Gender Differences in Fear and Embarrassment as Predictors of New Product Adoption

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**Abstract**

We examine how fear and embarrassment associated with the usage of a new product influence product adoption. With some notable exceptions, the majority of work in the extant literature on individual differences studies educated, relatively wealthy individuals in industrialized countries. In this study, we complement and extend prior work on sexuality and individual differences by exploring the uptake of a new medicine, pre-exposure prophylaxis (PrEP) amongst 1823 at-risk individuals such as male and female sex workers and drug users from countries with high HIV prevalence. The results show that fear of contracting HIV encouraged PrEP adoption while embarrassment hindered PrEP adoption. While these results might not be particularly surprising, we found it noteworthy that no gender differences for fear exist. Furthermore, the findings show that the effect of embarrassment differed across genders with the impact of embarrassment being stronger for females and transgender individuals compared to cissexuals. Moreover, we show that these effects were driven by public and private embarrassment in cisgender and transgender individuals, respectively. The current findings contribute to the important work on sexuality, gender differences, fear, embarrassment, and the uptake of new products for high-at risk or stigmatized individuals and members of marginalized communities. The findings of this research also offer relevant practical implications for communicating strategies to facilitate the uptake of new products such as a new medicine among members of less wealthy, educated groups of society.

**1. Introduction**

The human immunodeficiency virus (HIV) continues to be a serious global health challenge with approximately 1.8 million people becoming newly infected in 2017 (WHO, 2018). One way of preventing the spread of HIV is through a new medicine and the use of pre-exposure prophylaxis (PrEP), a preventive drug that reduces the risk of contracting HIV by up to 99% (The Independent, 2018). Despite its efficacy, PrEP uptake has been slow since its FDA approval in 2012 (Eaton, Driffin, Bauermeister, Smith, & Conway-Washington, 2015). One challenge is related to awareness, while other barriers to adoption relate to fear and embarrassment of taking this new medicine. Specifically, only 27% of young homosexual men in a cross-sectional survey were aware of PrEP, (Bauermeister, Meanley, Pingel, Soler, & Harper, 2013), while 28% of primary care providers surveyed felt familiar with prescribing PrEP (Petroll, Walsh, Owczarzak, McAuliffe, Bogart, & Kelly, 2017). To address this lack of awareness, our research ascertains the perceived barriers to PrEP adoption by highlighting how fear and embarrassment affect new product adoption. Importantly, we study gender differences as part of our analysis of how fear and embarrassment may influence new product uptake. Specifically, this study considers the effects of fear, and embarrassment on PrEP adoption across various gender identities in high HIV-risk countries. A notable contribution of our study is the sample that we use in our research. We complement and extend the existing body of work on sexuality, gender differences, fear, embarrassment, and the uptake of new products for high-at risk or stigmatized individuals. By studying individuals who are often underrepresented in academic research, namely less wealthy, educated groups of society across the world and identifying gender differences in the effects of fear and embarrassment on PrEP adoption among members of high-risk communities such as male and female sex workers and drug users, we aim to better inform sexual health communications that often use various emotions to promote preventive sexual behavior.

*1.1. Fear*

Fear is widely used in health communications to evoke behavioral change (Witte & Allen, 2000), ranging from the Grim Reaper to warn the public of the fatal effects of HIV to graphic images of lung cancer on cigarette packs. Defined as an unpleasant emotion triggered by negative and uncertain events, fear promotes precautionary and self-protective actions (Frijda, Kuipers, & ter Schure, 1989). Correspondingly, fear is often evoked in health communications by presenting a threat (e.g. HIV) to which the audience is susceptible (e.g. unprotected sex increases your risk of HIV) and severe (e.g. AIDS is fatal) in an attempt to promote protective action (e.g. PrEP adoption) (Witte, Meyer, & Martell, 2001).

Despite its widespread use in health communications, fear can backfire (e.g. Beck, 1984; Keller & Block, 1996; Mongeau, 2013; Ruiter, Kessels, Peters, & Kok, 2014), eliciting defensive reactions such as risk denial, biased information processing, and less attention to health-promotion messages (Green & Witte, 2006; Kok, Bartholomew, Parcel, Gottlieb, & Fernández, 2014). To explain these boomerang effects, drive theories posit an inverted U-shaped relationship between fear and behavioral change, with low to moderate levels of fear driving protective actions, and high levels of fear resulting in avoidance (Hovland, Janis, & Kelley, 1953; Janis & Feshbach, 1953). Similarly, Protection Motivation Theory (PMT; Rogers, 1983) and Extended Parallel Process Model (EPPM; Witte, 1992) postulate that varying appraisals of fear appeals explain these boomerang effects. These theories posit that fear instigates threat appraisals (i.e. individuals’ perceptions of threat severity and personal susceptibility) and coping appraisals (i.e. the belief that the recommended behavior will be effective in mitigating the threat - response efficacy, and that one is capable of performing the recommended behavior - self-efficacy). Whilst high self and response efficacies encourage adaptive responses (e.g. condom usage; Abraham, Sheeran, & Abrams, 1994), high severity and susceptibility backfire and elicit defensive responses (e.g. reducing safe sex intentions; van der Velde & Van der Pligt, 1991) (Ruiter et al., 2014; Witte & Allen, 2000).

Together, these theories suggest that self and response efficacies underlie the effectiveness of fear in health communications. Thus, it is unsurprising that fear often backfires in “audiences (that) do not believe they are able to effectively avert a threat” (Witte & Allen, 2000; p.606). Fear-inducing interventions were associated with lower increases in HIV knowledge and condom use, especially in populations of high HIV incidences (Earl & Albarracín, 2007). Given that the cost of PrEP is prohibitively high, the same issue could plague PrEP campaigns, especially among at-risk individuals. Therefore, while we expect that fear increases PrEP adoption, the role of other emotions to enhance the effectiveness of fear must be considered.

*1.2. Embarrassment*

Weak correlations between fear and behavioral change across several meta-analyses, *r* =.15 Witte & Allen (2000), *r* =.21 (Boster & Mongeau, 1984), *r* = .20 (Mongeau, 1998) corroborates a need to examine other emotions in health communications. While the aforementioned theories explain the effects of fear in health communications, the same appraisals could also evoke other emotions. For instance, Nabi and Myrick (2018) found that hope was associated with self-efficacy in fear appeals. Given the taboo nature of sexual behavior, perceived susceptibility to sexual diseases could also elicit embarrassment. Qualitative research shows that embarrassment is a crucial emotion when it comes to sexual health (van Teijlingen, Reid, Shucksmith, Harris, Philip, Imamura, & Penney, 2007), inhibiting condom use (Bell, 2009), and lowering acceptance rates for chlamydia screening (Balfe, Brugha, O’Donovan, O’Connell, & Vaughan, 2010).

Embarrassment is defined as an emotion that occurs when social norms are violated (Edelmann, 1987; Miller & Leary, 1992; Dahl, Manchanda, & Argo, 2001) in public (when appraised negatively by others) and in private (when one appraises oneself and violates one’s self-concept) (Krishna, Herd & Aydinoğlu, 2015). Correspondingly, public embarrassment pertains to a concern for one’s public image, as appraised by others while private embarrassment relates to negative self-appraisals and violations of personal standards (Krishna et al., 2015). Thus, individuals who feel public embarrassment often try escape social situations to avoid other-appraisals (Leary & Kowalski, 1995). For instance, individuals more likely to avoid purchasing condoms in the presence of others than alone (Dahl et al., 2001). Conversely, private embarrassment is less concerned about social judgement and characterized by greater self-awareness (Krishna et al., 2015). Thus, individuals who feel private embarrassment are more concerned with their self-concept and feel less embarrassed when purchasing Viagra for pleasure than for impotence (i.e. a purpose that is detrimental to self-concept) (Krishna et al., 2015). Given that PrEP adoption could disclose one’s private sexual behaviors, it could be a source of public and private embarrassment. Thus, we expect embarrassment to impede PrEP adoption.

Although meta-analyses revealed no gender differences in the emotion of embarrassment (Else-Quest, Higgins, & Morton, 2012), men and women do adopt different coping strategies. When faced with the embarrassing task of acquiring condoms, men were more likely to buy from male cashiers while women masked condom purchase with additional items (Arndt & Ekebas-Turedi, 2016). These findings suggest that genders cope with the embarrassment of sex-related consumption differently. With existing research reliant on cisgender samples, there is a need to ascertain how embarrassment affects transgender individuals. Moreover, due to heteronormative attitudes, transgender individuals are often embarrassed when seeking sexual health services (Albuquerque et al, 2016). Therefore, addressing embarrassment is imperative in PrEP communications where fear might backfire for transgendered individuals who are most at-risk.

*1.3. The Present Research*

The purpose of this study is to examine how fear and embarrassment affect PrEP adoption amongst at-risk individuals. Since studies showed no gender differences in acceptance of fear appeals (Witte & Allen, 2000), we hypothesize that fear increases PrEP adoption across all genders (Hypothesis 1). While we expect embarrassment to decrease PrEP adoption (Hypothesis 2), the study will also identify gender differences by examining if private versus public embarrassment affects cisgender and transgender individuals differently. Using concealment as a proxy for public embarrassment, we examine the following conceptual framework:

Figure 1 Conceptual framework

Controls:

Risky sexual or non-sexual behaviours,

Age

**2. Method**

*2.1. Participants*

1823 participants (1122 females; 22 transgenders) from eight different countries with high HIV incidence, including Thailand, Ukraine, India, Peru, South Africa, Botswana, Uganda, and Kenya were included. 35% of the participants were aged between 19-24 and 25.3% were aged between 25 to 30. Participants were the potential user groups for PrEP, including sex workers, injecting drug users, young women, males who have sex with men, and serodiscordant couples.

*2.2. Data collection*

Funded by the *Bill & Melinda Gates foundation*, we interviewed participants on their attitudes towards PrEP adoption despite significant purchase barriers, including potential side-effects, cost, uncertain product efficacy, and associated social stigma associated. Participants received a brief description of product attributes, highlighting routes of administration, side effects, and the need for subsequent health tests. It was stressed that the product was still being tested and its attributes remained uncertain.

*2.3. Measures*

Fear and embarrassment were measured with the following questions, “How afraid are you of contracting HIV/AIDS, if at all?” and “How embarrassing, if at all, would you find it to take PrEP?” on four-point Likert scales anchored at “*not at all/very*”. Participants were also asked “Would you want your partner or partners to know if you were taking PrEP, or not?” on a five-point Likert scale “*No, definitely not/Yes, definitely*”. As public embarrassment is concerned with social judgment (Krishna et al., 2015), individuals would conceal sensitive information from partners. Thus, response to this question was reverse coded. Higher scores indicated greater concealment and thus greater public embarrassment.

Participants indicated their willingness to adopt PrEP (e.g. adopt the product / adopt the product immediately when available) given different conditions (e.g. side effects, regular HIV/AIDS test required, monetary cost, using condoms required, non-100% of effectiveness) on four-point Likert scales anchored at “*No, definitely not/ Yes, definitely*”. These six items were averaged to form a total adoption score (α = .81).

Risky sexual and drug-taking behaviors were included as control variables. Risky sexual behavior was measured by the number of sexual contacts, and frequency of unprotected sex (e.g. van Lankveld, Platteau, van Montfort, Nieuwenhuijs, & Syroit 2015; Birthrong & Latzman, 2014). Since the sample included sexual workers, we did not use the number of sexual partners as an indicator and relied on responses to “In the last month, how often have you used condoms with your sexual partner or partners”. The variable is reverse-coded. A high score indicated greater risky sexual behavior. As drug-taking typically reflects risky behavior (e.g. van Lankveld et al., 2015), it was measured using the question, “In the last month, how many times have you used injecting equipment that is not clean or has been used before, for example, a used needle.” A high score indicated greater risky behavior.

Age was measured in 11 age groups with different ranges (e.g. “up to 15”, “16-18”, “19-24”). Gender was measured as male, female, or transgender. Male was dummy-coded as male =1 and female= 0; Female was dummy-coded as male=0 and female =1; Transgender was dummy-coded as male=0 and female=0.

**3. Results**

*3.1. Embarrassment and Fear*

Table 1. Total and gendered descriptive statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | Total | Male | Female | Transgender |
|  | Mean | SD | mean | SD | Mean | SD | Mean | SD |
| Adoption  | 3.39 | 0.60 | 3.42 | 0.59 | 3.36 | 0.60 | 3.85 | 0.40 |
| Risky sexual behaviour | 1.85 | 1.16 | 1.88 | 1.17 | 1.86 | 1.17 | 1.14 | 0.35 |
| Drug-taking | 1.10 | 0.42 | 1.14 | 0.53 | 1.07 | 0.35 | 1.09 | 0.43 |
| Fear  | 3.48 | 0.83 | 3.35 | 0.88 | 3.55 | 0.79 | 3.73 | 0.70 |
| Embarrassment  | 1.50 | 0.84 | 1.46 | 0.81 | 1.52 | 0.86 | 1.27 | 0.63 |

Table 2 Bivariate correlation

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1. adoption | 1.00 |  |  |  |  |  |  |  |  |
| 2. age | .12\*\*\* | 1.00 |  |  |  |  |  |  |  |
| 3. male | .04 | .22\*\*\* | 1.00 |  |  |  |  |  |  |
| 4. female | -.06\* | -.22\*\*\* | -.98\*\*\* | 1.00 |  |  |  |  |  |
| 5. risky sexual behaviour | -.16\*\*\* | -.07\*\* | .02 | .00 | 1.00 |  |  |  |  |
| 6. Drug-taking | -.05\* | -.02 | .08\*\*\* | -.08\*\*\* | .10\*\*\* | 1.00 |  |  |  |
| 8. fear | .14\*\*\* | -.02 | -.12\*\*\* | .11\*\*\* | .00 | -.05\* | .16\*\* | 1.00 |  |
| 9. embarrassment | -.27\*\*\* | -.12\*\*\* | -.04 | .04 | .05\* | -.01 | -.15\*\*\* | .01 | 1.00 |

\* *p* < .05; \*\* *p* < .01; \*\*\* *p* < .001.

A hierarchical multiple regression was conducted to test the effect of fear and embarrassment on PrEP adoption. In step one, age, gender (i.e. male and female), risky sexual behavior, and drug-taking were entered as control variables, and this explains 6.2% (*R2* adjusted) of variance in PrEP adoption, *F*(5, 1137) =15.10, *p* < .001. In Step Two, fear and embarrassment were entered and explained a significant additional 10.0% (*R2* adjusted) of variance in PrEP adoption, *F* change = (2, 1135) =67.94, *p* < .001. In the final model, fear and embarrassment and their interaction with male and female were entered, and explained a significant additional 1% (*R2* adjusted) of variance in PrEP adoption, *F* change = (4, 1131) = .27, *ns*. The final model explained 15.8% (*R2* adjusted) of variance in PrEP adoption, *F*(11, 1142) = 20.51, *p*< 0.001. Coefficients can be seen in Table 3. In the final model, variables of age, female, and risky sexual and drug-taking behavior, embarrassment significantly predicted PrEP adoption, the interaction between embarrassment and male was marginally significant. Fear was no longer significant when including the interaction variables in the model.

The results indicate that younger (vs. the older individuals) and female (vs. male and transgender) individuals were less likely to adopt PrEP. High risk behaviors (i.e. risky sexual and drug-taking behavior) reduced PrEP adoption. In line with Hypothesis 1 and 2, fear increases willingness to adopt PrEP while embarrassment reduces it. Supporting our predictions, we found no gender differences in the effect of fear on PrEP adoption. However, the effect of embarrassment is more pronounced for transgender and female compared with male individuals.

Table 3.

Summary of the hierarchical multiple regression analysis predicting adopting behaviour from fear and embarrassment among genders.

|  |  |
| --- | --- |
|  | Regression analyses (DV = Adoption) |
| Predicators:  |  | *t* |
| β |
| Step 1: |  |  |  |
|  | Age | .09 | 4.43\*\*\* |
|  | Male | -.52 | -2.48\* |
|  | Female | -.69 | -3.33\*\*\* |
|  | Risky sexual behaviour | -.14 | -4.58\*\*\* |
|  | Drug taking | -.07 | -2.48\*\* |
|  |  |  |  |
|  |  | ΔR2 = .062; ΔF (5, 1137) = 15.10 \*\*\* |
| Step 2: |  |  |  |
|  | Age | .07 | 23.57\*\*\* |
|  | Male | -.37 | -1.87 |
|  | Female | -.60 | -3.03\*\* |
|  | Risky sexual behaviour | -.09 | -3.82\*\*\* |
|  | Drug taking | -.06 | -2.16\* |
|  | Fear | .14 | 5.25\*\*\* |
|  | Embarrassment | -.28 | -10.38\*\*\* |
|  |  |  |  |
|  |  | ΔR2 = .100; ΔF (2, 1135) = 31.47 \*\*\* |
| Step 3: |  |  |  |
|  | Age | .07 | 3.64\*\*\* |
|  | Male | -.30 | -1.36 |
|  | Female | -.52 | -2.40\* |
|  | Risky sexual behaviour | -.09 | -3.71\*\*\* |
|  | Drug taking | -.06 | -1.98\* |
|  | Fear | -.03 | -0.11 |
|  | Embarrassment | -.73 | -2.79\*\* |
|  | Fear \* male | .17 | 0.72 |
|  | Fear \* female | .16 | 0.66 |
|  | Embarrassment \* male | .51 | 1.90+ (*p = .058*) |
|  | Embarrassment \* female | .43 | 1.64 |
|  |  | ΔR2 = .004; ΔF (4, 1131) = .27 |

*Note.* Gender was coded by using two dummy variables – male and female. Male was coded as male =1 and female= 0; Female was coded as male=0 and female =1; Transgenders was coded as male=0 and female=0; β is the standardised regression coefficient*;* \* *p* < .05; \*\* *p* < .01; \*\*\* *p* < .001.

*3.2. Gender Differences*

To test if gender moderated the effect of embarrassment on PrEP adoption, a moderated mediation analysis with 5000 bootstrap iterations was conducted (Hayes, 2018; Model 10). We examined whether gender moderates the effect of embarrassment on information concealment, which in turn, affects PrEP adoption (Figure 2). While the direct effects indicate that embarrassment negatively predicts PrEP adoption across all genders, the effect of embarrassment is mediated by partner concealment for males and females (Table 4). The desire to conceal information on PrEP adoption from partners suggests that cisgenders could be avoiding social judgment. In other words, public embarrassment could be impeding PrEP adoption among cisgenders. Conversely, transgender individuals could be hindered by private embarrassment for information concealment did not mediate the effects of embarrassment on PrEP adoption (Table 4).

Figure 2 Tested model

Table 4

Moderated mediation analyses

| **Conditional effects of embarrassment on adoption**  | **Direct effect** | **Indirect effect via informing partners** |
| --- | --- | --- |
| **Effect** | **SE** | **t** | **Effect** | **SE** | **LLCI** | **ULCI** |
|  Transgenders | -.53 | .19 | -2.84\*\* | -.02 | .03 | -.05 | .08 |
|  Males | -.11 | .03 | -4.41\*\*\* | -.02 | .01 | -.04 | -.01 |
|  Females | -.18 | .02 | -9.34\*\*\* | -.03 | .01 | -.05 | -.02 |

Note. N =1797. SE = standard error, LLCI = lower limit for confidence interval, ULCI = upper limit for confidence interval. Gender was coded by using two dummy variables – male and female. Male was coded as male =1 and female= 0; Female was coded as male=0 and female =1; Transgender was coded as male=0 and female=0; \* *p* < .05; \*\* *p* < .01; \*\*\* *p* < .001.

**4. Discussion**

*4.1. Conclusion and Implications*

Despite being purported as a means to ending the HIV epidemic, the PrEP drug has yet to be widely adopted. This begets the question: How can we encourage PrEP adoption, especially among high-risk individuals? Our study addresses this issue by examining how emotions affect PrEP adoption in eight countries with high HIV prevalence. In line with our hypotheses, fear increases willingness to adopt PrEP while embarrassment decreases it. Interestingly, our study also reveals significant gender differences. Specifically, transgender and female individuals were more affected by embarrassment, compared to their male counterparts. Moreover, decreased PrEP adoption was driven by public embarrassment for cisgenders while transgender individuals were mostly driven by private embarrassment.

These insights not only broaden our understanding of how emotions influence preventive sexual behavior across genders, but also better inform the design of health communications. While fear could promote PrEP adoption, fear tactics often backfire amongst at-risk individuals who believe that they cannot avert the risk (Kok et al., 2018; Witte & Allen, 2000). Our research shows that these effects could be partly driven by embarrassment. Thus, it is imperative to provide remedies for embarrassment as it reduces PrEP adoption especially amongst transgender and female individuals. Furthermore, these remedies need to take into account that different forms of embarrassment impede PrEP adoption across genders. Accordingly, while personal and undisclosed modes of purchase could help cisgenders avoid public embarrassment, purchasing purposes that boost self-concept could assist transgender users in averting private embarrassment.

*4.2. Limitations and future research*

Our findings are subject to several limitations. First, the study relied on self-reports to measure emotions and sexual behavior. Given the taboo nature of sexual behavior, these reports might be subject to a degree of social desirability. Also, given the large-scale global data collection process, we do not have resources to adopt long scales for some measurement. Secondly, these relationships were demonstrated by theoretical inference and survey data. It is also possible that PrEP adoption induces fear and embarrassment. Thus, future research could adopt experimental methods to illustrate a causal relationship between these emotions and PrEP adoption, as well as examine if these effects could extrapolate to other HIV preventive behaviors. Thirdly, our findings were based on a small number of transgender individuals. Hence, examining the gender differences in embarrassment in a larger group of transgender individuals may merit future exploration.

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