

# STRESS, ADVERSE PREGNANCY OUTCOMES, AND AFRICAN-AMERICAN FEMALES

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## INTRODUCTION

African Americans continue to trail their white counterparts in having disproportionately higher rates of maternal mortality<sup>1</sup> and infant mortality.<sup>2</sup> While the reasons for these outcomes are as complex as they are varied, this paper will present information on the role stress plays in selected adverse pregnancy outcomes, or APO (e.g., very low birthweight (LBW), preterm births, pregnancy-related morbidity and mortality), in the U.S. population in general and in the African-American population in particular. While a reciprocal relationship may exist between stress and APOs, the information presented in this article relates more to the direct or indirect relationship between stress and APOs, and not the other way around. In order to facilitate a discussion around this complex stress–APO relationship, a sociopsychophysiological model (SPPM) of the stress process is used as a conceptual guide.

Although social risk factors are increasingly being studied, they must include environmental stressors, which shape individual vulnerability and resistance to risk factors for health.<sup>3</sup> Various epidemiological studies<sup>4,5</sup> have examined whether the racial/ethnic disparities in APOs (preterm and LBW) can be explained by maternal age, education, lifestyle, and socioeconomic status. However, these factors only account for a small amount of

explained variation in the racial/ethnic disparities related to APOs. It is very interesting to note that even college-educated black mothers are more likely to deliver very-low-birthweight (VLBW) infants than college-educated white mothers. It has even been suggested that the relative gap (along racial lines) widens as socioeconomic position increases.<sup>6</sup>

It is argued in this article that as a salient factor, stress is, in part, derived from the perceptual experiences of African-American women, and these experiences, in turn, contribute to the increasing racial/ethnic gaps in APOs. It is also argued that because the stress–APO relationship is dynamic (as is illustrated in the SPPM presented later in this article), it can act either as an independent variable and/or it can interact with other variables (e.g., socioeconomic status) to impact APOs.

## Adverse Pregnancy Outcomes and African-American Women

There is growing evidence that women who experience high levels of social and psychological stress during pregnancy are at a significantly increased risk for conditions related to APOs, such as shorter gestation, earlier onset of spontaneous labor, and preterm delivery. These risks still exist even after adjustments are made for the effects of other established biomedical, sociodemographic, and behavioral risk factors.<sup>7</sup>

The fact that black mothers in the United States are twice as likely to experience a wide variety of APOs is well documented.<sup>2,8</sup> Low birthweight, a primary determinant of infant mortality, is twice more prevalent for African Americans than whites. Infants born weighing less than 1,500 grams, or VLBW, due to early delivery with or without slow fetal growth, are at significantly increased risk of mortality and morbidity.<sup>2</sup> In the United States, among black mothers, the VLBW rate is three

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times higher than that among white mothers.<sup>2</sup>

Preterm labor is a clinical syndrome characterized by uterine contractility, cervical ripening, and/or membrane rupture occurring before 37 weeks of gestation.<sup>9</sup> Infection has emerged over the years as an important and frequent mechanism of disease in premature labor. Infection is the only pathologic process for which an established causal link with prematurity has been established and for which a defined molecular pathophysiology is known.<sup>10</sup> Empiric use of antibiotics to prevent prematurity has resulted in serious infections in the mother and infant with resistant organisms<sup>11</sup> and in a significant increase in neonatal necrotizing enterocolitis.<sup>12</sup> The current clinical approach relies mainly on the use of drugs, including B-adrenergic agents, magnesium sulfate, prostaglandin synthase inhibitors, and calcium channel blockers,<sup>13</sup> to arrest premature contractions.

### **Stress, African Americans and APOs: A Conceptual Model**

Although there is no universally accepted definition of stress, a dominant view is that it clearly involves a “person–environment” interaction (or transaction).<sup>14</sup> While stress is an internal reaction that involves various physiologic processes, for purposes of this paper the main concerns are with the sociopsychological factors, or stressors, that initiate the stress process and the need to maintain balance, or homeostasis/allostasis, to relieve the stress.<sup>15</sup>

Given the multidisciplinary and multidimensional aspects of the SPPM (which is evidenced in its label), it is not surprising that various theories from different disciplines are applicable to the SPPM. For example, from sociology and organizational psychology, Systems Theory posits a hierarchical ordering of social, psychological, and biological levels, or systems, each of which has its own resources, needs, and limitations. Also, these systems are inter-related in such a manner that a change at one level invariably impacts behavior at other levels. Consistent with a systems perspective, the SPPM suggests that an individual’s experience of stress may be the result of, as well as a contributor to, the stressors and changes within society as a whole.

### **Explaining the Stress–APO Relationship Using the SPPM**

While support has been reported for the role stress plays in pregnancy outcomes, few of these

studies<sup>16,17</sup> have incorporated a conceptual stress model. It is with this void in mind that this paper uses a sociopsychophysiological model, or SPPM (see Livingston<sup>18</sup>), with the intent of improving understanding of the stress–APO relationship, especially as it relates to the experiences of at-risk African-American women (see Figure 1).

One possible way to collectively assess the multidimensional nature of the stress–APO relationship and at the same time incorporate the interactive effects between macrophenomena and microphe-nomena<sup>19</sup>—both of which seem important in explaining differential physiologic reactivity to stress for African-American women<sup>20</sup>—is to have a guiding conceptual model, such as the SPPM. The SPPM explains the possible ways in which the stress–APO relationship occurs through an array of multidimensional and interactive concepts. Additionally, it presents areas to intervene to reduce the stress–APO relationship for African-American women.

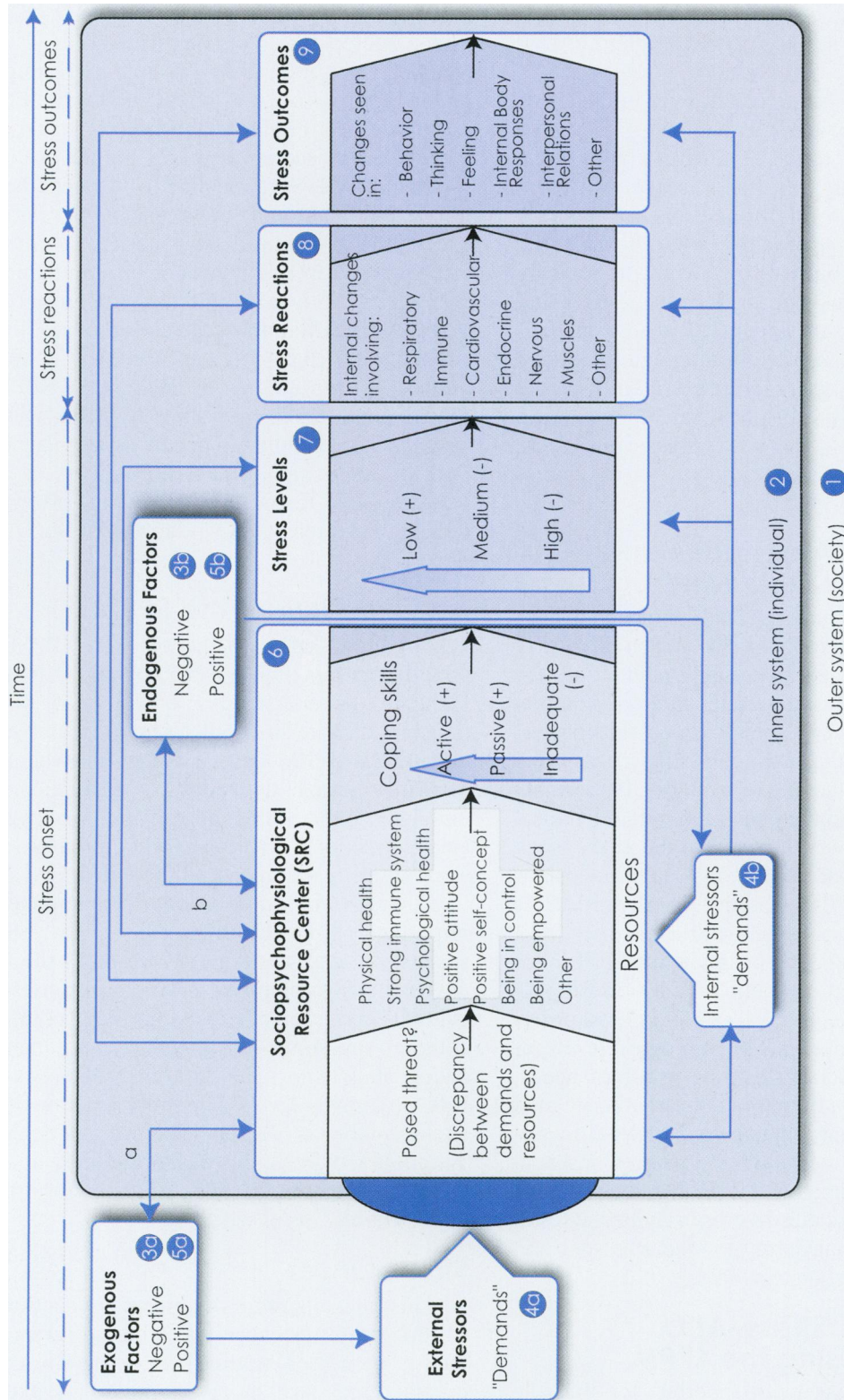
### **An Overview of the SPPM**

Although a brief explanation of the SPPM will be provided in this paper in the context of how it can facilitate the understanding of the stress–APO relationship, a more in-depth description and explanation of the SPPM can be found elsewhere.<sup>18,21</sup> As seen in Figure 1, the following features should be noted about the SPPM: a) it is an interactive model (see bidirectional arrows); b) it has three basic stages (i.e., onset, reactions, and outcomes); and c) these three stages comprise nine basic components. Of importance to the SPPM is the fact that the wider society, or outer system (1), subsumes the individual, or inner system (e.g., African Americans) (2). With the exception of exogenous factors (3a, 5a) and external stressors (4a), all other components (i.e., endogenous factors (3b, 5b), internal stressors (4b), SRC (6), stress levels (7), stress reactions (8), and stress outcomes (9) are subsumed under the inner system (2), or basically within the individual. Also, there is an ongoing interaction over time between both systems.

### **Stress Onset**

This phase is the most important section of the SPPM, simply because it is where a series of subjective processes begin. This being the case, six crucial areas are involved including exogenous (outside) (3a, 5a) and endogenous (inside) (3b, 5b)

**Figure 1. A Sociopsychophysiological Model of the Stress Process**



This model is a further modified version that last appeared in the following publication: Livingston, IL. *Social Status, Stress and Health: Black Americans at Risk* (pp. 236-252). In IL Livingston (Editor), *Handbook of Black American Health*, Westport, CT: Greenwood Press, 1994.

a External conditions in society contributing to the functioning of the SRC.

b Internal factors within the individual contributing to the functioning of the SRC.

↔ Bidirectional arrows reflect the reciprocal nature of designated elements of the model.

factors; external (4a) and internal (4b) stressors; the Sociopsychophysiological Resource Center (SRC) (6) and stress levels (7). Again, as the arrows indicate, the SPPM is a multicausal, bidirectional and interactive model, where the basic and fundamental assumption is that the wider society (1—in this case the American society) encompasses and, therefore, is likely to have an impact on the individual (2—which, in this case, refers to the African-American female) in a dynamic and interactive manner. For African-American females (2), this latter point is very important, given the dominant and institutionally racist nature (Livingston<sup>22</sup>) of the wider U.S. society (1). It is reasoned in this paper that a contributing factor to the stress–APO relationship for African-American females is their perception of and negative experiences with the daily realities of both positive (5a; e.g., social support) and negative exogenous factors (3a; e.g., racism and poverty).

Whatever the precursor and actual sources of stress, it is important to note that exogenous factors (3a, 5a) and endogenous factors (3b, 5b) all *interact* and *combine* in contributing to the effectiveness of African-American women's SRCs (6). As seen in Figure 1, the SRC is at the “core” of the SPPM and is defined as “*The mind body enduring capacity that individuals have that filters, mediates, neutralizes, and subsequently serves to stabilize all entering noxious and other stimuli or stressors.*”<sup>18</sup>

### Exogenous Factors, External Stressors, and the SRC

As is illustrated in the model, if African-American women are predisposed to experience a host of negative (i.e., adverse), exogenous factors (3a; e.g., like poverty, racism, undesirable life events), these factors could contribute to related stressors or demands (4a), wherein the absence of more positive (i.e., moderating) exogenous factors (5a) could lead to perceived threat in their SRCs (6). It is important to note that given the dynamic nature of the SPPM, an initially predisposing negative, exogenous condition (3a; e.g., racism, low socioeconomic status—Williams<sup>23</sup>) may itself be perceived as a stressor (4a; e.g., discrimination, as seen in denial of certain needs involving housing, hospitalization, and work). For example, it was said, “A woman's perception that she resides in a ‘bad’ (“posed threat”) neighborhood may be a chronic stressor that disproportionately affects the

reproductive outcome of African Americans.”<sup>24</sup> Women's perception of negative exogenous factors (3a) as stressors (4a) is at the core of the transactional definition of stress used in this paper. Therefore, what makes women perceive negative exogenous factors (3a; e.g., racism) as external stressors (4a; e.g., discriminatory practices) is related to their “collective” experiences (i.e., associated with their SRCs), hence the seemingly uniform perceptions, stress reactions, and, ultimately, stress outcomes (e.g., APOs).

### Endogenous Factors, Internal Stressors, and the SRC

Although these negative (i.e., adverse) and positive (i.e., moderating) factors are basically internal, because of African-American women's skills, personalities, dispositions, and/or developmental experiences based on the dynamic interplay of the important segments of the SPPM as seen in Figure 1, they are likely to influence or are affected by exogenous factors (3a, 5a) and external stressors (4a). It is also evident by examining the SPPM that the endogenous factors are related to a possible variety of internal stressors (4b). However, because of their relative importance and greater visibility, external stressors (4a) are emphasized versus internal stressors (4b) in this paper.

It has been stated in the past,<sup>22</sup> that from an early developmental level, various stresses (7) in blacks begin their insidious influence even in utero (i.e., negative endogenous condition—3b) in mothers who must cope with the vicissitudes of poverty (3a) and related potential stressors, both external (4a; e.g., literally surviving on a daily basis in a crime-infested housing project, inadequate prenatal care, all of which are negative exogenous factors (3a) that can, depending on the individual (2) make-up of women, lead to related external stressors, 4a)). In a related manner, a host of possible negative endogenous factors (3b; e.g., poor/inadequate nutrition, inadequate sleep, poor health) can lead to internal stressors (4b) as well. As seen from the SPPM in Figure 1, it is evident that such stressors and subsequent stress have the very real potential of negatively contributing to the strength of African-American women's SRCs and, eventually, to their APO experiences (9) alluded to so far in the paper.

Factors that are potential buffers, or moderators, in the stress–APO relationship are positive endoge-

nous factors (5b), such as having strong personality characteristics (e.g., a hardy personality).<sup>25</sup> These factors are also likely to reduce the effects of stressors, both external (4a) and, to a lesser extent, internal stressors (4b) by moderating their effects. Again, because of the dynamic nature of the SPPM, as seen in Figure 1, the moderating effect may be either in an indirect manner, where these endogenous positive factors (5b) can increase the personal resiliency of women's SRCs, thereby reducing the perceived threat of external stressors (4a). Alternatively, they can act directly through a pathway to internal stressors, thereby reducing the latter's potential negative effect. Contributing factors to personal resiliency include self-esteem, optimism, and mastery beliefs of being in control of life's activities.<sup>26</sup>

Other more physiologic factors can exist that serve as possible examples of negative endogenous factors. A very important factor in elucidating the behavioral and/or biological influences mediating the effects of prenatal stress on gestational outcomes is the role of the corticotropin-releasing hormone, or CRH. Basically, the CRH, as a hypothalamic neuropeptide, plays a central role in regulating the activity of the HPA axis and in the physiological response to stress.<sup>27</sup> Recent reports suggest that the effects of psychosocial stressors (4a) may be mediated by cortisol-induced positive feedback increases in placenta secretion of CRH.<sup>28</sup> Additionally, overwhelming evidence indicates that women in preterm labor have significantly elevated levels of CRH compared with gestational age-matched control women, and that these elevations of CRH precede the onset of preterm labor in some cases by several weeks.<sup>7</sup>

## Stress Reactions

This second phase (8) may be experienced, depending on the functional state of African-American women's SRCs (6), which, in turn, contributes to their stress levels (7).

Physiologic responses to (psychosocial) stress have been well documented.<sup>20</sup> For purposes of this paper, physiologic responses are the very important pathways linking stress and APOs. While these responses are varied and complex at times, they include, among others, hormonal changes (e.g., progesterone, estrogen, and oxytocin), calcium ions, adrenergic agents and receptors, catecholamines, and blood flow from the uterus to the placenta.<sup>20</sup> All of these internal changes, at least for

acute stress, are protective, functional, and adaptive for the body.

According to McEwen,<sup>15</sup> internal body changes are captured in the concepts of allostasis and allostatic load. The concept of "allostasis" (active responding of biological mediators that maintain homeostasis) leads to the concept of "allostatic load" (the wear and tear of the body due to overuse of allostasis by repeated stress regulation of the mediators—failure to shut them off when no longer needed).

Infection is known to be a risk factor for preterm birth.<sup>29</sup> A rather common infection in women of child-bearing age is bacterial vaginosis (BV). The disorder is a synergistic effect of multiple genital infections. These bacteria reduce the viability of *Lactobacillus* species—the bacteria that protect against urinary tract infections and a host of other chronic ailments.<sup>30</sup> BV is associated with a two-fold increase in the risk for preterm labor and premature rupture of membranes.<sup>31</sup> The rate of BV prevalence is at its highest during early gestation, at which time the presence of BV is associated with greater pathophysiologic consequences, such as preterm birth, than BV detected in the later second or third trimesters.<sup>32</sup> African Americans have substantially more bacterial vaginosis, histologic and clinical chorioamnionitis, and postpartum endometritis, and it has been proposed that infection may explain a considerable portion of the black/white difference in preterm birth.<sup>33</sup>

## Stress Outcomes

Although the focus of this paper has been on the stress–APO relationship, there are various other factors (e.g., prenatal care, nutritional factors) that have to be taken into account, along with stress, in any comprehensive attempt to improve our understanding of APOs, especially among at-risk African-American women. However, it has been said<sup>20</sup> that the importance of stress is increasingly being recognized, because a number of empirical studies have indicated that pregnant women from different racial, ethnic, and sociodemographic backgrounds who experience high levels of stress during pregnancy are at a significant risk for APOs (e.g., shorter gestation, earlier onset of spontaneous labor, preterm delivery)—even after controlling for a variety of known extraneous risk (e.g., biomedical, sociodemographic, and behavioral—Paarlberg et al.,<sup>34</sup> Wadhwa<sup>7</sup>) factors.

## Reducing Stress by Intervening to Increase Positive Exogenous and Endogenous Factors

As an example of a positive, exogenous, moderating factor, social support<sup>35</sup> is usually the most frequently cited in the literature. In the case of African-American women, care should be taken to include the number of persons in their social network who can be relied upon for the five main functions of support: instrumental, emotional, informative, normative, and companionship.<sup>26</sup> As discussed before, these experiences are valuable in buffering of moderating the stressful experiences that women may perceive. But perhaps more importantly of all, whatever efforts are used, the overall emphasis of these efforts should be directed to increasing the resiliency of the women's SRCs.

Examples of positive, endogenous factors can include psychosocial conditions and behavioral factors. It has been said that self-efficacy seems to be at the core of a variety of class distinctive modes of thought.<sup>36</sup> It was reported that higher-class (versus lower-class) individuals had a greater sense of possibilities and that this provided an empowering perception (or feelings of greater self-efficacy).<sup>36</sup> Stansfeld and Marmot<sup>37</sup> found that lower-class status was associated with greater depression and lower sense of well-being, together with greater salience of negative events—all of which had a negative impact on self-efficacy.

## Conclusion

The discussion of the disproportionate incidence of APOs (e.g., very low birthweight and premature births) among African-American women—especially those who are at-risk because of poverty and other related living conditions—underscores the seriousness, urgency, and need for immediate change. The ultimate success of any intervention is, in part, dependent upon what intervention strategies and what model are used to guide these strategies, such as the SPPM presented in the paper.

Given that the emphasis in the paper was placed on the stress–APO relationship, where stress is viewed as an important contributing factor (along with the traditionally accepted conditions of low birthweight and prematurity), it should play a very important role in future efforts to reduce APOs in the African-American population. Health education intervention can be used as the means to implement

the intervention strategies directed at reducing and controlling stress in targeted, at-risk African-American women, especially those who are pregnant and socioeconomically deprived. Based on the discussion that involved the SPPM presented in Figure 1, the ultimate focus of health education strategies delivered through, for example, case managers should, of necessity, be directed to improving the strength and resiliency of African-American women's SRCs.

## REFERENCES

1. Koonin LM, Mackay AP, Berg CJ, Atrash HK, Smith, JC. Pregnancy-related mortality surveillance, United States, 1987-1990. In: CDC Surveillance Summaries (August, 1997), *MMWR*. 1997;46(SS 4):17-36.
2. National Center for Health Statistics. Births: Final Data for 1999. *National Vital Statistics Report*. 2001;49, Hyattsville, MD.
3. Sampson R. Linking the micro- and macrolevel dimensions of community social organization. *Social Forces*. 1991;70:43-64.
4. Rowley D, Hogue CJR, Blackmore CA, Ferre C, Hatfield-Timajchy K, Branch P, et al. Preterm delivery among African-American women: A research strategy. *American Journal of Preventive Medicine*. 1993;9(6 Suppl.):1-6.
5. Sheehan TJ, Gregorio DI. Low birthweight in relation to the interval between pregnancies. *New England Journal of Medicine*. 1995;333:386-387.
6. Kleinman JC, Kessel SS. Racial differences in low birthweight. Trends and risk factors. *New England Journal of medicine*. 1987; 317:749-753.
7. Wadhwa PD. Prenatal stress and life-span development. In: *Encyclopedia of Mental Health*. Editor: Friedman H. San Diego: Academic Press, 1998;265-280.
8. Berg CJ, Wilcox, LS, D'Almado, PJ. The prevalence of socioeconomic and behavioral characteristics and their impact on very low birthweight in black and white infants in Georgia. *Maternal and Child Health Journal*. 2001;45:75-84.
9. Romero E, Avilia C, Santhanam U, Sehgal PB. Amniotic fluid interleukin-6 in preterm labor: association with infection. *Abstract. J Clin Invest*. 1990;85:1392-1400.
10. McDonald HM, Loughlin JA, Vigneswaran R, et al. Impact of metronidazole therapy on preterm birth in women with bacterial vaginosis flora (*Gardnerella vaginalis*): A randomized, placebo-controlled trial. *Br J Obstet Gynecol*. 1997;104:1391-1397.
11. McDuffie Jr RS, McGregor JA, Gibbs RS. Adverse perinatal outcome and resistant enterobacteriaceae after antibiotic usage for premature rupture of the membranes and group-B streptococcus carriage. *Obstet Gynecol*. 1993;82:487-489.
12. Owen J, Groome LJ, Hauth JC. Randomized trial of prophylactic antibiotic therapy after preterm amnion rupture. *Am J Obstet Gynecol*. 1993;169:976-981.
13. Gibbs RS. The relationship between infections and adverse pregnancy outcomes: An overview. *Ann Periodontol*. 2001;6:153-163.
14. Lazarus RS, Cohen JB, Folkman S, Kanner A, Schaefer C. Psychological stress and adaptation: Some unresolved issues. In H Selye (ed.), *Selye's guide to stress research*, Volume 1 (90-117), 1980. New York: Van Nostrand Reinhold Company.

15. McEwen BS. *The End of Stress as We Know It*. The National Academies Press, 2002.
16. Hogue CJ, Hoffman S, Hatch MC. Stress and preterm delivery: A conceptual framework. *Paediatric and Perinatal Epidemiology*. 2001;15(Suppl. 2):30-40.
17. Rutter DR, Quine L. Inequalities in pregnancy outcomes: A review of psychosocial and behavioral mediators. *Social Science in Medicine*. 1990;38:553-568.
18. Livingston IL. Social status, stress, and health: black Americans at risk. In LI Livingston (Ed.), *Handbook of Black American Health: The Mosaic of Conditions, Issues, and Prospects*, (Chapter 16), 1994. Westport, CT: Greenwood Publishing Group, Inc.
19. Jackson FM, Phillips MT, Hogue CR, Curry-Owens TY. Examining the burdens of gendered racism: Implications for pregnancy outcomes among college-educated African-American women. *Maternal and Child Health Journal*. 2001;5:95-107.
20. Wadhwa PD, Culhane JF, Rauh V, Barve SS. Stress and preterm birth: Neuroendocrine, immune/inflammatory, and vascular mechanisms. *Maternal and Child Health Journal*. 2001;5:119-125.
21. Livingston IL. Guidelines for stress management. *Directions in Clinical & Counseling Psychology*. 1996;6(Special Report):SR3-SR10.
22. Livingston I. (1986/7). Blacks, lifestyle, and hypertension: The importance of health education. *The Humboldt Journal of Social Relations*. 14,1&2:195-213.
23. Williams, DR. Race, socioeconomic status, and health: The added effects of racism and discrimination. *Ann NY Acad Sci*. 1999;173-188.
24. Collins Jr JW, David RJ, Symons R, Handler A, Wall S. African-American mothers' perception of their residential environment, stressful life events, and very low birthweight. *Epidemiology*. 1998;286-289.
25. Major B, Richards C, Cooper ML, Cozzarelli C, Zubek J. Personal resilience, cognitive appraisals, and coping: An integrative model of adjustment to abortion. *Journal of Personality and Social Psychology*. 1998;74:735-752.
26. Kramer MS, Goulet L, Lydon J, Seguin L, McNamara H, Dassa C, Platt W. Socioeconomic disparities in preterm birth: causal pathways and mechanisms. *Paediatric and Prenatal Epidemiology*. 2001;15(Suppl. 2):104-123.
27. Chrousos GP. Regulation and deregulation of the hypothalamic-pituitary-adrenal axis. The corticotrophin-releasing hormone perspective. *Endocrinol Metab Clin North Am*. 1992;2:833-858.
28. Lockwood, CJ. Stress-associated preterm delivery: The role of corticotropin-releasing hormone. *American Journal of Obstetrics and Gynecology*. 1999;180:S264-S266.
29. Ville Y. Inflammation and premature delivery. *Journal de Gynecologie, Obstetrique, et Biologie de la Reproduction*. 2001;30(Suppl. 1):12-16.
30. Myslobodsky M. Preterm delivery: On proxies and proximal factors. *Paediatric and Perinatal Epidemiology*. 2001;15:381-383.
31. Hillier SL, Nugent RP, Eschenbach DA, Krohn MA, Gibbs RS, Martin DH, et al. Association between bacterial vaginosis and preterm delivery of a low birthweight infant. *New England Journal of Medicine*. 1995;333:1737-1742.
32. Culhane JF, Rauh V, McCollum KF, Hogan VK, Agnew K, Wadhwa PD. Maternal stress is associated with bacterial vaginosis in human pregnancy. *Maternal and Child Health Journal*. 2001;5:127-134.
33. Fiscella K. Racial disparities in preterm births: The role of urogenital infections. *Public Health Reports*. 1996;111:104-113.
34. Paarlberg KM, Vingerhoets JJM, Passchier J, Dekker GA, Van Geijn HP. Psychosocial factors and pregnancy outcome: A review with emphasis on methodological issues. *Journal of Psychosomatic Research*. 1995;39:563-595.
35. Hoffman S, Hatch MC. Stress, social support, and pregnancy outcome: A reassessment based on recent research. *Paediatric and Perinatal Epidemiology*. 1996;10:380-405.
36. Henry P. An examination of the pathways through which social class impacts health outcomes. *Academy of Marketing Science Review* (online) 2001 01 (03). Available: [http:// www.amsreview.org/amsrev/theory/henry03-01.html](http://www.amsreview.org/amsrev/theory/henry03-01.html)
37. Stansfeld SA, Marmot MG. Explaining social class differences in depression and well-being. *Social Psychiatric Epidemiology*. 1998;33:1-9.

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