

## Bridewealth

In our discussion of sexual selection we used the “cost of reproduction” as kind of metaphor for understanding gender differences in sexual motivation. The theory alludes to receptive females as a kind of scarce commodity that males compete over. Human reproduction is not only metaphorically economic. In many societies the commodification of women is institutionalized in a practice called bridewealth or brideprice. **Bridewealth** is a payment that a man or his family makes to a woman’s family for rights to sexual “access” and rights to the products of her labor and her children’s labor. In fact the majority of traditional societies around the world have some form of bridewealth (figure 1).

- Bridewealth is the opposite of **dowry** (a payment to the groom’s family).
- **Brideservice** is a form of bridewealth in which a man works for his wife’s family for a period of time (often several years) in exchange for marriage.
- **Sister exchange** is when two men marry each other’s sister.

### Figure 1. Types of Economic Transactions at Marriage Across Cultures

We might try to understand bridewealth in terms of evolutionary theory. In particular, we might ask what factors affect a woman’s “reproductive value”?

**Life history theory** is a branch of evolutionary biology that deals with tradeoffs in the timing of reproductive events and the allocation of “effort” or resources to reproduction, growth, development and self preservation. “Reproductive value” (or “residual reproductive value” or RV) is an important life history concept referring to the number of offspring that an organism (usually a female) can expect to produce over the remaining course of her life. (1) Age is one obvious determinant of reproductive value: A 19 year old woman might expect to have as many as 10 offspring in the rest of her life, while a 60 year old woman can’t expect to have any more offspring. (2) Physical condition might also affect reproductive value: Women in good condition should be able produce more offspring, while women in poor condition would have fewer offspring. If we convert reproductive value into bridewealth payments, then we should expect younger women in better condition to fetch higher bridewealth than do older women in poorer condition.

Recall, however, that ability to reproduce is not the only consideration that a male has when he decides whether or not to invest in a particular relationship. One important consideration is whether the potential mate is likely to be faithful. Any sign of potential infidelity (like promiscuity) should be cause for concern. So, we expect men (and their families) to pay less for women whose potential fidelity is questionable.

People don’t only have reproductive value, they have economic value too. A woman’s economic contribution to her family might then influence her bridewealth.

### Pregnancy: Morning sickness and its evolutionary benefits?

Imagine having a hangover for three months straight. Every time that you eat something, you feel like you are going to throw up. And sometimes you do. You don’t want to get out of bed, because you feel sick when you move. If someone else is cooking in the house, the smell of onions, garlic, coffee, tomato paste, meat, hot peppers, or almost any spice makes you lose your appetite. If you smell a cigarette when you are walking down the street, another wave of nausea hits. On some days, the only thing you can barely manage to choke down are some dry crackers. At the same time that you are nauseous, you are also very hungry. You can’t stop salivating, and there is constant terrible taste in your mouth. Anytime you can, you need to lie down, close your eyes, and stay as motionless as possible. This is the experience for many pregnant women, but not all. It is a condition called “morning sickness” or “pregnancy sickness”. Why would women evolve to be so incapacitated and unable to eat during pregnancy, a time when you might expect them to need to put on calories to help nourish their growing embryo?

Although it seems odd, in fact, morning sickness, or pregnancy sickness, is a very common condition for women during the first trimester of pregnancy. It is universal across human cultures, with about 50% of women experiencing some degree of symptoms. These may be from mild nausea to frequent dry heaves and vomiting, and, contrary to the common name, the queasiness can occur at any time of the day, or throughout the entire day and night. Women experiencing pregnancy sickness may not be able to eat much, and may have many aversions to foods that they normally like. Pregnancy sickness is associated with fatigue or extreme tiredness, and it usually ends by the end of the first trimester, although some women experience it throughout their pregnancy.

Could there be evolutionary benefits to morning sickness, which outweigh the costs of lowered nutrition and productivity?

Evolutionary biologist Profet decided to research morning sickness across human cultures to answer this question. She found several lines of evidence that suggest, in fact, morning sickness may be adaptive, both for the pregnant woman and for the child inside her.

Profet showed that nausea is usually a protection against eating toxins. She hypothesized that morning sickness protects women against eating or digesting food with toxins harmful to the developing fetus. Plant toxins in dosages that adults tolerate can cause birth defects and induce abortion when ingested by pregnant women. It turns out that morning sickness begins when the embryo is most vulnerable to birth defects. Also at this time, the embryo has only a modest need for nutrients. Morning sickness usually ends at about the same time that the embryo's organ systems are nearly complete, and now its biggest needs are nutritional.

The foods that pregnant women tend to avoid are most often bitter, pungent, highly flavored, and novel foods. These are the most likely foods to contain toxins that could be harmful to the fetus. Another interesting finding is that women's sense of smell is heightened during morning sickness months, and less sensitive than normal later in pregnancy. This suggests that women may be able to detect toxins best, using olfactory cues, exactly during the time when morning sickness is most common.

Profet further argued that people who practice a hunter-gatherer lifestyle would be most at risk for toxin ingestion due to wild plant use. This suggests that the evolutionary benefits of morning sickness, in causing women to avoid eating toxic substances during the stage of development when her fetus was most at risk for miscarriage or acquiring developmental defects, would have been particularly important for early humans because of their dietary lifestyle.

When examining medical histories, Profet found that currently, women with more severe morning sickness are less likely to miscarry compared to women without morning sickness symptoms. Women with more severe morning sickness are also less likely to bear babies with birth defects. This is strong evidence that morning sickness symptoms might offer some type of protection to the fetus, through changing mothers' behavior during the most vulnerable period for the development of the fetus.

Mothers often face a critical choice between childcare and work. Trade-offs between parenting and production create pressure for cooperative childrearing among humans. Nursing often taxes mothers' time and energy in ways that other childcare does not; hence, parental cooperation may be particularly important during lactation (Marlowe 2003). A child's father may be especially well situated to assist the nursing mother because he and the mother share identical genetic interest in their children's success. Other potential helpers do not share such "symmetrical" interests with a child's mother. In this study we use cross-cultural data from 58 "traditional" societies to test the hypothesis that pair-bonds are more supportive of lactation than are other kin relations.

Breastfeeding is a primary mechanism among mammals for provisioning dependent offspring, and it is a key component of "parental investment" (PI hereafter). PI is defined as care benefiting one offspring at a cost to parents' ability to invest in other components of fitness – including mating effort, and investment in other offspring and genetic kin (Clutton-Brock 1991: 9; Trivers 1972).

For mothers, lactation entails energetic and opportunity costs, and suppresses fertility (Valeggia & Ellison 2001; Tracer 1996; Vitzthum 1994). Human lactation requires 670 kcal/day during exclusive breastfeeding (Dewey 1997). Increased energy demand presents costs to household production, and may delay future reproduction through reduced fecundity (Jasienska 2001). Breastfeeding may suppress postpartum ovulation through effects on gonadotrophin-releasing hormone (Vitzthum 1997). Costs of breastfeeding for future reproduction or "residual reproductive value" indicate life history trade-offs. Reduction of residual reproductive value suggests that to enhance fitness most mammals should wean their offspring as soon as possible. However, effects of lactation on human fecundity diminish as breastfeeding continues. For example, in one study 50% of well nourished nursing women returned to reproductive cycling within 10 months of giving birth, and 100% of lactating women returned to cycling within 20 months (Valeggia & Ellison 2004:588; see also Holman et al. [2006] for similar findings), which is 10 months earlier than the cross-cultural average age at weaning at 30 months (Dettwyler 1995). Resumption of cycling while lactating might account for shorter inter-birth intervals among humans compared with other great apes (Kennedy 2005). Comparatively reduced reproductive cost of lactation among humans may suggest that energetic costs can be reduced by provisioning. Opportunity costs also can be substantial (Quinlan, Quinlan & Flinn 2003): Nursing often interferes with women's work that may benefit other children or kin. We suggest that opportunity costs rather than costs to residual reproductive value are the major force driving human weaning decisions.

Weaning should occur when the maternal fitness costs of continued breastfeeding exceed the benefits. In general, a woman's access to resources for PI determines the costs of continued breastfeeding. Easy access to resources may allow mothers to spend more time in direct childcare including nursing because their time is not limited by labor demands. Coresident adults can make economic contributions to households that allow women to spend less time working outside the home or camp and more in direct childcare including breastfeeding.

Human weaning shows comparatively unusual features. Other great ape species wean at about 5 to 7 years (Dettwyler 1995; Kennedy 2005). Based on allometric relationships between adult size (Charnov & Berrigan 1993), molar eruption (Smith 1992) and weaning age among primates, humans are predicted to wean at about 6 years, although other methods give estimates between 2.5 to 7 years (Dettwyler 1995). Despite predictions for late weaning among humans, cross-culturally the average and median age at weaning is

around 2.5 years (Dettwyler 1995; Kennedy 2005; Sellen 2001). These data indicate that the average age for human weaning may be at an adaptive minimum; hence, in many environments the challenge is not to find ways to reduce lactation, but rather to extend it. We suggest that maternal social support provides a solution for the unusual challenge of human lactation.

Provisioning infants with energy is not the only or perhaps even the most important function of human breastfeeding. Availability of weaning foods is not associated with age at weaning cross-culturally (Sellen and Smay 2001), suggesting that considerations other than feeding are in play. In fact, because of expensive brain growth, breastfeeding alone may not support infant nutritional needs much beyond 6 months (Kennedy 2005; McDade & Worthman 1998; Wilson et al. 2006). Many other health benefits of breastfeeding, such as resistance to infections and allergies, are well-known (Oddy, 2001; Leon-Cava, Lutter, Ross & Martin 2002). Prolonged nursing may also have positive influence on long-term psychomotor and neural development in well nourished populations (Horwood, Darlow, & Mogridge, 2001; Pollack, 1994; Vestergaard et al., 1999). Breastfeeding duration has also been associated with long-term reduction in children's stress hormone levels (Quinlan et al. 2003), and increased "developmental stability" (Leone et al. 2004). Furthermore, breastfeeding may have protective effects against diseases appearing later in development and adulthood (Cunningham, 1995). Nursing can be important to the mother-child bond, associated with positive emotions and attachment linked to maternal hormones including prolactin and oxytocin (Ellison 2001 pp. 83-126). Maternal responsiveness, related to nursing, appears to influence the development children's attachment styles and later conjugal relations as an adult (Belsky 1997; Chisholm 1996). Hence, breastfeeding – and its underlying hormonal correlates – may play role in attachment organization (Else-Quest, Hyde & Clark 2003; Insel 2000). These findings suggest fitness benefits beyond mere energy provisioning, which cannot easily substitute alloparental care for nursing.

Age at weaning is influenced by the distribution of household labor (Quinlan, Quinlan & Flinn 2003, 2005). A study of 133 preindustrial societies suggests that maternal work patterns, subsistence strategies, and the reproductive costs of prolonged lactation affect breastfeeding duration (Sellen & Smay, 2001). Relatively long daily separations between mothers and infants may lead to earlier weaning by single-mothers, similar to reported earlier weaning for working-women in developed countries (Lindenberg, et al 1990; Bouvier & Rougemont, 1998; Bick et al., 1998; Hill, Humenick, Argubright, & Aldag, 1997; Arlotti, Cottrell, Lee, Curtin, 1998; Fein & Roe, 1998; Visness & Kennedy, 1997). Support mothers receive from potential alloparents may affect their work and breastfeeding patterns. Kinswomen appear to be more willing to help each other with childcare than with other work (see Leonetti, Nath, Hemam & Neill 2004). Breastfeeding, however, is usually beyond the scope of alloparenting. Leaving a baby with a kinswoman prolongs periods of mother-child separation, which may hasten weaning in households with coresident alloparents (Quinlan, Quinlan & Flinn 2003).

References in Quinlan, R., & Quinlan, M. (2008). Human Lactation, Pair-bonds, and Alloparents. *Human Nature*, 19(1), 87-102.

## Outline of human pregnancy and lactation:

### Labor and Birth

#### Stages of labor

- Bloody show
- Waters breaking
- Cervical dilation
- Contractions
- Pushing the baby out
- Birth of the placenta
- Involution of the uterus

Outside the U.S., women give birth at home attended by a midwife. In the U.S., 95% of women give birth in a hospital. The birth process is a normal physiological event; for a normal, healthy woman, 92-95% of births are normal. The 20th century U.S. view: **pregnancy is a physiologically dangerous, pathological state** where the pregnant woman is placed in the sick role. In U.S., about 20% of births end in Cesarean sections.

#### Medical Procedures and Interventions

- Pubic shaving and enemas
- Immobility and lying down
- Rupturing the amniotic sac
- Routine intravenous infusions
- Pitocin for induction of labor
- Fetal monitors
- Routine episiotomy
- Vacuum extraction (or forceps)
- Pain relief (anesthesia, narcotics, barbiturates)