to the four subscales in the common factor, rather than to the individual items, the CTS' overrepresentation of more moderate forms of abuse (such as verbal) was entirely circumvented.

Because it was not possible to separately estimate the direct effects of both self-reported anxiety (S-ANXI) and depression (S-DEPR) in the same regression models due to their high collinearity (0.66 for women and 0.64 for men), these two measures were combined into a single composite scale (S-ANXDEP), which was used to control for the hypothesized "negativity bias." This aggregation was done by calculating the mean of the nonmissing values of their standardized scores, as explained above.

The local kin densities of male and female relatives of each respondent were computed by assigning a coefficient of relationship (r.g) to each category of genetic relative enumerated, assuming normal diploid sexual reproduction and no significant inbreeding between close relatives. Each coefficient of relationship was multiplied by the number of individuals reported in each category and these products were then summed for each gender. A simple algorithm for this procedure was programmed in SAS (DATA). Thus, these indices

represented sums of the number of relatives of each type, weighted by their genetic coefficients of relatedness to the respondent, and were essentially equivalent to measures of the local spatial density of the gene replicates of the respondent. These indices were then used in combination with various lower-order factor scales to compute multiplicative terms representing multiple-scale interactions, as explained above.

4.4.2. Multiple regression models

We entered all these factor scales, computed indices, and theoretically specified interactions as predictors in two multiple regression models, using SAS (PROC REG). As specified above in the description of the oversampling design, all social class and family dysfunction subsamples were pooled within each sex of respondent, but separate regression models were constructed for the independent samples of women and men. This single distinction was maintained primarily because of the fundamental difference in the operational definition of the spousal abuse criterion variable, which was victimization of women and perpetration by men. In either case, the social class and family dysfunction subsamples were too small to support separate analyses and would also have suffered from the restriction of range within each group (cf., Cohen & Cohen, 1983). Furthermore, the demographic differences between these groups were hypothesized to be quantitative rather than qualitative in nature, meaning that they do not really represent different populations but rather different parametric ranges within a single population. This interpretation is supported by the fact that diagnostically including a categorical variable representing subsamples as distinct groups within the model, using SAS (PROC GLM with the ABSORB command), had the consequence of reducing both the significance levels and magnitudes of some effects, as might be expected due to the subsamples absorbing a portion of the systematic variance from the predictors on which they were ultimately based, but did not change the basic pattern of results.

5. Results

5.1. Descriptive statistics

The mean age of all study participants was 33.8 years. The mean number of children was 2.21 with the current partner, of which 56% were male, and only 0.09 with anyone other than the current partner, of which 43% were male. This translates into only 14 couples in the sample who had any stepchildren. The mean age of the children was 7.78 with the current partner and 9.82 with presumably previous partners. The mean level of education was somewhere between middle school or trade school, not completed and completed, but this varied widely between people with virtually no education and those with professional degrees. The professional level of study participants also varied widely, but averaged between unemployed and unskilled laborer for the women and between skilled laborer and administrative employee for the men. Most participants rated their social status as falling somewhere between lower middle class and middle class, and this class identification varied

somewhat less, being roughly equal for women and men. Mean monthly income was 1450 pesos for the combined sample, which is between two and three Mexican minimum wages, but averaged only 713 pesos for women (barely over one minimum wage) and 2335 pesos for men (nearly four minimum wages).

The mean female kin density in Hermosillo was 2.09 for women and 1.85 for men. The mean male kin density in Hermosillo was 1.54 for women and 1.55 for men. What this indicates is that the average respondent, whether male or female, had significantly more close female relatives in town than male relatives. A kin density of 2.00 would represent the equivalent of either four full siblings (0.50×4), eight first cousins (0.25×8), etc. The number of male relatives in town is reduced by the approximate equivalent of one full sibling for both sexes of respondent. This is probably due to the dispersal of males seeking economic opportunities elsewhere. This pattern of male-biased dispersal is unusual for humans and is opposite to the one we found in the Madrid pilot sample (with a mean sex ratio of about 0.8:1 in Hermosillo as opposed to 1.8:1 in Madrid; Figueredo et al., 1998). If this is representative of the population at large, this should theoretically put female residents of Hermosillo at much greater risk of spousal abuse.

The mean aggregate frequency of verbal abuse for all respondents, including both victimization of women and perpetration by men, was 63.5; this mean was 102.3 reported incidents for the women and 18.0 reported incidents for the men. The total number of respondents reporting an aggregate frequency of verbal abuse greater than zero was 195; of these respondents, 102 were women and 93 were men. The mean aggregate frequency of physical abuse for all respondents, including both victimization of women and perpetration by men, was 7.3; this mean was 12.3 for women and 1.6 for men. The total number of respondents reporting an aggregate frequency of physical abuse greater than zero was 75; of these, 42 were women and 33 were men. The mean aggregate frequency of escalated abuse for all respondents, including both victimization of women and perpetration by men, was 1.3; this mean was 2.1 for women and 0.3 for men. The total number of respondents reporting an aggregate frequency of escalated abuse greater than zero was 25; of these, 20 were women and 5 were men. The mean aggregate frequency of sexual abuse for all respondents, including both victimization of women and perpetration by men, was 1.9; this mean was 3.4 for women and 0.1 for men. The total number of respondents reporting an aggregate frequency of sexual abuse greater than zero was 15; of these, 11 were women and 4 were men.

The only two categories of spousal abuse that were found significantly different in mean aggregate frequency between women and men were verbal abuse, $F(1,220) = 4.54$, $P = .034$, and physical abuse, $F(1,220) = 3.94$, $P = .048$, of which women reported receiving substantially more than men reported perpetrating. Controlling for sex of respondent, the only category of spousal abuse that was found significantly different in mean aggregate frequency between subsamples was physical abuse, $F(4,220) = 2.54$, $P = .041$, of which the lower-class subsample reported substantially more than did the others (with a mean of 24.0 compared to the grand mean of 7.3). Controlling for both sex and subsample of respondent, for no category of spousal abuse were there any significant interactions found between subsample and sex of respondent in mean aggregate frequency.

The only category of spousal abuse that was found significantly different in the proportion of respondents reporting an aggregate frequency greater than zero was escalated abuse, $\chi^2(1) = 7.23$, $P = .007$, which more women reported receiving than men reported perpetrating. However, because the reported mean aggregate frequencies of both escalated abuse and sexual abuse were so low, failure to find correspondingly significant differences between women and men for these two low-base-rate categories should not be considered conclusive.

Overall, the patterns of reporting of spousal abuse, as reflected by both the mean aggregate frequencies and the proportion of respondents with nonzero aggregate frequencies, were rank ordered as follows: (1) verbal abuse > physical abuse > escalated/sexual abuse and (2) female victimization > male perpetration. These findings support the nonstandard scoring of our modified form of the CTS as well as our strategy of separately analyzing the data for each sex in parallel regression models. Furthermore, the general nonsignificance of differences in mean aggregate frequencies of spousal abuse between subsamples, with a single unsurprising exception (higher physical abuse in the lower-class subsample), supports our strategy of pooling the subsamples into a single composite sample for each sex of respondent. Finally, the elevated overall rates of reporting for all categories of spousal abuse support the strategy of predictor sampling based on our selection of identified risk factors.

5.2. Multiple regression models

Table 3 presents the results of the multiple regression models for each sex of respondent. The statistics tabulated are the ordinary least squares (OLS) standardized regression weights (β weights), with their associated *t* tests and probabilities under the null hypothesis ($\beta = 0$), all listed separately by column for women and for men. The coefficients of determination (squared multiple correlations) for the spousal abuse factor were quite high in both samples ($R^2 = .68$ in the female sample and $R^2 = .87$ in the male sample), indicating that the greater proportion of the observed variance in reported spousal abuse were accounted for by the specified model predictors.

Several cognitive and ideological factors were included in the structural model as multiple alternative hypotheses to control for any spurious components of the correlations previously found (Figueredo & McCloskey, 1993) between the respondents' self-reports of partner socioeconomic status, partner mate quality, and partner-perpetrated spousal abuse. These factors included: self-reported patriarchy (S-PATR), reported partner patriarchy (P-PATR), assessed personal honor (S-HONR), self-reported depression (S-DEPR), self-reported alcohol use (S-ETOH), reported partner alcohol use (P-ETOH), and self-reported GTC criminality (S-CRIM). The effects of the Partner Mate Quality (P-MQ) and Partner Socioeconomic Status (P-SES) factors on reported spousal abuse were therefore determined when controlling for these otherwise confounding influences. The main effects and specified two-way, three-way, and four-way interactions of the respondent's family structure parameters on reported spousal abuse were then estimated to evaluate the predictions of the family deterrence hypothesis.

Table 3
Multiple regression for predictors of spousal abuse

Spousal abuse	Women (victimization)			Men (perpetration)		
Predictor	β weight	*t* test	*P* (β > 0)	β weight	*t* test	*P* (β > 0)
P-MQ	− 0.19	− 2.16	.033	− 0.28	− 2.28	.026
P-SES	− 0.07	− 0.68	.495	0.04	0.34	.735
S-AGE	− 0.13	− 1.22	.225	0.18	1.23	.225
P-AGE	0.05	0.45	.651	− 0.25	− 1.67	.101
S-PATR	0.12	1.31	.195	0.10	0.73	.471
P-PATR	− 0.07	− 0.81	.417	− 0.06	− 0.55	.584
S-HONR	− 0.07	− 0.94	.349	0.23	2.42	.019
S-ANXDEP	0.27	3.30	.001	0.26	2.60	.011
S-ETOH	0.04	0.48	.636	0.08	0.79	.434
P-ETOH	0.11	1.41	.162	0.05	0.45	.651
S-CRIM	− 0.08	− 1.17	.245	0.05	0.43	.670
K-SUPP	0.09	1.12	.264	0.17	1.55	.125
K-SES	− 0.02	− 0.16	.870	0.03	0.22	.830
MK-DENS	0.14	1.13	.262	0.57	2.35	.022
MK-SUPP	0.15	1.29	.200	0.99	3.60	.001
MK-POWR	− 0.44	− 2.79	.007	0.83	2.17	.034
MK-PROT	− 0.49	− 3.62	.001	1.79	3.70	.000
FK-DENS	− 0.08	− 0.56	.574	− 0.23	− 0.95	.347
FK-SUPP	− 0.04	− 0.39	.696	− 0.44	− 1.78	.080
FK-POWR	0.25	1.52	.133	− 0.55	− 1.94	.057
FK-PROT	0.15	1.07	.289	− 1.11	− 2.88	.005

The first set of influences on spousal abuse tested were those found previously and labeled "sex" and "money" (Figueredo & McCloskey, 1993). Perceived partner mate quality (P-MQ/sex) directly and substantially decreased both the self-reported spousal abuse of women and the self-reported perpetration of spousal abuse by men. Partner socio-economic status (P-SES/money) did not directly influence either the self-reported spousal abuse of women or the self-reported perpetration of spousal abuse by men, acting only indirectly as a significant correlate of partner mate quality for women, but not for men. This first set of findings constituted a qualitative cross-cultural confirmation of the previous results obtained in a Tucson, Arizona, sample (Figueredo & McCloskey, 1993). However, this replication was limited by several factors. The negative effect of partner mate quality on spousal abuse, for example, was originally predicted for the mate quality of the partners of the women but not for those of the men. This was primarily because the Tucson sample was composed exclusively of female respondents, so no corresponding results were available for male respondents. However, this might have led to some misinterpretations of the original data that will be discussed at greater length below. Second, too few reconstructed families, which include stepchildren as well as genetic offspring, were sampled in Hermosillo to replicate previously documented effects of respondent's number of children with their current partner ("paternity").

The second set of influences tested relate to the hypothesized cognitive and ideological influences on spousal abuse. The effects of age were included in the regression model to control statistically for any greater adherence to more traditional beliefs by older respondents or their older partners. However, neither respondent age (S-AGE) nor partner age (P-AGE) directly influenced either the self-reported perpetration of spousal abuse by the men or the self-reported spousal abuse of the women. Furthermore, neither the self-reported patriarchal beliefs of women (S-PATR) nor the self-reported patriarchal beliefs of men directly influenced either the self-reported spousal abuse of women or the self-reported perpetration of spousal abuse by men, respectively. Moreover, the patriarchal beliefs attributed to their partner (P-PATR) by either men or women did not directly influence reported spousal abuse. Nevertheless, the assessed personal code of honor (S-HONR) of men directly increased the self-reported perpetration of spousal abuse by men, whereas the assessed personal code of honor of women did not directly influence the self-reported spousal abuse of women.

The self-reported anxiety and depression (S-ANXDEP) of the respondents, regardless of their sex, directly increased self-reported spousal abuse, whether of perpetration by men or of victimization of women. The self-reported alcohol use of the respondents (S-ETOH), whether they were men or women, did not directly influence either the self-reported perpetration of spousal abuse by men or the self-reported spousal abuse of women. Similarly, the partner alcohol use (P-ETOH) reported by the respondents, whether they were men or women, did not directly influence either the self-reported perpetration of spousal abuse by men or the self-reported spousal abuse of women. Finally, the self-reported GTC criminality (S-CRIM) of the respondents, whether they were men or women, did not directly increase or decrease the self-reported spousal abuse of women or of the self-reported perpetration of spousal abuse by men.

The third set of influences tested relate to the role of the extended family as a social regulator of spousal abuse, as specifically predicted from the family deterrence hypothesis. In general, the same complex interactions of local density of male kin simultaneously protected women from spousal abuse but empowered men to perpetrate it. By themselves, the main effects of the social support provided by the respondent's family (K-SUPP) and of the socioeconomic status of the respondent's family (K-SES) did not directly influence either the self-reported perpetration of spousal abuse by men or the self-reported spousal abuse of women. By itself, the main effect (MK-DENS) of the local kin density of male relatives on spousal abuse was positive for both men and women, but statistically significant only for men.

However, the two-way, three-way, and four-way interactions were much larger in magnitude than the main effects of local kin density of male relatives, making the total directionalities of these family influences upon men and women diametrically opposed to each other. The effect of the two-way interaction (MK-SUPP) of local kin density of male relatives with family support was significant and positive for the self-reported perpetration of spousal abuse by men but not for the self-reported spousal abuse of women. The effect of the three-way interaction (MK-POWR) of local kin density of male relatives with both family support and family socioeconomic status was significant and

positive for the self-reported perpetration of spousal abuse by men but significant and negative for the self-reported spousal abuse of women. The effect of the four-way interaction (MK-PROT) of local kin density of male relatives with family support, family socioeconomic status, and personal honor was significant and positive for the self-reported perpetration of spousal abuse by men but significant and negative for the self-reported spousal abuse of women. It is important to note that the correct interpretation of these four-way interactions implies that the respondent must have a high local kin density of male relatives *and* high family support *and* high family socioeconomic status *and* high personal honor to produce these higher-order effects and that this is not a completely compensatory model, where more of one component can make up for lack of another. Thus, the reported spousal abuse was partially determined by "sexual balance of power" between multiple higher-order interactions of corresponding family structure parameters of potential victims and potential perpetrators. Thus, the relative social clout of the woman's and the man's extended family, as determined by the interactions of these family structure parameters, partially controls whether and how much spousal abuse might occur within that social context.

Also as expected by the family deterrence hypothesis, none of the main effects or specified interactions of the local density of female kin (FK-DENS, FK-SUPP, FK-POWR, and FK-PROT), were found statistically significant for the self-reported spousal abuse of women. However, the main effect of the local density of female kin (FK-DENS) and that of the four-way interaction (FK-PROT) of local kin density of female kin with family support, family socioeconomic status, and personal honor was significant and negative for the self-reported perpetration of spousal abuse by men. Apparently, the female relatives of the men somehow see it in their interests to partially moderate the sexually coercive tactics of their male family members. However, these moderating effects of powerful female relatives are overwhelmed by the corresponding and contrary effects of their equally powerful male relatives in facilitating their coercive sexual strategy. One final technical note regarding these two contrary effects is that their standardized regression weights both had absolute values greater than 1.0, which is normally the upper bound for standardized regression coefficients (β weights). These are the only coefficients in our model that exceed these normal bounds. This is because the four-way interactions of local kin density of both male kin (MK-PROT) and of female kin (FK-PROT) with family support, family socioeconomic status, and personal honor are highly correlated with each other. In certain cases of highly correlated predictors, standardized regression weights exceeding 1.0 may be produced by an artifact of estimation known as suppression (Cohen & Cohen, 1983). As expected in suppression, the regression weight associated with the four-way interaction of the local density of male kin falls below 1.0 ($\beta = 0.48$), but remains statistically significant and substantial in magnitude, when the corresponding four-way interaction of the local density of female kin is removed from the regression equation. However, because this latter term was also statistically significant, it was retained in the model and duly qualified with this final caveat regarding the necessarily linked interpretation of the additive magnitudes of these two effects.

6. Discussion

Our first major objective was to cross-validate the findings of the original Tucson study (Figueredo & McCloskey, 1993), which we will refer to as the sex, money, and paternity findings for short, in a society where contemporary Anglo-American culture does not predominate. Because the original Tucson sample was composed entirely of women, the appropriate comparison would be to the sample of Hermosillo women. Limiting our initial comparison to this subset of results, we see that the most theoretically important sex, money, and paternity findings were indeed replicated: (1) partner socioeconomic status (P-SES/money) was only an indirect influence on spousal abuse through its correlation with partner mate quality (P-MQ/sex), and (2) partner mate quality (P-MQ/sex) was a significant, substantial, and negative influence on spousal abuse.

CDM was the acronym used to denote "competitively disadvantaged males," or men of low mate quality and low socioeconomic status, who were hypothesized to disproportionately utilize spousal abuse to retain and dominate their mates: (1) the CDM theory of coercive sexual strategy predicted when certain men would use violence to coerce women to provide the CDM with continued or increased sexual access, and (2) the CDM theory of coercive parental strategy predicted when those men would use violence to coerce women to provide the CDM's offspring with continued or increased parental investment. Superficially, the results of this initial comparison between the Tucson and the Hermosillo women would therefore seem to provide cross-cultural support for the CDM theory of coercive sexual strategy but was not able to address the CDM theory of coercive parental strategy, as proposed in sex, money, and paternity (Figueredo & McCloskey, 1993), due to the low base rate of reconstructed families, which include stepchildren as well as genetic offspring, in the Hermosillo sample.

An examination of the results for the Hermosillo men, however, tells a slightly different story from that of the two samples of women. Although these discrepancies were not interpretable as a literal failure to replicate, they did cause us to rethink some of our initial theoretical interpretations. As mentioned above, the constructive replication of the *negative* effect of partner mate quality on respondent-perpetrated spousal abuse was somewhat surprising. This indicated that the spousal abuse perpetrated by our male respondents was being disproportionately directed at competitively disadvantaged *females* (CDFs)! Frankly, we were expecting the opposite. We had originally interpreted the sex, money, and paternity findings to suggest that CDMs would be more threatened in their sexual dominance by a *higher* mate quality partner (cf., Crawford & Johnston, 1999). Instead, the male reports indicate that CDFs are being disproportionately targeted for spousal abuse. This finding was not previously available in the samples composed exclusively of female respondents due to the aforementioned reluctance of individuals of either sex to rate their own mate quality for the interviewers. The question then became why would any mating effort at all, even that of sexual coercion, be expended on retaining and sexually dominating women of low mate quality. Of course, one could counter with the question of why anyone but a low mate quality female would find herself paired with a low mate quality male. In our data, the correlation between ratings of self and partner mate quality was .50; evidently, the answer is that the

women in these abusive relationships must be of disproportionately low mate quality as well. Although clinical folklore has long maintained that many previously abused women tend to somehow pair up with other spousal abusers in their subsequent relationships, this phenomenon might not be the product of an active mate choice. For one thing, the advantages of such a preference would be difficult to imagine. Our prediction from an evolutionary psychological perspective is that individuals would tend to assort on mate quality, not because they do not desire someone higher in mate quality than themselves, but because they cannot hope to keep them if their potential partner is possessed of the same desire (cf., Buss, 1994; Crawford & Johnston, 1999). Thus, if abused women are themselves of disproportionately low mate quality (an observation on which clinicians are generally reluctant to comment), however, the blind forces of the "sexual marketplace" might not permit them access to men of high mate quality as long-term partners. Whether this low mate quality represents a cause or a consequence of the abuse is difficult to determine. Nevertheless, given that CDMs are disproportionately the perpetrators of spousal abuse, clinicians will inevitably observe what superficially appears to be a repeated sexual attraction of certain women (CDFs) to abusive partners.

The motivation of the CDM to perpetrate spousal abuse under these circumstances, however, remains problematical. If his mate cannot obtain a better partner due to sexual market forces, why does he need to practice such escalated tactics of mate guarding? The answer appears to be that low mate quality females have at their disposal a reproductive strategy not available to low mate quality males in many socially monogamous species. Although a CDF may not be able to obtain anyone but a CDM as a long-term partner, she may still be able to obtain a better quality male as a *short*-term sexual partner, thus cuckolding the CDM with whom she is in a long-term partnership. This strategy has been referred to as "gene capture," because the female is obtaining genetic material from a higher mate quality male than she is able to retain for parental investment in her offspring. Higher mate quality males are generally not reluctant to cooperate with this female strategy, as long as they do not have to invest in the CDFs' offspring. Such a situation has been documented in several species of socially monogamous birds (e.g., Kempenaers, Verheyen, Van der Broeck, Burke, Van Broeckhoven, & Dhondt, 1992). It has also been strongly suggested as a human female reproductive strategy in evolutionary models (see Crawford & Johnston, 1999, for the most recent reprise), and immortalized in countless North American country-western songs as well as Mexican ballads (e.g., rancheras). No corresponding strategy is available to the low mate quality males that the CDFs are paired with, whose only available countermeasure is to engage in strategic interference with such "gene capture" tactics by mate guarding, because no higher mate quality female has anything to gain by an extrapair copulation with a CDM, however short-term the encounter. Thus, the CDM theory of coercive sexual strategy has been supported, but in somewhat modified form from our original interpretation of the sex, money, and paternity model (cf., Figueredo, Sales, Becker, Russell, & Kaplan, 2000).

The second major objective of this study was to provide support for the family deterrence hypothesis. The hypothesized protective effect against spousal abuse of the women's extended families was strongly supported. However, it might have been argued that people from larger families are fundamentally different than people from smaller families, whether

due to the effects of behavioral genetics (cf., Rowe, 1994) or of differential socialization (cf., Crawford & Anderson, 1989) within that larger family. Specifically, this argument would propose that people from larger families might naturally engage in less marital conflict (thus contributing to their larger family size), or at least in less extreme forms of conflict than spousal abuse. The presumed "protective" effect of the women's larger kin network would thus be spurious instead of causal. However, the contrary effects of the men's larger kin network in *facilitating* their perpetration of spousal abuse conclusively lays this particular alternative hypothesis to rest. Furthermore, the significance and relative magnitudes of the family structure interactions indicate that these effects are greatly magnified by family support, family socioeconomic status, and personal code of honor. These moderators speak directly to the motivation and the ability of the family to project its collective social power on behalf of the reproductive interests of the respondent, as well as the ideological predisposition of the respondent to call upon that source of coercive social power should the need arise. Uncharacteristically, we can suggest no plausible alternative hypotheses that would account for the significance of such specifically constructed four-way interactions. We conclude that Hrdy (1981) and Smuts (1992) were correct in their predictions.

Furthermore, all of the effects listed above, whether in replication of the sex, money, and paternity model or in support of the family deterrence hypothesis, were obtained while statistically controlling for the spurious correlation components presumably attributable to the five major alternative hypotheses included within the predictive model. These spurious components were the possible confounding effects of the following cognitive and ideological factors: (1) the adherence to the ideology of patriarchy of both the respondent and their partner, (2) the personal code of honor of the respondent, (3) the depression and anxiety of the respondent, (4) the habitual alcohol use of both the respondent and their partner, and (5) the attitudes of the respondent permissive of criminality and favorable to personal risk. Although none of these alternative hypotheses were conclusively rejected as influences on spousal abuse, whether direct or indirect, their inclusion within the regression model did not detract from the significance or magnitude of the evolutionary hypotheses tested. In the case of the respondent's personal code of honor, its inclusion as a moderator substantially magnified the hypothesized effects of the family structure parameters.

A somewhat speculative interpretation for certain effects that were confirmed can be derived from the added presumption of assortative mating on some of these cognitive and ideological dimensions as well as on mate quality, per se. This is because what appear to be purely cognitive and ideological factors might be best interpreted as multiple indicators of an underlying reproductive strategy rather than as independently assorted traits. For example, it has been proposed that certain traits, such as anxiety, depression, substance abuse, and delinquency, all represent different facets of an alternative "high mating effort" reproductive strategy based on low attachment, high sexual promiscuity, low parental investment, early sexual maturation, and high fertility (Belsky, Steinberg, & Draper, 1991; Harpending & Draper, 1988; Rowe, 1996; Rowe, Vazsonyi, & Figueredo, 1997). Furthermore, there exists some empirical evidence for assortative mating on several related psychiatric disorders, such as anxiety disorders, both bipolar and unipolar depression, and alcohol and drug abuse (e.g., McLeod, 1995; Merklingas & Spiker, 1982; Merklingas, Weissman, Prusoff, & John, 1988).

Such alternative strategists might be expected to devalue their partners more, both covertly and overtly, be less sexually faithful to them, and engage in more violent interactions with them, through either provocation or aggression or both (cf., Gangestad & Simpson, 1990). As a result of developing this alternative reproductive strategy, these individuals would also be perceived as less desirable long-term mates by others who might be pursuing more exclusive, higher attachment, reduced or delayed fertility, and higher parental investment strategies. Because prevailing societal norms and values are likely to reflect the interests of the dominant reproductive strategy, individuals possessing traits more appropriate to the alternative strategy are likely to be devalued by sexual market forces. This is probable in any human society, not only due to the numerical preponderance of the mainstream reproductive strategy, but also due to the simple fact that individuals with longer-term, more delayed gratification, and higher parental investment strategies are likelier than others, as a direct consequence of their greater strategic commitment to resource competition, to rise in socioeconomic status and acquire greater social and cultural influence. They therefore wind up making the rules and setting the standards for everyone else, to the detriment of alternative strategists.

Although such interpretations regarding the possible mediating mechanisms by which these various cognitive and ideological factors might operate might be considered speculative, they do not affect the basic findings of this study. However, there are limitations of this study that should be considered. For example, the interactions of the family structure parameters used were actually combinations of measures that were only partially overlapping in explicit content. The local kin densities of male and female relatives were weighted by degrees of genetic relationship, the family support scale referred to relatives of unspecified genetic proximity, the family socioeconomic status scale was based on detailed information from only the most immediate blood kin, and the personal honor scale referred directly to the revenge ideology of the respondent. The decisions for the differential framing of these questions were made based on the trade-off between the depth and breadth of information that could be reasonably collected in an interview format. Some of our interpretations, however, blurred these subtle distinctions by presuming that these family structure parameters generally applied to the same broad group of people. Our justification is that these characteristics, such as socioeconomic status, are known to be highly familial, and that the level of detail available for one subset of family members is likely to generalize well to the entire set. For example, the respondent's self-reported socioeconomic status (S-SES) was highly correlated ($r = .62$) to that of the respondent's immediate blood kin (K-SES), and for that reason was not included as a separate predictor in the structural model. Furthermore, it is the respondent's personal code of honor, as well as that of the respondent's kin, that serves as the primary gatekeeper for whether family coercive power will be brought to bear in any conflict situation. This is because it is generally the respondent that must ultimately either recruit or fail to recruit family assistance in an interpersonal conflict of which the respondent's kin might otherwise not be aware.

In addition, some of our interpretations, such as the assortative mating hypothesis offered above, also treated anxiety and depression as longer-term traits rather than states, whereas the Hamilton (1959, 1980, 1985) scales used, which were originally included only to control for the suspected "negativity" reporting bias (Beck, 1987), only ask explicitly

about the respondent's state of mind during the past two weeks. Our justification for this assumption is that there are meta-analytic, longitudinal, and behavioral genetic studies showing that the predisposition to states of anxiety and depression is largely based on highly heritable temperament and personality traits, such as neuroticism, which are known to be reasonably permanent and stable (e.g., Jorm, 1987; Kendler, Neale, Kessler, Heath, & Eaves, 1993a, 1993b).

Certain conclusions, however, can be made with a greater degree of confidence. For example, contrary to the predictions of the feminist theory of patriarchy, patriarchy did not account for very much in the way of spousal abuse: relatively small and nonsignificant effects on both the self-reports of the victims on the self-reports of the perpetrators. Also, contrary to the predictions of the general theory of crime, general criminality had no significant effects on the spousal abuse reported by either the victims or perpetrators. Certain other effects on spousal abuse of cognitive and ideological factors, such as those of personal honor, anxiety and depression, were somewhat higher. Overall, the various predictions based on evolutionary theory accounted for the greater preponderance of the variance in spousal abuse, even when statistically controlling these presumably extraneous factors. Although no single study, regardless of its scope, can be completely conclusive with regards to our understanding of such complex social processes, we hope that we have made some contribution to explaining the observed differences in prevalence of spousal abuse between different human societies.

Acknowledgments

We wish to thank all our undergraduate and graduate research assistants in Spain, Mexico, and the United States, who have been too numerous to list here, but without which this research would not have been possible. We also thank the Hermosillo Asociación de Mujeres Profesionistas y de Negocios, the Centro Integral de Attención para Mujeres, the Bufete Jurídico de la Escuela de Derecho de UNISON, and the Alberto Gutierrez and Cruz Galvez schools, for their cooperation in referring us to parents of learning disabled and conduct disordered children for our interviews. Portions of this research were partially funded by a Minority International Research Training (MIRT) Grant (TW00036) from the National Institutes of Health/Fogarty International Center to the University of Arizona, a Foreign Travel Grant from the Office of International Programs of the University of Arizona, and a Small Grant from the Office of the Vice President for Research of the University of Arizona Foundation. We also thank José Antonio Corraliza, María Ángeles Gilmartin de Castro, María del Carmen Valiente-Ots, and Patricia Villavicencio-Carrillo for hosting and helping our team during the Madrid Pilot Study at the Universidad Autónoma de Madrid and the Universidad Complutense de Madrid in the summer of 1995. We especially want to thank David Buss, Leda Cosmides, Charles Crawford, Denise Cummins, Martin Daly, Steve Gangestad, William James Jacobs, Mary Koss, Neil Malamuth, Lewis Petrinovich, David Rowe, Rebecca Sage, Randy Thornhill, John Tooby, and Margo Wilson for their invaluable conversation, constructive criticism, and encouragement of this research program over the years.

Appendix A. Items used in author-constructed or carved-out scales (with response formats/categories in italics)

A.1. P-MQ

Does your husband/partner live in the same home with you?
No/Yes
Did your husband/partner marry you?
No/Yes
How jealous is your husband/partner?
Not jealous at all/Slightly jealous/Very jealous/Excessively jealous
How much do you think he loves you?
Not at all/A little/A lot
How satisfied are you with the sex life you have with your husband/partner?
Not at all satisfied/Slightly satisfied/Generally satisfied/Very satisfied/Completely satisfied
Compared to other men that you know, how would you describe your husband/partner physically?
Much less attractive/Somewhat less attractive/Somewhat more attractive/Much more attractive
Compared with other men that you know, how intelligent a person would you say that your husband/partner is?
Much less intelligent/Somewhat less intelligent/Somewhat more intelligent/Much more intelligent
Compared with other men that you know, how good a person would you say that your husband/partner is?
Much less good a person/Somewhat less good a person/Somewhat more good a person/Much more good a person

A.2. P-SES/K-SES (Partner, father, mother, brothers, sisters)

What are the educational levels of the following people. . .?
No schooling: Cannot read or write/No schooling: Can read and write/Elementary school not completed/Elementary school completed/Middle school or trade school not completed/Middle school or trade school completed/High school, preparatory or technical school not completed/High school, preparatory or technical school completed/College (bachelor's degree) not completed/College (bachelor's degree) completed/Master's degree not completed/Master's degree completed/Doctoral degree not completed/Doctoral degree completed
What are the occupations of the following people. . .?
Self-Employed/Employed/Not employed/Retired/Homemaker/Student
What is the professional level of the following people. . .?
Not employed/Unskilled laborer/Skilled laborer/Administrative employee or equivalent/Middle management, supervisor, foreman/Upper management of administration or business

To which social class do you think that the following people belong. . .?
Low class/Lower middle class/Middle class/Upper middle class/Upper class
How much do each of the following people earn monthly. . .?
0 pesos (0 Mexican minimum wages)/600 pesos (1 Mexican minimum wage)/1200 pesos (2 Mexican minimum wages)/1800 pesos (3 Mexican minimum wages)/2400 pesos (4 Mexican minimum wages)/3000 pesos (5 Mexican minimum wages)

A.3. S-PATR/P-PATR

Please indicate your level of agreement with each of the following statements. Afterwards, indicate how much you think that your partner would agree with each one of these same statements:
Disagree strongly/Disagree slightly/Neither disagree nor agree/Agree slightly/Agree strongly
The ultimate authority in the house is the father/husband.
A woman should obey her husband.
It is all right for a man to punish his woman/wife if she is not obedient.
The law should not intervene in conflicts between husband and wife.
The man is the most appropriate person to make decisions in the house.
A woman should not question the orders of her husband.
Women were born to obey their husbands.
A woman should expect neither all a man's love nor all a man's money.
The government should not interfere in family matters.
Fathers have the authority in the family and no one should challenge it.
The head of the family can use physical punishment with any members of the family that do not obey him.

A.4. S-HONR

Imagine that a person finds himself/herself in the following situations. Please tell us if this person:
Did much less than was justified/Did somewhat less than was justified/Did neither more nor less than was justified/Did somewhat more than was justified/Did much more than was justified
A man punches a drunk who bumped into the man's wife on the street.
A woman shoots another person because that person had sexually assaulted the woman's sister.
A man seduces the daughter of another person because that person had seduced his 16 year-old daughter.
A woman stabs an adult male stranger who had previously beaten up her mother.
A man fights a friend when they are having an argument because his friend called him a liar and a coward to his face.
A woman insults another person because that person calls her a liar and a cheat.

A man fights an acquaintance for looking over the man's girlfriend and talking to her in a suggestive way, even if she was not offended by it.
A woman fights another woman who deeply insulted her in public.
A man hits a woman back for slapping him in the face when he gets fresh with her.
A woman reveals a female friend's secrets because that friend has offended her.
A man fights an acquaintance because that acquaintance looks over the man's girlfriend and starts talking to her in an offensive way.
A man punches an adult stranger who was in a protest march showing opposition to the man's views.
A woman hits a man who stole a statue of the Virgin Mary from her church.

A.5. S-ANXI

In the past two weeks, how many days have you been or had...
Trembling?
Sweating?
Tension?
Restlessness?
Itching?
Less energy or more easily tired than usual?
Trouble sleeping, either more or less than usual?
Muscle spasms?
Rapid or irregular heartbeat?
Pressure in your chest?
Stomach ache?
Any change of appetite, eating much more or less?
Constipation?
Dizziness?
Headaches?

A.6. S-DEPR

In the past two weeks, how many days have you felt...
Depression or sadness?
Guilt for things that have happened to you in your life?
That it would be better to die or commit suicide?
Bad for having failed at something?
That it was more difficult to do your work?
Loss of interest in things that you normally like?
Any change in your sexual interest, either more or less than usual?
Trouble concentrating?
Worried about things to the point that you couldn't stop thinking about them?

That you were easily startled?
Suspicious of others?

A.7. S-ETOH

How often do you drink alcoholic beverages, for example, wine, beer, or liquor, on weekends?
Never/Only on special occasions/Once in a while/Almost every weekend/Every weekend/Only with meals
How often do you drink alcoholic beverages, for example, wine, beer, or liquor, on weekdays?
Never/Only on special occasions/Once in a while/Almost every weekday/Every weekday/Only with meals
How much do you drink on each occasion, for example, glasses of wine, glasses of beer, wine, or liquor?
She doesn't drink/1 or 2 glasses of wine, 1 or 2 glasses or cans of beer, 1 or 2 mixed drinks/3 glasses of wine, 3 glasses or cans of beer, 3 mixed drinks/4?6 glasses of wine, 6 glasses or cans of beer, 6 mixed drinks/Drinks in quantities more than 6 glasses or cans

A.8. P-ETOH

How often does your husband/partner drink alcoholic beverages, for example, wine, beer, or liquor, on weekends?
Never/Only on special occasions/Once in a while/Almost every weekend/Every weekend/Only with meals
How often does your husband/partner drink alcoholic beverages, for example, wine, beer, or liquor, on weekdays?
Never/Only on special occasions/Once in a while/Almost every weekday/Every weekday/Only with meals
How much does your husband/partner drink on each occasion, for example, glasses of beer, wine, or liquor?
He doesn't drink/1 or 2 glasses of wine, 1 or 2 glasses or cans of beer, 1 or 2 mixed drinks/3 glasses of wine, 3 glasses or cans of beer, 3 mixed drinks/4?6 glasses of wine, 6 glasses or cans of beer, 6 mixed drinks/Drinks in quantities more than 6 glasses or cans

A.9. S-CRIM

Listed below are a number of statements that describe attitudes that different people have. There are no right or wrong answers, only opinions. Read each item and decide whether you:
Disagree strongly/Disagree slightly/Neither disagree nor agree/Agree slightly/Agree strongly

It's okay to get around the law if you can get away with it.
Most things that people call delinquency don't really hurt anyone.
To get ahead, you have to do some things that are not right.
Cheating and lying are always wrong, no matter what the situation.
If I don't follow the rules, I feel guilty.
Whatever I do, I try hard.
I try to get the things I want even when I know it's causing problems for other people.
I often do whatever brings me pleasure here and now, even at the cost of some future goal.
People who break the law are almost always caught and punished.
I see no need for hard work.
I don't devote much thought and effort to preparing for the future.
I care about what other people think of me.
Sometimes I take risks just for fun.
I try to save as much money as I can.
I like to test myself by doing risky things.
Hitchhiking is too risky for me.

A.10. Spousal abuse (PIEF version of CTS)

Now we will ask you some questions about the kind of conflict that can at times occur in some couples. Please tell us how often the following things have happened between you and your husband/partner.
During the past 12 months...
(VERBAL)
How many times have you and your husband/partner had strong arguments?
How many times have you thought about leaving him?
How many times have you felt criticized by him?
How many times have you felt ignored by him or have you felt that he didn't care?
How many times has he insulted you or said bad words to you?
How many times has he refused to talk about some problem?
How many times has he left the house in a violent manner?
How many time has he said or done something to cause problems for you?
How many times has he threatened you saying that he was going to hit you or throw something at you?
How many times has he threatened to commit suicide?
How many times has he threatened you saying that he was going to harm the children?
How may times has he threatened you saying he was going to take the children?
How many times has he wounded or killed a family pet?
How many times has he told you that he was going to kill you?
How many times has he torn your clothes or broken your things?
How many times has he invaded your privacy, opened your mail, listened to your telephone conversations, or spied on you?

(PHYSICAL)
How many times has he thrown something at you?
How many times has he pushed or grabbed you violently?
How many times has he slapped you?
How many times has he kicked you, punched you, or bitten you hard?
(ESCALATED)
How many times has he hit you or tried to hit you with some object?
How many times has he beaten you for several minutes?
How many times has he tried to strangle you?
How many times has he threatened you with a knife or a handgun
How many times has he stabbed you or shot you with a handgun?
How many times has he burned you with a cigarette or some other hot object?
(SEXUAL)
How many times has he forced you to have sex with him against your will?
How many times has he forced you to have oral or anal sex with him against your will?

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