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Postpartum Depression: An Evolutionary Perspective

Mark Tracy

Abstract: There is no common consensus among theorists regarding the nature and purpose of postpartum depression. Evolutionary theorists have proposed that the onset of postpartum depression is an adaptive function that signals a potential fitness cost to the mother i.e. the investment in the child will be cost more than the evolutionary benefits to be gained from rearing this child. Many studies have shown that there is a strong correlation between postpartum depression and lack of paternal or social support indicating that when these two variables are absent the mother is more likely to experience postpartum depression. In this paper I hope to outline the evolutionary approach to postpartum depression, discuss the various possible social situations that would predict the absence or presence of postpartum depression and review the cross-cultural literature to see if this evolutionary perspective holds up as a universal across all cultures.

Mothers with postpartum depression (PPD) commonly have thoughts of harming their children, exhibit fewer positive emotions and more negative emotions toward them, are less responsive and less sensitive to infant cues, less emotionally available, have a less successful maternal role attainment, and have infants that are less securely attached. PPD is a depressive episode with onset occurring one month postpartum (APA 1994).

Postpartum depression (PPD) has been somewhat of an anomaly to the clinical and scientific community. Theories concerning the occurrence of postpartum depression have often failed to account for the cross-cultural differences in the manifestation of PPD. There has been a long standing argument as to whether PPD is a universal disorder or a culture-bound syndrome that appears in some cultures and not others. This paper seeks to understand postpartum depression from a relatively new angle: that of evolutionary theory. Evolutionary theory understands PPD not as a dysfunction, as the above American Psychiatric Association implies, but rather as an adaptive mechanism that signals to a mother that she is suffering or has suffered a social cost which motivates her to evaluate whether to continue to or cease to provide care to her offspring. Intuitively, it sounds odd that such an
unpleasant and seemingly disruptive experience could be adaptive and selected for by natural selection. Williams and Nesse (1991) argue that the medical tradition’s reliance on chemistry and physics offer proximate explanations for disease and illness while evolutionary biology understands the ultimate cause of many modern illnesses and diseases. They claim that many of the manifestations that we consider maladaptive consequences or byproducts (physical pain, swelling, vomiting, allergic reaction, fever, etc.) of illness or disease are in fact adaptive mechanisms to help the body recover more effectively. For example, when an individual sprains his or her ankle and swelling occurs, the physician regards this swelling as an incidental result of trauma, while the evolutionary biologist seeks to understand the adaptive nature of the swelling. In other words, swelling is adaptive in that it inhibits movement of that particular joint and thus expedites the healing process. Also, the sequestration of iron, understood from an evolutionary perspective, is a defense mechanism where the body lowers its iron levels in order to deprive bacteria from a vital mineral.

Nausea and allergies are understood as evolved mechanisms that are representative of the plant-herbivore arms race where toxins were selected for by plants and allergies and nausea are the defense mechanism herbivores utilize to avoid certain toxic plants. Understanding illness and disease from an evolutionary perspective calls into question modern medicines application of certain medicines that may inhibit certain adaptive processes (aspirin for swelling, antihistamines for allergies, and supplements for iron suppression). It therefore follows that an evolutionary perspective may have a lot to offer in the application of more appropriate healing techniques that do not inhibit the processes selected for by evolution. This paper addresses the adaptive nature of PPD, and assesses some of the cross-cultural literature, and evaluates, whether evolutionary theory is appropriate for understanding PPD cross-culturally.

Edward Hagen (1999), an evolutionary anthropologist who has studied PPD extensively argues that PPD’s close association with child bearing and rearing warrants it applicable to parental investment theory (PI), an aspect of life-history theory. Life-history theory argues that in order for our ancestors to successfully pass on their genetic material, they would have had to solve the problems of survival, growth and development, and reproduction. Because each of these represents unique problems, and that time, energy and resources are finite, organisms essentially had to weigh the costs and benefits of allocating investment between somatic effort and reproductive effort. Reproductive effort can also be broken down into parenting effort (providing for and raising children) and mating effort (finding the
appropriate mate) whereby the organism calculates the allocation of resources, time and energy in a fitness enhancing way. Consequently parents will size up their current situation and environment and will have to decide between investing in themselves (somatic), their offspring, or mating opportunities in order to best enhance their fitness. Thus, the investment in a newborn baby is not automatic, as there will be certain circumstances in which investment in a newborn child will be more costly than investing elsewhere.

In a paper titled *The Functions of Postpartum Depression*, Hagen (1999) addresses two predictions regarding PPD that follow from PI. First, if and when an offspring requires significant investment, the mother should evaluate the viability of the offspring before she invests. Second, if the offspring requires a significant amount of investment from the mother *as well as the father* in order to survive, she should evaluate how much the father will actually invest before investing herself. These two predictions are consistent with the correlates that are most often associated with PPD: lack of support from the father and complications during birth or pregnancy. Hagen notes that PI theory accounts for why a woman might neglect, kill or abandon a child under these circumstances but it is not clear why she is likely to experience depression.

In preindustrial populations, carrying and rearing a child is a very costly and taxing experience due to the large amount of resources, time, and energy that it takes to foster the growth and development of the brain. Human infants also require years of direct care after they are born as they are dependent on the mother for protection and food for growth and development of the brain. It is clear that the decision to invest in a child is not only extremely important, but also “a necessary functional component of the mother’s decision-making process is information on whether her costs are exceeding her benefits.” (Hagen 1999; 332)

The physical makeup of the human body is the net result of numerous adaptations that have evolved because of their particular purpose in solving the problems of reproduction and survival. Evolutionary psychologists argue that the brain evolved in the same way with a number of adaptations, designed by natural selection, that solve reproductive problems (Barkow et al. 1992; Daly & Wilson 1983, 1984; Symons 1979). One example of this is physical pain; theorists believed physical pain was an adaptation that evolved to inform an individual that a part of their body is being damaged, to motivate them to stop the behavior causing the damage, and condition the individual to avoid similar circumstances in the future.
Many evolutionary researchers (Alexander 1986; Hagen 1999; Nesse 1991; Nesse & Williams 1995; Thornhill & Thornhill 1989, 1990; Tooby & Cosmides 1990), in an attempt to determine the “function of psychological distress, neuroses, and depression that would compensate for their obvious costs” (Hagen 1999: 333), have likened psychological pain to that of physical pain. Where physical pain informs the individual that they are suffering a bodily injury, psychological pain informs the individual that they have suffered or are suffering a non-bodily injury or “social injury”. Like physical pain, this psychological pain motivates the individual to stop engaging in behavior and avoid similar harmful situations in the future. Thus, the function of PPD hypothesized by Hagen is that sad or depressed mood is a signal to the mother that she is suffering or has suffered “net reproductive fitness costs over evolutionary time” (Hagen 1999: 333).

Evolutionary theory predicts that 1) a mother does not automatically invest in every child; 2) a mother is constantly evaluating the fitness costs and benefits of investing in herself, her offspring, or her mating opportunities. In the event that the cost of raising a child outweighs the fitness gains of rearing that child, she will reconsider investing in that child. In other words, she may defect her care and consider investing in other fitness enhancing behaviors, such as providing care for her other children. Evolutionary theorists believe that PPD was the initial indication to the mother that she has or will suffer a fitness cost. The low mood and lack of bond that is associated with PPD essentially gave the mother the tools to defect from raising that particular child.

In the defection hypothesis, Hagen hypothesizes that the following etiological factors that would impact of whether or not to invest in a child. These circumstances would correspond to an affective state that would signal the appropriate decision for the mother and thus predict PPD.

1. There is insufficient investment from the father or others to successfully raise the offspring.
2. There are problems with pregnancy, birth, or with the infant that indicate that this offspring may have low viability, that is, is unlikely to survive to reproductive age.
3. Environmental conditions are poor for raising an offspring (e.g. harsh winter, insufficient resources).
4. There are large opportunity costs-investment in the offspring precludes investment in other beneficial activities. In this case, investment directed toward the offspring would be more profitably directed toward:
Existing offspring

The mother’s own survival, growth, and development, and thus her ability to invest in future offspring

Finding a better mate (Hagen 1999).

Hagen further proposes that the defection hypothesis produces five predictions pertaining to PPD. The first prediction states that lack of social support should be associated with negative affect (sad or depressed mood). He argues that the correlation between PPD and lack of spousal support is “virtually undisputed”. This is highlighted in a study done by Field et al. (1985) explaining that postpartum mothers are more likely to exhibit depressive features if they are single, have marital problems, and have felt that their husband did not love them. O’Hara (1985) also showed that marital satisfaction scores obtained by fathers were strong predictors of PPD.

The second prediction of the defection hypothesis is that poor infant viability should be associated with negative affect. Complications prior to or at birth are an indication that the viability or health of the child is at risk. It is therefore predicted that if the infant is perceived to require extra effort that will not guarantee enhanced survivorship, the mother will experience the onset of depressive symptoms that motivate her to reevaluate her investment in her child (Hopkins et al. 1987). There is a strong correlation between depressed mothers and pregnancy complications.

The third prediction of the defection hypothesis is that poor environments should be associated with negative affect. If mothers live in marginal and hazardous environment or they are unable to obtain the resources necessary to raising a newborn they should consider reevaluating their investment and use the available resources to invest in already born offspring or their own somatic growth and health. Therefore we would expect that low resource availability and hazardous environments should predict negative affect. Unfortunately there is not available data to test this prediction; further research will clarify this point.

The fourth prediction of the defection hypothesis claims that PPD should be universal. This does not mean that PPD will be found in all societies, if there is sufficient social support, there are relatively low or no social costs for defecting, the environment is conducive to predictably reproducing a viable offspring, and in general there are few costs for raising a child, PPD should be low. This prediction, and the available literature about it, will be discussed extensively below.

The last prediction of the defection hypothesis is that PPD is not a hormonal byproduct of pregnancy. The most commonly held folk
belief is that PPD is a consequence of changes in hormone levels that come with pregnancy. In spite of this, research reveals (Harris 1994; O'Hara 1995) that changes in hormonal levels have little or nothing to do with PPD.

As noted above, evolutionary theorists regard psychological pain as an evolved psychological mechanism that signaled to the individual that they suffered or are suffering a social cost or injury. It is believed by Hagen and others that PPD might be a result of this mechanism, aiding the mother in the decision of whether or not to invest in her child. They call this the perinatal psychic pain hypothesis, in other words, if a mother is subject to the circumstances listed above during pregnancy she should experience perinatal sadness and a lack of desire to raise the child, motivating her to evaluate whether or not to invest or seek social and material resources so she has the wherewithal to raise the child.

In an attempt to provide evidence for the theory that psychological pain is an evolutionary adaptation that should not be regarded as a psychological dysfunction, Hagen and Barrett (2002) conducted a study on Shuar women. They choose the Shuar in an attempt to emulate the conditions and social arrangements of the Environment of Evolutionary Adaptiveness (EEA). The Shuar are a small, kinship-based and subsistence economic group that most accurately mirrors the type of group that the evolutionary forces worked on in the EEA, as a study done on the child anthropometry of the Shuar revealed that increasing family sizes in this village had a negative impact on children's skeletal growth, weight, levels of body fat and muscle development (Hagen et al. in press). Thus, the Shuar women live in conditions that would best predict the onset of perinatal psychic pain as they are faced with investment decisions upon being pregnant.

Hagen and Barrett wanted to identify: (1) If Shuar women experience negative emotions during or following childbirth, and how they explained them and; (2) if the mother's explanations could be understood by perinatal psychic pain hypothesis; and (3) they wanted to test the prediction that negative perinatal emotions would be strongly correlated with lack of desire for the child, predicted by the psychic pain hypothesis.

Hagen and Barrett asked 21 Shuar mothers to describe their feelings and experiences of childbirth. In order to control for the potential culture-bound difference in meaning of "depression", they decided instead to ask mothers if they were simply "sad" during or after the pregnancy of their youngest child and why. They also asked if the mothers wanted the child and why or why not.
They found that 62% of women reported being sad during pregnancy while 33% reported being sad following pregnancy. All but one of the reasons (wrong sex) given for sadness during pregnancy could be explained by the perinatal psychic pain hypothesis, falling under some variation of lack of social support, poor maternal health or a perceived opportunity cost.

<table>
<thead>
<tr>
<th>Reasons Given for Sadness Postpartum</th>
</tr>
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<tbody>
<tr>
<td>Lack of social support</td>
</tr>
<tr>
<td>1. Problems with relationship, worried about impact of other children.</td>
</tr>
<tr>
<td>2. Husband hadn’t returned from long trip.</td>
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<tr>
<td>3. Husband left</td>
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<tr>
<td>4. Father of child had left</td>
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<tr>
<td>Lack of resources</td>
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<tr>
<td>5. Child wouldn’t have clothes or other things</td>
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<tr>
<td>Wrong Sex</td>
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<tr>
<td>6. Wrong sex</td>
</tr>
<tr>
<td>Infant Health Problems</td>
</tr>
<tr>
<td>7. Newborn had severe health problems</td>
</tr>
</tbody>
</table>

Hagen & Barrett (under review)

As they predicted desire for child was strongly associated with pregnancy sadness as 72% of mothers who did not want their child experienced sadness while only 29% of those who wanted their child reported sadness. Hagen and Barrett conclude that their study found support for the elicitation of perinatal sadness in women whose fitness costs outweigh their benefits “in a population of hunter-horticulturalists where increasing family size has been documented to have a significant negative impact on child nutrition and growth” (Hagen et al., in press).

Although the psychic pain hypothesis accounts for the occurrence of minor depression is does not account for the most serious symptoms of depression, i.e. loss of interest in most activities, weight loss or gain, hypersomnia, psychomotor retardation, fatigue, loss of energy, and suicidal ideation (APA 1994). For women living in ancestral times these symptoms would impede women from fulfilling the daily tasks that were essential to their own as well as the group’s survival. As Hagen (2002) notes that the “close association of apparently functional symptoms with seemingly dysfunctional symptoms calls into question a functional account of depression as a
whole” (Hagen 2002: 324). In other words, the psychic pain hypothesis proposes that sad affect (minor depression) has adaptive properties in its ability to inform the individual that they are suffering a social cost or injury and to motivate the individual to make a change in behavior, but the extreme symptoms of (major) depression seem to motivate the individual to disengage in activities all together. Both are forms of depression, how can one be adaptive and the other seemingly not?

Hagen proposes that depression is a form of bargaining or an adaptive strategy that informed others that one’s own interests were not being met and that he/she were more willing to absorb the costs of defection (cease providing benefits to the group be they economic or social) than continue to contribute to the group. In ancestral times, individuals existed in cooperative arrangements whereby one’s contribution to the group was very important and necessary. In these circumstances it was likely that because an individual’s contribution to a group was important to the success and livelihood of that group, defection (or ceasing to partake in activities that benefited the group as a whole) was socially constrained. An individual who suffers greater costs than the costs potentially incurred from defection might benefit by withholding what they provide (defect) until a new relationship is agreed upon. In other words “going on strike” or bargaining “allows participants to credibly signal their true valuation of the cooperative venture to their partners by demonstrating their willingness to suffer the costs of delay imposed by repeated rounds of bargaining-a greater willingness to delay credibly signaling a lower valuation of the venture” (Hagen 2002: 324). Once this bargaining takes place the costs and benefits of the venture can be fairly apportioned (Kennan & Wilson 1993). Hagen hypothesizes that the apparent pathological symptoms of depression may have been an adaptive mechanism that worked to reduce the benefits received from a depressed individual until this individual could receive more.

There are several predictions that follow in the bargaining model of depression, namely that social constraints should be associated with depression and that the onset of PPD symptoms in one partner should lead to the increased investment from the other. In order to test this hypothesis Hagen recruited 129 American families with children between the ages of 3 and 32 weeks from postpartum stress centers, local pediatric centers, and PPD websites. Hagen asked parents to rate the degree of social constraint perceived if the parents were to decide to have an abortion, their past and present sexual opportunities, their perceived relationship quality, change in investment before and after pregnancy, and if the pregnancy was (un)planned or
(un)wanted. From this framework he developed the following predictions:

1. Social constraints on abortion imposed by husbands should correlate strongly with PPD, but only for mothers facing unexpected costs from an unwanted or unplanned pregnancy.
2. Social constraints imposed by family and friends should correlate with maternal PPD but less strongly than those imposed by husbands because, in the US, these parties were expected to have less ability to constrain the mother and, in the case of friends, to have few fitness interests in the mother’s new infant.
3. Sexually successful men, but not women, are predicted to be at increased risk for PPD under socially imposed monogamy, even after controlling for relationship quality.
4. PPD in one spouse should be associated with increased parental investment in childcare by the other spouse.
5. Individuals with no other children and few future chances to invest in offspring (i.e., older mothers) have extremely low opportunity costs associated with investing in the new baby, even if social support and infant viability are low, and should be less inclined to reduce investment in a new offspring. They should therefore have lower levels of PPD (Hagen 2002).

Hagen identified couples who, based on either unwanted or unplanned pregnancies, formed a “costly pregnancy subgroup”. Contrary to his prediction the relationship between perceived constraint on abortion and PPD did not increase monotonically. Those mothers who identified the highest social constraint on abortion had a lower mean PPD score than all the other mothers. A rank correlation test, on the other hand, did confirm that for mothers who did not indicate the highest constraint there was a significant positive relationship between mother's PPD and the belief that an abortion would damage their relationship (social constraint). As predicted there was no correlation between PPD and those mothers who had planned or wanted pregnancies or with maternal sexual opportunity costs (indicated by the number of sexual partners available to them). Paternal depression scores, on the other hand, were significantly and positively correlated with sexual opportunity costs, indicating that men have more to lose by investing in a costly relationship. Hagen also found that “parents changes in childcare investment pre-pregnancy to postpartum were inversely correlated-if one parent reported increased investment, the other reported decreased investment, suggesting that a depression-induced decrease in investment might be correlated with increased
investment to the nondepressed spouse.” (Hagen 2002: 331) Finally Hagen found that women over 35 with only one child had PPD scores that were significantly less than women under 35 with one child indicating that they have lower opportunity costs in investing in their child.

Hagen (2002) concluded that defection from the cooperative group was definitely a selection pressure on the evolution of human psychology. Those individuals who suffered costs in the EEA but were socially constrained to defect might have benefited from bargaining or experiencing depression. As predicted, perceived social constraints were correlated with PPD for those mothers who had a higher opportunity cost. This correlation was not monotonically increasing, and Hagen suggests that the mothers who perceived the maximum constraint and experienced less PPD were unlikely to succeed in bargaining or becoming depressed.

It is evident that PPD must be universal if we are to understand it from an evolutionary perspective. If we find societies that give rise to the circumstances that Hagen outlines above (those that should predict the onset of PPD) and we do not find PPD, then an evolutionary model of PPD is suspect. Unfortunately, most of the debate concerning the occurrence of PPD has centered on the argument of whether PPD is a universal biological phenomenon or a cultural phenomenon that only appears in some groups and not others. This was first theorized by Stern and Kruckman (1983) who hypothesized that PPD would only be present in societies that did not have a culturally structured postpartum period for women. Specifically, they argued that the cultural components protect a woman from the onset of PPD are (1) cultural patterning of a distinct postpartum experience, (2) protective measures designed to reflect the vulnerability of the new mother, (3) social seclusion, (4) mandatory rest, (5) assistance in tasks from relatives and/or midwife, (6) social recognition of new social status through rituals, gifts or other means. Most cross-cultural studies pertaining to PPD have attempted to argue for or against a universality of PPD. The following three cross-cultural studies will address whether a culturally structured postpartum period is associated with the absence of PPD. Sara Harkness attempts to provide evidence that PPD is not universal in her study on Kipsigis women in Kenya. She suggests that culture can be a powerful mediator between physiological and emotional experience of women during childbirth.

The Kipsigis are a patrilineal society that, despite colonial contact, has maintained many of their traditional social practices. Division of labor is gender oriented, as men work with the cattle while the women cultivate crops. Social life is also sex-segregated, in the
afternoons men get together and drink beer while the women rest and drink tea. Kipsigis people are polygynous and desire to have large families. Harkness identifies several variables that she believes are cultural elements that protect women from the onset of PPD. For example, pregnancy is given no special attention and there are no special preparations made before the baby is born. The postpartum period is recognized by this community to be an especially vulnerable time for the mother who could now be the object of special attention as well as restrictions (Harkness 1987). The transition for the new mother back into daily life is marked by a culturally important tea party a few months after the baby is born. Harkness argues the above cultural factors and the structuring of the postpartum period prevent a woman from experiencing postpartum depression as the social support systems set in place cushions the women from a sad affect.

In order to test her hypothesis that Kipsigis women do not experience PPD as a result of the practices their culture employs Harkness interviewed ten pregnant women in the last half of their pregnancy, eight of whom she interviewed again at 2 to 3 weeks postpartum and six of whom were interviewed again at 2 to 3 months postpartum. She also interviewed a comparison group of ten women who did not have a baby under six months old. Harkness decided, based on the cultural constraints of open-ended interviewing and symptom checklists, to ask women to report on “a memory of something you did or something you saw a long time ago or more recently” and also to report a recent dream. She used this methodology “to use memories of both real events and dream experiences as projective measures of mood and thought content” (1987: 203).

Harkness coded the responses as either positive or negative; she also analyzed the memories and dreams for their thematic content and tabulated the results. She found that 30% of the memories reported in the prenatal period were wholly positive while 100% were positive in the first postpartum period, and 60% in the second postpartum period. Seventy-five percent of the comparison group responses were wholly positive. In coding the thematic content of the women’s dreams and memories, Harkness argues that the most striking feature concerning the thematic content was the presence of positive recollections by all the women immediately postpartum. She argues “the need for succor, expressed in the pregnant women’s interviews, was answered in the early postpartum period by the culturally structured forms of support provided to the women” (206).

Harkness argues that the data reviewed indicates differences in the way PPD is culturally recognized and that the presence or absence of certain social structures influences the etiology of the disorder in
women. She concludes that the western form of postpartum depression appears to be a culture-bound syndrome (1987).

This study supports an evolutionary explanation of PPD if we understand Kipsigis women as receiving enough social support preventing them from the experience PPD. PPD is culture-bound in the sense that, provided the culture meets certain criteria (high levels of social support, good environment etc.), women should be less likely to experience PPD. However, this does not refute the biological component of PPD, as the biology is only “activated” when in certain environments, nor does it refute an evolutionary explanation of PPD. In order to call into question the evolutionary theory of PPD, further research would need to provide evidence for depressed women in circumstances of higher social support, high paternal investment and healthy environments or the opposite, low social support, low paternal investment and poor environments and the absence of PPD.

Furthermore, it is questionable how dream and memory thematic analysis is an appropriate method for understanding levels of PPD. Granted, traditional assessments like surveys and questionnaires were developed in the modern, western world and might not be appropriate for assessing more traditional group’s levels of depression. To their credit, however, these measures are more straightforward by asking questions pertaining to the immediate future whereas dream and memory thematic analysis seem to be an arbitrary measure of one’s experience. In the above study on the Shuar, Hagen avoided the problem of differing cultural interpretations of depression by simply using the term ‘sadness’. This might have been a more appropriate way of assessing low mood among the Kipsigis.

Moon Park and Dimigen also sought to note cross-cultural differences in the occurrence of PPD by sampling a group of 52 Scottish mothers and 105 Korean mothers at 6-10 weeks postpartum. They, too, were interested in testing Stern and Kruckman’s (1983) hypothesis that the occurrence of PPD was a result of the specific cultural structuring of the postpartum period. They argue that PPD is more common in the west because we do not have as culturally structured period for the postpartum mother. According to Moon Park and Dimigen, Korean culture exhibits Stern and Kruckman’s six criteria. A new Korean mother requires 21 days of mandatory seclusion and rest during which she is attended to by family members and close friends who help her stay nourished and help her with daily activities (Moon Park & Dimigen 1995). On the other hand, Scottish women can be viewed as almost opposite of Korea. Scottish women return home 2-3 days postpartum and receive little help from anyone other than their husband, so often they are isolated from their social and
professional contacts (1995). According to Stern and Kruckman Scottish women, who culturally do not have a well-defined postpartum period buffering them from PPD, should be more depressed.

Moon Park and Dimigen used the Beck’s Depression Inventory (BDI) to access the depression levels of Scottish and Korean women. They found that the differences in the mean scores between the two groups of women differed significantly. Korean women scored higher (were more depressed) than Scottish women (M=11.22, M=6.72, respectively). They concluded that a comparison of Korean and Scottish mother’s depression levels is not supported by Stern and Kruckman’s hypothesis that Scottish mothers should suffer from depression more often. Although this study did not address the actual quality and quantity of social support among these mothers its findings are important because they inform us that the cultural structuring of the postpartum period does not necessarily imply more or less social support.

Marsella (1980) argues that depression cannot be seen as a universal disorder and that it varies considerably cross-culturally. Specifically he argues that depression is largely a Western disorder and is found much less often, if at all, in non-Western cultures. In order to test this hypothesis Shimizu and Kaplan (1987) sampled 29 women from Japan and 21 women from the United States who were 4-6 weeks postpartum in order to discern whether PPD was a universal phenomenon that was under-researched and recognized in Japan or if it was a “culture-bound” syndrome that appears in some cultures but not others.

Japan and the United States differ significantly in their lifestyles and family relationships (Masuda 1979; Ueko & Masuda 1981). Most notably is their differing view concerning what role a woman can attain within the culture. Japanese women do not value work or professional careers as much as women from the United States do. In fact, few women who are married actually do work. Japan can be characterized as an interdependent culture where dependence, the importance of the family, and a parenting style that fosters interdependence are culturally valued. The United States, on the other hand, can be characterized as an independent culture that values individual autonomy and personal goal fulfillment as well as a parenting style that stresses the development of a dependent child into an independent adult. Finally, relating to PPD, Japanese and American women differ in that the Japanese woman usually goes to her parents house for one month postpartum where she and the baby are cared for (Hatoya 1977; Honda 1974; Saito 1973). In many circumstances, the grandparents actually still live with the mother and her family creating
an environment conducive to a lot of social support. Shimizu and Kaplan (1987) found that there was no significant difference in depression between American and Japanese women. Despite the cultural structuring of the postpartum period, Japanese women experienced no less PPD.

Once again, although this study does not address the specific variables that should correlate to PPD under an evolutionary theory, it has important implications as it a) shows that PPD actually exists in other cultures and b) that a wholly cultural explanation of PPD is inaccurate and thus future studies need to address specific features of cultural structuring that are associated with the presence or absence of PPD. Evolutionary theory seems to be a step in the right direction.

The above three studies imply that there is little to no social structuring of the postpartum period for mothers in the West. This point, however, is not very convincing; in fact, the social practices surrounding birth in these societies seem quite similar to that of our own in the West. Granted, we do not isolate the women and baby for seven to twenty-one days, but I would argue that women achieve a new status when they are mothers and enjoy a lot of help from their mothers and family members. Also baby showers common in the west are quite similar to the tea party that occur the above society. Certainly there are cultural differences between Western and Eastern and tribal societies, but the above researchers might have exaggerated these differences to dispute Stern and Blackman’s as well as Marcella’s claims that PPD was largely cultural. Essentially they were stuck in viewing the world with the dichotomy of biology vs. culture. They reasoned, if societies are culturally different than the West in the way they structure pregnancy actually experience PPD, then we can say that PPD is biological. With an evolutionary explanation of PPD we are no longer stuck in this dichotomy, we now understand that culture, environment and biology (evolved psychology) all interact to signal to a mother, via PPD, that she is suffering a social cost. The broad generalizations that are utilized above are no longer useful. We need more specific questions that address what aspect of the social structuring of pregnancy is or is not causing PPD.

The next four studies more directly address the correlates that Hagen identified as predictors of PPD. In an attempt to understand cross-cultural findings of twin infanticide, Granzberg (1973) used the HRAF to test the hypothesis that the occurrence of twin infanticide can be explained from a materialistic perspective. In other words, Granzberg predicts that “twin infanticide is found in societies that provide insufficient facilities for a mother to properly rear two children
at once while at the same time fulfilling her other responsibilities” (Granzberg 1973: 406).

Granzberg tested 70 societies in the HRAF in which there was a clear rating for the presence or absence of twin infanticide. He argued that the presence or absence of facilities that provide a mother the wherewithal to successfully raise two children can be measured by

(1) the amount of help available to mothers as inferred from (a) settlement pattern size and (b) family size; and (2) the degree to which mothers are free from work as measured by (a) the extent to which she is free from subsistence production duties and (b) the extent to which she is free from time-consuming child care tasks such as breast feeding the child and carrying it around with her, even when it is asleep” (Granzberg 1973: 407).

He then coded these variables to assess the degree to which a woman had the appropriate facilities to successfully raise two children and whether these variables correlated with twin infanticide. Granzberg found that there was a significant correlation between inappropriate conditions to raise a child and twin infanticide (p<0.001). Thirty-three societies were coded as having appropriate facilities and only two of these practiced infanticide while in the 37 societies that did not have appropriate facilities 16 practiced infanticide.

These findings strongly support an evolutionary explanation of PPD. Although depression levels were not determined, the correlation between twin infanticide and inappropriate ecological, economic, and technological conditions to raise a child suggest that mothers are evaluating their fitness costs and benefits and behaving in a way that is predicted by an evolutionary explanation of PPD.

Felice et al. (2004) noted the prevalence rates and psychosocial variables associated with PPD among Maltese women. They conducted a random sample of 229 pregnant women utilizing sociodemographic history, a revised version of the clinical interview schedule and a translation of the Edinburgh postnatal depression scale at booking (M=18.6 weeks gestation), 36 weeks gestation, and 8 weeks postpartum to access correlations between psychosocial variables and prevalence of PPD. Several of their findings are pertinent to this discussion. Thirty-seven (15.5%) women met the ICD-10 criteria for being depressed at booking, 26 (11.1%) at 36 weeks gestation and 20 (8.7%) at eight weeks postpartum. However, they note that only nine cases (4.8%) were ‘true’ as the other 11 were also depressed at 36 weeks gestation. In other words, there were only nine cases of depression only postpartum.
They also found that at booking single status, adverse relationship with mother and father, negative reaction to pregnancy, partners and immediate family were all significantly associated with depression at the first assessment. Also, perceived poor marital relationship and lack of practical and emotional support from partners were significantly associated with depression. At eight weeks, PPD was more significantly associated \( (p<0.001) \) with relationship problems with in-laws, marital disharmony, poor emotional support, restriction of leisure and social activities, and dissatisfaction with social contact, and slightly less significantly \( (p<0.005) \) with family psychiatric history, personal psychiatric history and experienced difficulty with baby (Felice et al. 2004). They conclude that the low prevalence rates of PPD for women eight weeks postpartum (8.7% of cases and 3.9% of ‘true’ cases) among the Maltese might be explained by strong social support networks.

Felice et al.’s finding strongly support an evolutionary explanation of PPD. The correlations found between PPD and relationship problems with in-laws, marital disharmony, and poor emotional support are all variables that should be associated with PPD according to an evolutionary explanation. Moreover, the low prevalence rates overall suggest that the Maltese strong social networks work to buffer against PPD, again predicted by an evolutionary explanation. Also interesting, but not noted by the researchers, is the fact that 91% of the women sampled were married. Although this does not necessarily imply support, it might account for the overall low prevalence rates of PPD found among Maltese women since an evolutionary explanation of PPD suggests that paternal support is a predictor of PPD. The correlation found between PPD and family and personal psychiatric history is a future challenge to understanding PPD from an evolutionary perspective. It seems that a prior history of psychiatric problems implies that depression postpartum is not particular to pregnancy but rather a consequence of previous psychiatric problems. Future research will have to address this problem.

Stuchbery et al. expand on the concept of social support by examining its correlation to PPD among Vietnamese, Arabic, and Anglo-Celtic mothers in Australia. Specifically, they were interested in what kinds of social support correlated to PPD for each of these different cultural groups. Stuchbery et al. (1998) sampled 105 Anglo-Celtic, 113 Vietnamese and 98 Arabic women and asked them to assess seven social support variables (1) wanting more practical help from her partner or (2) from another person; (3) wanting more emotional support from her mother; (4) her partner or (5) form another person, (6) the
quality of the relationship with her partner or (7) her mother. They were also asked to access the quality of the relationship with the both their mother and partner. Stuchbery et al. also administered the Edinburgh Postnatal Depression Scale (EDPS) to these women six weeks postpartum to assess their levels of depression and how they correlated to the different aspects of social support.

Maternal perception of inadequate support

<table>
<thead>
<tr>
<th>Source and Type of Support Desired</th>
<th>Anglo-Celtic %</th>
<th>Vietnamese %</th>
<th>Arabic %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Support</td>
<td>27</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>Practical Help</td>
<td>35</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Support</td>
<td>12</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>Other Relatives/Friends</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Support</td>
<td>9</td>
<td>10</td>
<td>33</td>
</tr>
<tr>
<td>Practical Help</td>
<td>13</td>
<td>14</td>
<td>24</td>
</tr>
</tbody>
</table>

(Adapted from Stuchbery et al. 1998)

For an Anglo-Celtic mother, wanting more emotional support from her partner her mother were associated with higher rates of depression and accounted for 25% of the observed variance. For a Vietnamese mother, poor quality of relationship with her partner and wanting more practical support form her husband were associated with higher rates of depression and accounted for 34% of the observed variance. For an Arabic mother, only wanting more emotional support from her husband correlated with higher depression and accounted for only 5% of the observed variance.

Finally, the authors argue that the fact that Arabic women expressed just as much desire for help as Anglo-Celtic and Vietnamese women but interestingly these variables were not correlated with depression is the result of Arabic culture, which emphasizes community help and family network support and allows these women to not blame themselves. For Vietnamese and Anglo-Celtic women whose PPD correlated to wanting more support Stuchbery et al. suggest that the cultural values of individual strength and coping produced more of a sense of failure and blame and thus PPD. Finally, they conclude that culture produces expectations of support and that “these expectations might contribute to a woman’s expectations of self-
reliance and her subsequent feelings of failure” (Stuchbery et al. 1998: 489).

These findings are interesting for an evolutionary explanation of PPD. They seem to suggest that it is not the quality or quantity of social support that is a predictor of PPD but rather the mother’s expectations of that support, which is determined by cultural values. An evolutionary explanation of PPD would predict that mothers who perceive lower levels of social support should experience more PPD, but this was not so as evidenced by Arabic women who expressed as much desire for help but had the lowest depression scores. However, if Arabic mothers actually did receive more support, which is supported by Arabic culture that values community help and the family network, then these findings are not surprising. The distinction that needs to be made is whether perception of lack of support is equal to support actually received? If these are not equal, and higher expectations by Arabic women cause them to perceive low levels of support, then once again we would not expect these to correlate to PPD. In other words, higher expectation of support is purely cultural and should not be correlated with PPD. Only actual levels of social support, high or low, will be associated with the presence or absence of PPD. Nevertheless the data do suggest that the relationship between support of mother and partner and PPD reaffirms the importance of these variables acting on PPD.

Edge et al. recruited 101 black Caribbean and 200 white British women from Manchester, England to assess correlations between psychosocial risk for depression (major life events and ongoing difficulties, partner and social support and previous history of mental illness) and PPD (using the Edinburgh Postnatal Depression Scale) during the third trimester and six weeks postpartum.

They found that black Caribbeans were significantly more likely to experience social risks for depression than white British (Edge et al. 2004). For example, 46% of black Caribbeans lived in the most deprived area of the city as compared to 30% of white British, received less social support as 49% were single compared to 27% of white British and even when in relationships they confided less with their husbands 39% as compared to 51% of white British. Despite these findings, black Caribbean women were significantly less likely to be depressed in the third trimester 26% as compared to 38%. The six week postpartum findings on social risk for depression were similar to those found during the third trimester: black Caribbeans were more likely than white British to live in the most deprived areas, be single and have less postnatal support. Interestingly, despite more social risk, black Caribbeans (n=19, 27%) were no more likely to score above the
threshold for depression (EPDS>12) than white British (n=27, 21%) postnatally. The researchers argue that their qualitative analysis of black Caribbean narratives suggests that many of the black Caribbean women perceive themselves as ‘strong, black women’. They argue that because these women have experienced more hardship historically (e.g. slavery) they developed a higher threshold for dealing with adversity in order to survive and thus this acts as a buffer between psychosocial risk and PPD.

Once again these are curios findings if we want to understand PPD from an evolutionary perspective. An evolutionary theory of PPD would predict that women, who live in a harsher environment, or an environment less conducive to rearing a child successfully, would experience higher rates of PPD. Not only did black Caribbean women in the above study live in an environment marginal but they were more often single as well indicating that they had less social support. It is therefore curios that these women were found to be no more depressed than white British women. In fairness to Hagen, it is hard to compare modern industrial situations to that of the EEA. Social risk in the EEA was probably a lot more of a risk than social risk in the modern industrial world. It seems hard to compare the slums of Manchester to the harsh environments of the EEA where a woman might not have enough resources to feed herself let alone a new child. In the modern context the most deprived areas might not be that different than semi-deprived areas or non-deprived areas in terms of survival.

Viewed from this perspective we might not expect to see any difference in PPD rates between black Caribbeans and white British women. Also not mentioned in this study is the social support network of black Caribbean women. Traditionally Caribbean women live matrifocally, and although this cultural tradition may not still exist for black Caribbean women who have immigrated to Britain it still would be an important factor to explore. Even though black Caribbean women were more likely to be single it might not matter in terms of social support if they received the extra support from their mothers and sisters, which is inherent to a matrifocal residence pattern or even a family situation that is centered on female lineage. Once again the low prevalence rates of PPD found among black Caribbean women might be explained higher levels of social support that are almost guaranteed in a matrifocal situation.

It is apparent from the above research that PPD is found in many different cultures around the world. It also indicates that a culturally structured postpartum period does not predict the absence of PPD. We can no longer view PPD as either a culture-bound syndrome or a biological phenomenon that acts independently of culture. An
evolutionary explanation of PPD expands the debate to include specific
criteria from which we would expect to find PPD. The strong
correlations between social support, low infant viability, and poor
environments, and PPD found in almost all studies indicate that an
evolutionary theory is more comprehensive in accounting for variation
in the prevalence of PPD. This is the value of an evolutionary
explanation of PPD. It fosters further research and demands that
models become more focused and directed as it attempts to account for
some of the intricacies of human behavior. It is clear that more
research on cultures that exhibit the features of the EEA is needed to
develop a more accurate understanding of the occurrence of PPD.
Despite this, an evolutionary explanation of PPD more fully
accommodates cross-cultural differences that are found around the
world.

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