

# Age-Based Reproductive Healthcare Stereotype Threat (HCST) as a Stressor Affecting Prenatal Mental Health in Pregnant Women of Advanced Maternal Age: Measurement, Process, Outcomes, and Interactions with Ethnicity/Race, SES, and Other Social Identities

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## Abstract

**Purpose of Review** Reproductive health, and pregnancy more specifically, is the first critical link between generations. Beginning with this first critical link, pregnancy acts as a domino, affecting the expression of genes and determining the lifespan mental and physical health and reproductive potential of offspring and, likely, of subsequent generations. Given the powerful intergenerational domino that is pregnancy, the development of innovative models to enhance reproductive health and outcomes is an invaluable public health investment. **Recent Findings** While US pregnancy and birth outcomes have improved dramatically since the 1960s—including substantial progress within the past 15 years, largely catalyzed by the *Healthy People* initiative—group-based disparities remain. What is more, social change and medical advancements have led to an evolving window of female reproductive age. Despite becoming more common, being an older expectant mother remains a stigmatized social identity. The concept of healthcare stereotype threat (HCST) is introduced in relation to reproductive health. Stereotype threat is a situational predicament in which an individual who possesses a stigmatized social identity fears being judged by and/or confirming negative group-based stereotypes. HCST is a healthcare-specific form of stereotype threat, arising out of stereotypes that are salient in healthcare settings and in relation to health services more broadly. It is

hypothesized that the experience of age-based reproductive HCST is an overlooked stressor affecting prenatal mental and physical health among women of advanced maternal age.

**Summary** The hypothesized process of age-based reproductive HCST and its measurement are described; outcomes and consequences are discussed; interactions with ethnicity/race, SES, and other aspects of social identity are considered; and strategies for prevention and intervention are explored, including active and passive shifts in three areas: (1) internally, in both providers and patients; (2) in the institutional context or culture or the external/physical environment; and (3) within interpersonal interactions that occur in healthcare settings, particularly between physicians and patients. Implications for gynecological, infertility, and obstetric care and improving the reproductive outcomes of older women are discussed.

**Keywords** Reproductive health · Infertility · Pregnancy · Advanced maternal age · Birth outcomes · Stress · Mental health · Healthcare stereotype threat · Stereotype threat · Health care · Health disparities

## Introduction

Women's reproductive health is not just a women's health issue. It is not even merely a health issue. It is better classified as a societal issue given its far-reaching and lasting imprint on our society [1•, 2•, 3, 4]. As such, the development of innovative models that better explain variability in reproductive outcomes is an invaluable public health investment. In 1997, Shiono and colleagues [5] found that 46 well-known sociodemographic and biomedical risk factors accounted for only 10% of the variance in birth outcomes among African American,

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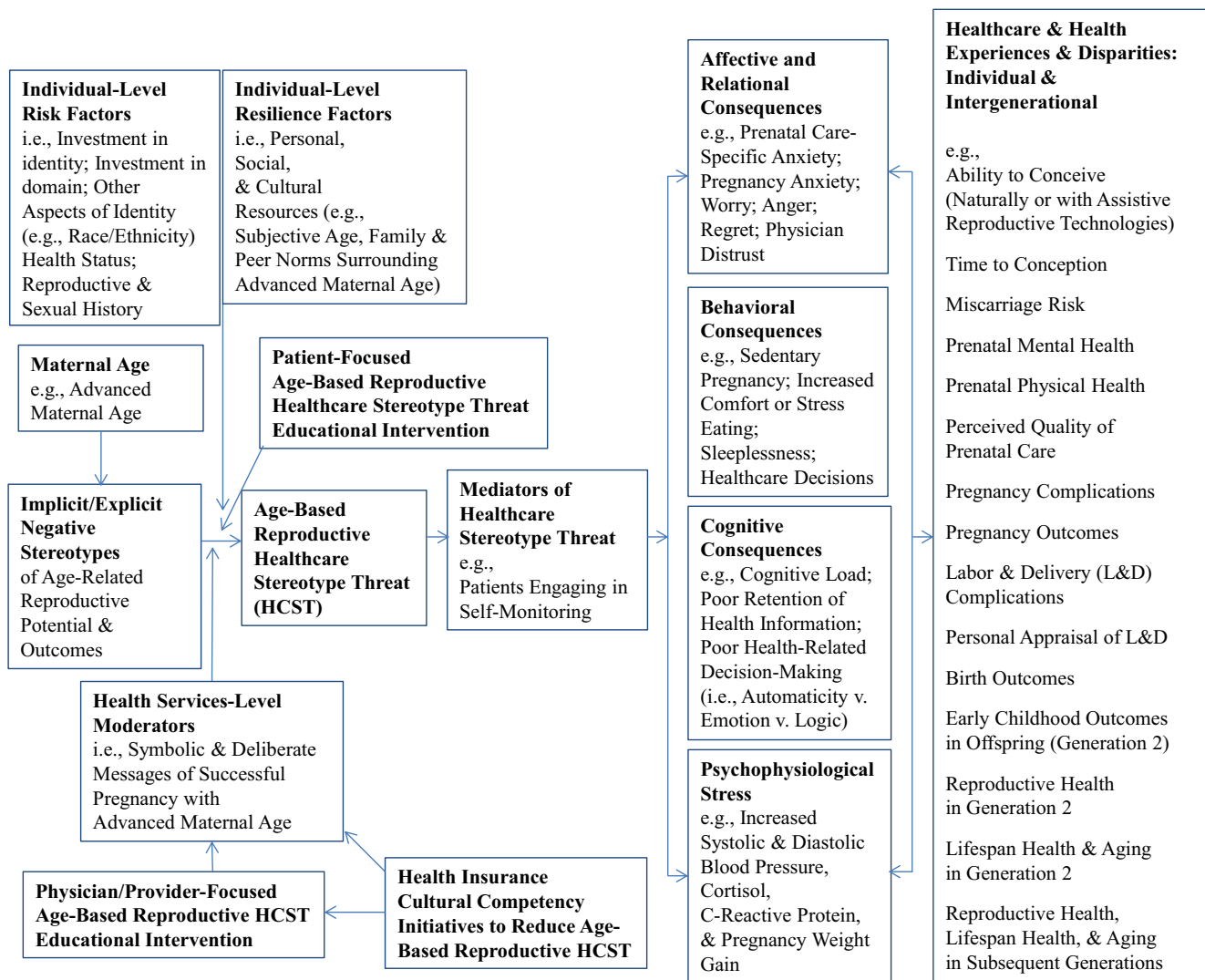
Chinese, Dominican, Mexican, Puerto Rican, and White women. Two decades later, reproductive outcomes and disparities remain a public health priority and a scientific puzzle [6–8]. Adding to the complexity of reproductive health, the demographic distribution of women of reproductive age is shifting to encompass older and older ages as a product of increased schooling and medical advancements, including in the area of assistive reproductive technologies (ART) [9, 10]. Whereas 1% of births were to women aged 35 and older in 1970, 8% of births were to women aged 35 and older in 2006 [11••]. Older women, particularly those who have undergone some form of ART, bring to the experience of pregnancy their own unique set of risk and resilience factors. Evolving and innovative models of reproductive health, then, are not just a worthwhile investment, but also deeply necessary—both for the purpose of solving the intergenerational puzzle that is reproductive health and for the purpose of evolving with the changing reproductive age bracket. Reproductive healthcare stereotype threat (HCST), on the basis of age and other factors, may be an important new lens for understanding and interrogating reproductive health differences and disparities.<sup>1</sup> The term HCST was recently coined and presented as an overlooked psychosocial determinant of healthcare and larger health experiences and disparities [14, 15••, 16••, 17]. The idea of HCST grew out of the broader stereotype threat literature, which demonstrates that individuals who belong to stigmatized social groups (i.e., groups for whom popularly held negative stereotypes exist) experience the threat of being judged by, and/or of personally confirming, negative group-based stereotypes when operating in stereotype-relevant domains [18, 19]. For instance, females indicate less interest in math [20–22], leadership roles [23], and other traditionally masculine domains [24–27] when female stereotypes are made salient. *HCST—a healthcare-specific form of stereotype threat—is defined as the threat of being judged by, and/or of personally confirming through one’s own actions, behaviors, or outcomes, negative group-based stereotypes that are salient in healthcare settings and in relation to health services more broadly* [15••, 16••]. Notably, the types of health- and healthcare-relevant stereotypes that are called to mind differ with the particular dimension(s) of social identity under threat. For example, with respect to ethnicity/race-based HCST, negative health-relevant stereotypes include inferior intelligence, lower status, greater likelihood of engaging in risky behaviors and lifestyle choices, and being less deserving or needing of the best available care [14, 15••, 16••, 17, 28, 29, 30]. Indeed, a stunning survey of medical students and residents

demonstrated that African American patients are perceived as possessing innate biological differences and that these perceptions lead to poor assessment and treatment recommendations (e.g., African Americans were rated as having less sensitive nerve endings than Whites, likely contributing to the less aggressive pain treatment commonly received by African Americans) [30]. In contrast to ethnicity/race-based HCST, age-based HCST is likely the product of a very different set of stereotypes, including being past one’s prime and lower likelihood of being in optimal health. I propose that age-based HCST has particular relevance for women’s reproductive health and healthcare experiences. For (relatively) older women experiencing pregnancy or seeking to become pregnant—particularly women who meet the criterion for advanced maternal age (i.e., 35 years of age or older)—prominent medical and sociocultural messages about precipitously declining fertility, a ticking biological clock, and exponentially heightened risks to both mother and child can result in age-based reproductive HCST, which may have important consequences for prenatal mental and physical health. Please refer to Fig. 1 for a conceptual model detailing the hypothesized process and outcomes of age-based reproductive HCST. The purpose of this review is to introduce the theory of age-based reproductive HCST. It is proposed that age-based reproductive HCST is an important contributor to reproductive health and healthcare experiences among women who are ‘older’ as far as reproduction is concerned. Although the process of age-based reproductive HCST is hypothesized to be of critical importance to both physical and mental health, this review focuses largely on mental health. The emerging literature on HCST and the broader literature on the general phenomenon of stereotype threat are reviewed. These literatures are then integrated with the reproductive health literature.

### Interactions Among the Stereotype, the Threat, and Perceived and Objective Realities

It is important to note that, in the conceptualization of age-based reproductive HCST, it is not suggested that heightened maternal-fetal risk with advanced maternal age is not real. Drawing a parallel with ethnicity/race-based HCST, for instance, it is empirically documented that ethnic/racial minorities, on average, have a greater risk, relative to Whites and most other groups, of developing a wide range of physical health conditions, including obesity and hypertension [2••, 31]. It is also well-documented that ethnic/racial minorities disproportionately live in poverty [32]. Images depicting ethnic/racial minorities as being at greater risk of engaging in harmful lifestyle choices that to these adverse health outcomes and/or being of lower SES, then, can be stereotypical—in that they are overgeneralizations, resistant to disconfirming evidence, and overlook important individual differences—even when they reflect reality to at least some degree. Similarly, it is

<sup>1</sup> Differences and disparities are distinguished here. A health difference is one that is expected. For instance, female fertility rates differ by age. This is an expected and natural difference (even as it is evolving to some degree). Disparities are differences in health that are unnecessary, avoidable, and unjust [12, 13]. For instance, the high rate of adverse birth outcomes among African American women, as compared to White women of the same age, is a disparity.



**Fig. 1** A process- and outcome-focused model of age-based reproductive healthcare stereotype threat (HCST)

well-documented that advanced maternal age is associated with adverse fertility, pregnancy, and birth outcomes, including, among other things, decreased fertility [33] and increased risk of miscarriage [34], gestational hypertension [35], preeclampsia [35], chromosomal abnormalities [34], and autism. Whereas, on average, a woman in her 20s has a 20–25% likelihood of conceiving during any given menstrual cycle, a woman in her 30s has a 15–20% likelihood of conceiving during any given menstrual cycle, and a woman in her 40s has a 5% likelihood of conceiving during any given menstrual cycle [36]. Female fertility typically peaks around age 24 and begins to decline between the ages of 25 and 32 [37, 38].

By contrast, the relationship of maternal age to prenatal and postpartum mental health is more complex. The factors that put expectant mothers at risk for outcomes such as pregnancy anxiety and postpartum depression are highly correlated with age, with many risk factors being far more common among younger

women, but a few robust predictors becoming more prevalent with advanced maternal age. For instance, unintended pregnancy, the lack of a stable relationship with the baby’s father or other sources of social support, and financial instability and other forms of stress are reliable predictors of pregnancy anxiety and postpartum depression [3, 4, 39, 40, 41, 42, 43, 44•, 45•]. Both in terms of lived realities and popular stereotypes, these social and economic circumstances are more commonly associated with younger mothers. However, past pregnancy loss and past and present pregnancy complications are also robust predictors of prenatal and postpartum mental health challenges, including pregnancy anxiety and postpartum depression and its variants (i.e., postpartum blues, depression, and psychosis) [1•, 2•, 3, 4, 39, 44•]. Therefore, not only are older women more likely to experience difficulty becoming pregnant and carrying a pregnancy to term, they may also be more likely to suffer from pregnancy anxiety and postpartum depression directly as a result of being

older and the perceived and actual risks associated with this older age. These prenatal mental and physical health experiences, in turn, affect postpartum mental and physical health, as well as pregnancy and birth outcomes that have been shown to affect offspring in early childhood and throughout the lifecourse and even into subsequent generations [1•, 2•, 3, 4].

Thus, age-based reproductive HCST is put forth as a theory of the psychosocial dimensions of reproductive health outcomes, both mental and physical, and differences and disparities among older women. This psychosocial process also takes into account the tremendous individual variability in overall health, fertility potential, and prenatal health, including susceptibility to prenatal and postpartum anxiety, blues, depression, and psychosis. It also accounts for the arbitrary aspects of the age 35 cutoff for defining advanced maternal age. The psychosocial process of age-based reproductive HCST may interact with, but in no way diminishes the importance of, the realities of human biology—one of which is that the reproductive span of human females is limited in both length and quality.

### Pregnancy: a Universal and Critical Domino

Pregnancy is a universal experience. Pregnancy is a health event that occurs with great frequency across time and space. It also happens within a restricted timeframe (10 months; rather than nine, as is commonly believed) and under reasonably well-defined parameters. The outcomes of pregnancy are clear and relatively easy to measure [46•, 47]. They pertain to both mother and neonate antenatally, as well as during labor, delivery, and the first weeks to year of the infant's life.

Pregnancy can be thought of as a domino because it leads to a cascade of outcomes—which are by and large positive, but can also be challenging—that affect the woman and her offspring, as well as their larger family and society [48, 49]. In addition, the domino that is pregnancy, including the birth of a healthy child, affects the woman for the rest of her individual lifecourse. Even more strikingly, this domino ripples across multiple generations. Reproduction is the first link between generations. Regarding the intergenerational transmission of health, the outcomes of a woman's pregnancy—including both the mental and physical health outcomes that are likely to be affected by age-based HCST among women of advanced maternal age—affect fetal development in utero, birth outcomes, early childhood outcomes in offspring, the future reproductive potential of offspring, susceptibility to disease and other markers of aging in offspring, and, therefore, reproductive span, healthspan, and lifespan in offspring and also their offspring.

### Age-Based HCST as a Stressor Affecting Prenatal Health

Given the significance and sensitivity of the prenatal period, it is no surprise that a large literature has examined links of physical and psychological stressors to pregnancy outcomes [1•, 2•, 3, 4, 6, 39–41, 50, 51, 52•, 53, 54•]. Indeed, general stressors, as well as those specific to certain aspects of social identity—particularly ethnicity/race and social class—have demonstrated links to a wide range of prenatal (e.g., pregnancy anxiety), labor (e.g., preterm labor and other medical complications), birth (e.g., birthweight), and postpartum (e.g., depression) outcomes [1•, 2•, 3, 4, 6, 42, 50, 51, 55]. However, to my knowledge, neither stereotype threat nor the more specific application of stereotype threat that is the focus of this paper, HCST, has been examined in relation to pregnancy or other aspects of fertility.

Stereotype threat has been most commonly studied in African Americans and females [18, 19, 56–58]. Further, stereotype threat research has focused on performance domains, particularly academics and leadership, because a central tenet of stereotype threat theory is that the experience of stereotype threat creates conditions of cognitive load, resulting in performance decrements [57, 59]. For example, African Americans have been shown to perform poorly relative to Whites on standardized tests only when under conditions of stereotype threat, such as when having to check a box identifying their ethnicity/race at the start of the testing session [60]. When the possibility of stereotype threat is eliminated or reduced in the testing environment, the African American-White disparity in test performance disappears [18, 61, 62]. Similarly, explicitly countering female stereotypes removes gender differences in performance in stereotypically masculine domains, such as math and leadership [63–65].

The general phenomenon of stereotype threat is regarded as a psychosocial stressor, and, as with other stressors, stereotype threat has immediate physiological consequences, which have implications for mental and physical health [66•]. The general experience of stereotype threat has been experimentally linked to increases in negative affect [59] and blood pressure and other physiological indicators of stress [28, 67]. Although stereotype threat has previously been linked to immediate physiological consequences, little is known, empirically-speaking, about the long-term mental and physical health consequences of stereotype threat given the traditional cross-sectional experimental paradigm that is used to study stereotype threat. It is hypothesized that, over time, individuals with stigmatized identities disidentify with, or disengage from, the stereotyped domain in order to avoid the psychological, social, and performance consequences of stereotype threat, including poor self-esteem and/or poor performance [22, 68]. Nevertheless, this long-term process of disidentification largely remains an open empirical question.



HCST is one of the first applications of stereotype threat theory that examines the longer-term, rather than only immediate, mental and physical health consequences of the threat of being judged by negative group stereotypes in stereotype-relevant domains [16••]. HCST is also the first direct application of stereotype threat to healthcare and health experiences and disparities, as well as to the specific stereotypes that are salient in healthcare settings and in relation to health services [15••, 16••]. Further, HCST is a critical application of stereotype threat theory that examines domains that are directly critical to livelihood—namely healthcare and broader health service use [15••, 16••]. To date, it is unclear how the process of stereotype threat-induced disidentification unfolds in domains that are critical to livelihood, including the domain of healthcare. HCST has been linked to underutilization of preventive care, physician distrust, and heightened anxiety in healthcare settings [15••, 16••]. HCST has also been hypothesized to lead to avoidance of healthcare and delayed care in the face of ambiguous or chronic health problems [15••, 16••]. The very solution to age-based health risks, including age-based reproductive health risks, is healthcare. Therefore, it seems unlikely that age-based reproductive HCST leads to delay or avoidance of prenatal care. Nevertheless, it likely does lead to greater anxiety related to prenatal care.

Previous work has demonstrated that HCST is predictive of immediate [15••] and longer-term [16••] indicators of health under both experimental and observational conditions. Using observational survey methods, HCST has been linked to downstream indicators of, and disparities in, mental and physical health in older adulthood, including depression, poor self-rated health, and hypertension [16••]. Importantly, HCST has also been linked to adverse healthcare outcomes that, in and of themselves, have potentially important and cumulative health implications, including use of preventive care, physician distrust, dissatisfaction with healthcare, and greater healthcare-specific anxiety [15••]. If HCST is, in fact, experienced during pregnancy on the basis of age and/or other factors as predicted (ethnicity/race-based HCST and SES-based HCST [15••, 69], as well as weight-based HCST and religion-based HCST, are likely also related to pregnancy and other reproductive outcomes and disparities in important ways), this is a critical application of HCST theory specifically and stereotype threat theory more broadly. This also raises important questions about the long-term consequences—as in the 10 months of pregnancy, but also as in the lifespan and intergenerational consequences—of the HCST process.

As previously mentioned, no empirical studies have examined any type of HCST (i.e., age-based, ethnicity/race-based, or otherwise) in pregnant, or trying to conceive, samples to date. A 2014 [15••] experimental study demonstrated that when primed with negative stereotypical images of African American women's reproductive health, highly identified African American women were most likely to experience ethnicity/race-based HCST. It seems plausible that a parallel process

occurs in relation to reproductive health, and pregnancy specifically, on the basis of age.

### Changes in Reproductive Potential Over Time and Intersections with Ethnicity/Race, SES, and Other Aspects of Social Identity

Although the experience of declining fertility with age is universal to human females, the rate of change is not uniform across individuals [70•, 71]. It is also not uniform across population groups or subgroups [72–74]. In addition, as the 2014 HCST study suggests [15••], it is highly likely that age-based reproductive stereotypes are likely compounded by stereotypes arising out of the other potentially stigmatized aspects of identity with which they intersect, including ethnicity/race, SES, sexual orientation, and body composition. It is interesting to note, however, that both the stereotype and the reality of older mothers is that they are more educated and affluent. Further, it is often the case that mothers of color, including African Americans, certain Asian subgroups, Latinas, and Middle Easterners and North Africans, are stereotyped as having more children and having them earlier in life [11••]. Therefore, popular stereotypical images of advanced maternal age and its consequences do not account for women of color to the same degree that they do White women. Yet, because of their lower social standing and ascribed value in our society [31, 32], and the psychophysiological weathering and premature aging that result from this lower social status [1••, 2••, 3, 4, 42, 43, 50, 51, 53, 54•], women of color are thought to experience more rapid declines in their fertility with age [53, 54•]. As a result, women of color, and their children, may actually be most vulnerable to age-based HCST and its downstream healthcare and reproductive, physical, and mental health consequences. Further, women of color may have fewer family or peer examples of women successfully having children later in life, thereby compounding the effects of age-based HCST. Sexual orientation and gender identity represent additional, important layers that must be taken under consideration, as same-sex couples typically require medical intervention (e.g., insemination with donor sperm) to achieve pregnancy, regardless of age or fertility status. This presents unique practical and social challenges, including the need to discuss a potentially stigmatized identity with doctors.

### Susceptibility to Age-Based Reproductive HCST

People are most susceptible to stereotype threat when they are (a) highly identified with the stereotyped identity and/

or (b) highly identified with, or invested in, the stereotyped domain [75, 76]. For example, African Americans and females for whom being African American or female is a central aspect of the self will be more susceptible to stereotype threat and its deleterious psychological, social, and performance consequences when operating in domains in which popular negative stereotypes of African Americans or females are common [58, 75, 77]. Similarly, African Americans or females who are highly invested in the stereotyped domain—for example, academic success or success in math, the sciences, and/or leadership roles—are most susceptible to stereotype threat and its cascade of deleterious consequences [66•, 78–80]. Therefore, in terms of susceptibility produced by the stereotyped identity, women for whom age is a central aspect of identity (even if just in relation to their fertility, pregnancy, and broader reproductive experiences) will be more susceptible to HCST. On the other hand, women for whom age is not a central aspect of identity, in general or in relation to reproduction, may be less susceptible to the prenatal healthcare or health consequences of age-based reproductive HCST. Similarly, a woman whose subjective, or felt, age is lower than her objective, or actual, age may view the age-based stereotypes of high-risk fertility and pregnancy to be less relevant to her, thereby reducing the likelihood that she will experience reproductive HCST on the basis of her age. In terms of susceptibility produced by the stereotyped domain, women who are highly identified with, or invested in, the role of motherhood may be more likely to experience age-based reproductive HCST. Personally and culturally, the importance of becoming a mother and of having biological children in terms of self-definition and status in family and community likely also produce increased susceptibility to age-based reproductive HCST for older women hoping to become pregnant in the near future or who are pregnant [81]. This has important and interesting implications for women who have invested thousands of dollars and months (if not years) of their lives in assistive reproductive technologies, as in the case of *in vitro* fertilization. This also has implications for women experiencing primary infertility, versus those who are experiencing secondary infertility (i.e., women who are experiencing difficulty conceiving or carrying a pregnancy to term following the natural conception and birth of one or more biological children [82]). For instance, it may be that older women seeking to become pregnant for the first time are more susceptible to age-based reproductive HCST, whereas older women seeking to get pregnant for the second, third, or fourth time may be protected to some degree by already having a history of successfully conceiving and delivering a healthy baby and by already possessing the role of mother.

## Unique Features of Age-Based HCST

To date, HCST has most commonly been studied as a function of ethnicity/race and among African Americans as compared to Whites. As of this writing, one study has also examined HCST among Latinos and other socially stigmatized groups (e.g., older adults), as well as on the basis of multiple potentially stigmatized aspects of identity. In addition to ethnicity/race, these include socioeconomic status (SES), gender, age, and body composition (i.e., normal weight, overweight, obese) [16••]. The psychosocial experience of age-based HCST, when compared to the experience of HCST on the basis of other potentially stigmatized aspects of identity, possesses key unique features that should be taken under consideration. Critically, age changes over time. This is similar to weight, which often changes over time, and also possibly SES, which—although less likely—can change over time. This is in contrast to dimensions of identity that are generally stable over time (e.g., ethnicity/race, gender, sexual orientation). Second, age—like SES, religion, or sexual orientation—may be concealable or, at least, not readily visible [83–89]. Again, this is in contrast to ethnicity/race or gender, which generally are readily visible (whether the visible perceived identity accurately matches the self-identity is another question altogether). This is both interesting and important because the ability to conceal older age may suggest a youthfulness that is not just skin deep. In fact, there are several lines of evidence linking youthfulness and longevity to fertility [1••, 90•, 91, 92]. Research on centenarians has demonstrated that women who have their last child after the age of 33 have twice the odds of living to age 95 than women who have their last child by age 30 or younger [90•]. Patterns such as these are likely, at least in part, attributable to increased likelihood of delayed childbearing among more affluent women, who also have longer life expectancies because they are more affluent (i.e., the SES-health gradient). However, this may also suggest that women who remain fertile for longer are more youthful at a biological level and, therefore, have longer lifespans in addition to reproductive spans [1••, 90•, 91, 92].

There is a complex constellation of medical, psychobiological, and sociocultural factors that affect the ability to become and stay pregnant, as well as to experience a pregnancy in which both mother and infant are mentally and physically healthy. I propose that reproductive HCST on the basis of age (and other potentially stigmatized aspects of identity as well) is an overlooked force among these determinants of healthy pregnancy. There are a number of critical implications if age-based HCST is, in fact, a potent force in the prenatal mental and physical health outcomes of women with advanced maternal age

and other women who worry that they have waited too long to have children. Growing evidence suggests that physicians, quite literally, cannot empathize with the pain of African Americans and likely other minority patients [30]. This phenomenon (i.e., difficulty empathizing with patients who are different from self or otherwise stigmatized) is in some ways similar and in some ways different for female patients, including pregnant women with advanced maternal age. As of 2017, a majority (64%) of practicing obstetricians continues to be male [93]. In addition, the realities of male biology are very different from those of female biology. Taken together, these two factors likely indicate that it is difficult for obstetricians to empathize with their patients. Although not specific to gynecological, fertility, and/or obstetric care, multiple recent studies have demonstrated that patients of female physicians fare better mentally and physically than patients of male physicians [94–95]. It is important to note, however, that the ability of male obstetricians to empathize with their pregnant patients may be affected, not just by first-hand experience, but also by vicarious experience. Male physicians may witness, through people they care for deeply (their mothers, sisters, wives, daughters, and friends), what it is like to be a female in the American healthcare system. This may translate—in at least some cases and to at least some degree—to a greater ability to empathize with female patients despite the lack of first-hand experience with the stereotypes and reproductive HCST experienced by females.

### Measurement of HCST and Age-Based Reproductive HCST

Stereotype threat is typically investigated using an experimental design, where participants are randomly assigned to a Threat or No-Threat Condition. If stereotype threat is, indeed, operating, participants with the stereotyped identity (e.g., ethnic/racial minorities, females, expectant mothers who are 35 years+) in the Threat Condition will perform more poorly on a stereotype-relevant task, or have poorer outcomes within the stereotyped domain, than all other participants. This includes research participants randomly assigned to the Threat Condition who do not possess the stigmatized identity (e.g., non-minorities, males, younger expectant mothers), as well as all participants in the No-Threat Condition (including those with the stigmatized identity). A similar experimental paradigm can be used to study HCST; and, in fact, the first studies of HCST [14•, 15•] were experimental.

When use of a traditional experimental paradigm to investigate HCST is not possible—as in the case of large-scale survey research—a brief self-report measure of Explicit HCST has been used [16•]. Table 1 presents a five-item

measure of general Explicit HCST and a modified version to be used in studies of age-based reproductive HCST specifically. The age-based reproductive HCST measure contains the five core items plus two additional optional items.

### Conclusion and Recommendations for Insurers, Medical Practice, Institutional and Public Health Policy, and Future Research

Unlike other social determinants of health and healthcare experiences, including poverty and discrimination, stereotype threat is highly modifiable. Specifically, addressing implicit and explicit stereotypes in the environment can remove stereotype threat and its deleterious consequences [60, 63, 66•, 96, 97]. Early evidence suggests that HCST, similarly, is highly modifiable through internal, interpersonal, and external shifts that address patients, healthcare providers, and medical settings and larger contexts shaped by insurers (refer to HCST training, available through Anthem, for specific strategies: <https://www.anthem.com/hcst/>) [98]. Critically, the health insurance sector can provide important leadership by expanding the definition and purview of cultural competency to include age and other aspects of social identity that intersect with ethnicity, race, language, and other traditionally recognized indicators of culture. In addition, symbolic and deliberate messages of age diversity in obstetric offices and other prenatal care facilities may make negative age-related reproductive health stereotypes less salient, thereby reducing the experience of age-based reproductive HCST and its cascade of deleterious psychosocial, affective, behavioral, cognitive, psychophysiological, and relational consequences. An obstetric office where it is common to see older expectant mothers may be one such symbolic message that could alleviate age-based reproductive HCST and its consequences. In terms of deliberate messages, public health messages in the form of posters, brochures, or other media that women encounter in the course of prenatal care, which contain negative stereotypes, or are shame- or fear-based, may increase the likelihood that pregnant women of advanced maternal age experience age-based reproductive HCST. On the other hand, public health messages that convey positive messages about the health potential of older expectant mothers and their children may help to reduce age-based reproductive HCST and its negative mental as well as physical health consequences. Cross-sectional and longitudinal experimental and observational research are needed to interrogate and clarify the role of age-based reproductive HCST (and other forms of reproductive HCST) in healthcare and health experiences and disparities among the evolving segment of the human female population of reproductive age.

**Table 1** Brief Self-report Measures of Explicit Healthcare Stereotype Threat: General and Specific to Age-Based Reproductive Healthcare Stereotype Threat**Instructions for Researchers.**

In both the general measure and the reproductive HCST measure, the identity (in bold) can be replaced by another identity of interest.

For instance, **my age** or **my ethnicity or race** can be replaced by:

**my gender**

**my social class, or how much money/education I have**

**my sexual orientation**

**my gender identity**

**my marital status**

**my religion**

**my size or my weight**

**Instructions to Provide for Respondents.**

On a scale of 1 to 5, where 1 means *Strongly Disagree* and 5 means *Strongly Agree*, please rate your agreement with the following items.

**Response Set.**

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

**Explicit Healthcare Stereotype Threat Measure, General**

1. While receiving (or thinking about receiving) healthcare, I have worried about being judged negatively because of **my ethnicity or race**.
2. While receiving (or thinking about receiving) healthcare, I have worried that the doctor's evaluation of my health may be negatively affected by **my ethnicity or race**.
3. While receiving (or thinking about receiving) healthcare, I have worried that **my ethnicity or race** might influence the recommendations, tests, and/or diagnoses I receive.
4. While receiving (or thinking about receiving) healthcare, I have worried that I might confirm negative stereotypes about people of **my ethnicity or race**.
5. While receiving (or thinking about receiving) healthcare, I have worried that the doctor might negatively judge my ability to be healthy because of **my ethnicity or race**.

**Explicit Age-Based Reproductive Healthcare Stereotype Threat Measure**

1. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried about being judged negatively because of **my age**.
2. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried that the doctor's evaluation of my health may be negatively affected by **my age**.
3. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried that **my age** might influence the recommendations, tests, and/or diagnoses I receive.
4. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried that I might confirm negative stereotypes about pregnancy in women of **my age**.
5. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried that the doctor might negatively judge my ability to have a healthy pregnancy because of **my age**.

**Extended Version Includes the Below:**

6. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried that the doctor might judge my decision to have a child because of **my age**.
7. While receiving prenatal care (or thinking about receiving prenatal care in the future), I have worried that the doctor might judge me for not having children sooner because of **my age**.

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**Compliance with Ethical Standards**

**Conflict of Interest** Cleopatra M. Abdou declares no potential conflict of interest.

**Human and Animal Rights and Informed Consent** This article contains no studies with human or animal subjects performed by any of the authors.

**References**

Papers of particular interest, published recently, have been highlighted as:

- Of importance
  - Of major importance
1. •• Abdou CM, Dominguez TP, Myers HF. Maternal familism predicts birthweight and asthma symptoms three years later. *Soc Sci Med.* 2013;76:28–38. **The epidemiological paradox and other health literatures have hypothesized that cultural resources contribute**



- to better outcomes during pregnancy and early life, but few studies have tested this empirically. This study investigated whether the nonmaterial cultural resource of familism was protective against low birthweight and asthma symptoms three years later in African American, Latino, and White families, most of whom were facing socioeconomic disadvantage. Familism, independent of ethnicity and lifespan family socioeconomic position, was found to be associated with better outcomes—namely, higher birthweight and fewer asthma symptoms by age three.**
- 2.●● Abdou CM. Minority aging before birth and beyond: life span and intergenerational adaptation through positive resources. In: Whitfield K, Baker T, editors. *Handbook of minority aging*. New York: Springer Publishing Company; 2013. p. 9–24. **This chapter introduces Aging Before Birth and Beyond, a lifespan and intergenerational model of human development. It also directly links this lifespan and intergenerational view of aging to minority health and health disparities. It discusses the importance of positive psychology, and nonmaterial cultural resources in particular, for advancing understanding of heterogeneity in minority health. This discussion is guided by the Culture and Social Identity Health Theory (CSIH), a theoretical framework for examining independent and interactive effects of culture and social identities on health. The four premises of this theory include (1) social identities impose powerful constraints on culture by making certain beliefs, attitudes, and experiences more salient, (2) culture can have direct effects on health that are independent of links to social identity, (3) culture often exerts its effect on health by moderating social identity-based (e.g., ethnic and socioeconomic) disparities, and (4) intrapersonal and interpersonal processes—including the psychosocial process of healthcare stereotype threat—underlie both culture and social identity effects on health.**
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