



Pathways among masculinity, femininity, and health behaviors in emerging adulthood

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Published online: 27 May 2020

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Abstract

The Bem Sex Role Inventory (BSRI) is a widely-used measure of psychological masculinity, femininity, and androgyny (Bem in *Journal of Consulting and Clinical Psychology*, 54, 196–205, 1977). Psychological androgyny is correlated with a host of positive outcomes, including self-esteem (Buckley and Carter in *Sex Roles*, 53, 647–661, 2005) and social adjustment (Markstrom-Adams in *Sex Roles*, 21, 325–340, 1989). However, little work has explored how gender role orientation relates to overall and risky health behaviors in college students. This study was designed to examine the potential pathways among gender role orientation, adaptability, and health behaviors in a sample of emerging adults. The sample included 199 students (mean age = 19.7 years) recruited from a mid-sized regional university in the Southwest U.S. Participants completed an online survey that included measures of gender role orientation, adaptability, physical health, and risky health behaviors. Quantitative analyses revealed that higher levels of masculinity and femininity predicted more positive health behaviors among both college men and women. Implications for emerging adult populations are discussed.

Keywords Gender · Emerging adulthood · Health behaviors · Masculinity · Femininity

Emerging adulthood (18–25 years of age) is characterized by identity exploration (Juang and Syed 2010), instability, and “feeling in-between” (Arnett 2000; 2015). The university setting represents an ideal opportunity for identity exploration, as students can change majors and career goals, try various courses, and explore different world views (Brock 2010; McAdams and Guo 2014). Traditional college students, a subpopulation of emerging adults (Arnett 2015), experience new developmental challenges such as moving away from home and adjusting to the demands of college coursework (Dill and Henley 1998; Towbes and Cohen 1996). For some students, these changes may be stressful (e.g., American College Health Association 2014; Brougham et al. 2009; Turner and Lloyd 2004; Wilbum and Smith 2005) and may adversely affect health and risk-taking behaviors (Bowers and Segrin 2017). Indeed, emerging adults who enroll in higher education

experience particularly heightened levels of stress compared to their same-age peers who are not in college (Peer et al. 2015), and are more likely to seek out novel situations and engage in risky behaviors. The college student subpopulation of adults is also less likely to engage in positive health behaviors than their peers (Blimling 2013; Kooyman et al. 2011). Several studies have shown gender differences in health and risk behaviors within college populations (Korn and Bonny-Noach 2018; West et al. 1996); however, these studies have shown little attention to within-gender differences (e.g., the effects of individual gender role orientation). Thus, our study sought to examine how gender role orientation influences health and risk behaviors among college students.

Emerging adulthood scholars explain that the increase in risk taking and poor health behaviors during this developmental period are the result of both unique environmental (e.g., new peer groups; Gardner and Steinberg 2005) and biological (e.g., brain development, specifically limited frontal lobe functioning factors; Eshel et al. 2007; Pharo et al. 2011) factors. Emerging adults who move to college are often in search of connectedness with others in a new environment, which can increase the pressure to engage in risky behaviors (Kooyman et al. 2011). In fact, health-risk behaviors such as binge drinking are higher among emerging adults than they are at any other point in the lifespan (Arnett 2000, 2005;

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Bachman et al. 1996; Schulenberg and Zarrett 2006). Behaviors such as alcohol abuse and risky sexual encounters can lead to lowered self-esteem as well as negative consequences for physical health and well-being (Pompeo 2014; Kooyman et al. 2011). Because college students are introduced to a combination of health-related risks (e.g., “all-you-can-eat” dining facilities, widely available alcohol), and newfound autonomy, the university setting provides a platform for students to adopt health behavior patterns that have important repercussions for their future.

Gender Roles and Well-Being in College Students

Gender role orientation in the present study is operationalized using the Bem Sex Role Inventory (BSRI) and reflects an individual’s identification with traditionally masculine and feminine personality characteristics (Bem 1974). Those who identify strongly with both masculine/instrumental and feminine/expressive traits are characterized by Bem as having an androgynous gender role orientation (1974). College students’ scores on the Bem Sex Role Inventory have remained relatively consistent across the past four decades, with a few significant exceptions. First, college women in the U.S. have increased their endorsement of masculine traits (Donnelly and Twenge 2017). Between the 1970s and 1990s, women’s endorsement of masculine traits increased, and endorsement of feminine traits remained stable. The change in women’s trait endorsement may be due, in part, to a cultural shift. That is, as the number of women enrolling in higher education and entering the U.S. workforce has increased, women have learned to successfully navigate an androcentric culture (Donnelly and Twenge 2017). On the other hand, college students’ BSRI-measured psychological androgyny scores have remained relatively consistent across time. Additionally, overall endorsement of masculinity and femininity scores in the BSRI have shown a slight decline since the 1990s for both men and women. Perhaps college students are less likely to endorse traits that are strongly and stereotypically gendered, either masculine and feminine (Donnelly and Twenge 2017).

Among adults, gender role orientation and the expression of traditionally-gendered traits have been shown to predict physical health and well-being (Scott et al. 2015), as well as a host of self-reported health indicators that are especially relevant to the period of emerging adulthood (Shifren and Bauserman 1996). Bem (1974) hypothesized that androgynous individuals, regardless of their biological sex, can exhibit instrumental (masculine) or expressive (feminine) traits depending on the situation. Additionally, this interpersonal flexibility implied from androgyny is hypothesized to be an adaptive trait that could lead to a host of psychological and physical benefits (Bem 1977; Downing 1979). Psychological

androgyny is associated with having better mental health (Lefkowitz and Zeldow 2006), superior health habits and practices (e.g., Brems and Johnson 1990; Shifren and Bauserman 1996; Shifren et al. 2003), higher levels of self-esteem in conjunction with lower levels of depressive symptoms (Io et al. 2019; Juster et al. 2016), higher self-efficacy (career: Bolat and Odacı 2016) and greater life satisfaction (Matud et al. 2014). Given the evidence of gender differences in health and risk behaviors within college populations (Korn and Bonny-Noach 2018; West et al. 1996), it is important to consider whether gender role orientation might interact with gender to explain health and risk behaviors. For example, in a study conducted by Yarnell et al. (2019), the authors found that androgyny, as measured by the BSRI, predicted self-compassion for women but not men, illustrating gender-differentiated psychological benefits of the trait.

Among college students, psychological androgyny is related to more help-seeking behavior (Marrs et al. 2012) and lower levels of perceived stress (Jones et al. 2016) than more stereotyped gender role orientations. Further, it is theorized that individuals who dually endorse masculine and feminine traits have a more realistic perception of their own health compared to non-androgynous individuals (Shifren and Bauserman 1996). However, there has yet to be a study to empirically test relations among androgyny, adaptability and health behaviors. Thus, the body of research on androgyny points to many psychological benefits of the trait, while leaving open the under-studied possibility that it may confer physical and behavioral health benefits as well.

While some work suggests a clear-cut advantage for individuals who rate themselves high in androgyny, other evidence suggests a need to examine the unique contributions of masculinity and femininity on health and risk-taking outcomes. For example, in a recent study with older adults, researchers found that those with feminine gender role orientation are at a higher risk of poor physical health outcomes compared to androgynous individuals. They also found that high levels of masculinity (but not femininity or androgyny) predicts positive physical health (Ahmed et al. 2018). Similar to the androgynous gender role orientation, scoring high in typically-masculine traits is associated with greater psychological well-being among adults (Saunders and Kashubeck-West 2006), lower rates of depression (Priess et al. 2009; Szpitalak and Prochwicz 2013), and better health-promoting behaviors (Shifren et al. 2018). Although these findings could imply that the positive effects of androgyny on health outcomes are driven by masculinity (Taylor and Hall 1982), there is mixed evidence that masculinity drives this effect for risk-taking behavior. Some studies show that masculinity is related to increased risk-taking behavior, such as reckless driving and drug use (Danoff-Burg et al. 2006; Zimmermann et al. 2011). For example, Peralta et al. (2010) showed that after controlling for respondent sex, masculinity is a strong predictor for binge

drinking among college students. In direct contrast, other studies show that masculinity does not influence risk-taking behaviors such as alcohol consumption (Barrett and White 2002; Huselid and Cooper 1992).

Researchers posit that femininity is inherently related to some health behaviors, such as seeking help and avoiding risky situations (Mahalik et al. 2007). However, there is considerably less empirical work examining the relationship between feminine gender role orientation and health outcomes. Among men, femininity contributes to health-promoting behaviors (Shifren and Bauserman 1996; Spaderna and Sieverding 2014), and protects against health-risk behaviors such as alcohol consumption (Zimmermann et al. 2011). Further, the role of femininity on adjustment for women specifically is less clear: the feminine gender role orientation is related to both positive outcomes among women, such as positive adjustment (Littlefield 2003) and negative outcomes, such as alcohol use (in Toronto: Van Gundy et al. 2005). Some research shows that femininity, but not masculinity, is associated with mental health advantages for both men and women (Gibson et al. 2016). Other evidence suggests no relationship between femininity and health behavior (Hunt 2002). Given the inconsistent pattern of this research, the nature of the relationship between the feminine role orientation and health or risk-taking outcomes is not fully understood.

Exploring the Internal and External Validity of the BSRI

In choosing the BSRI as our measurement of psychological androgyny, we did so with awareness of and attention to the criticisms of its validity. Regarding internal validity, the BSRI has received criticism of some of the items representing the underlying constructs (Hoffman and Borders 2001) and of the response format of the BSRI. However, the BSRI short form has proven to be more psychometrically sound and valid than the long form (Campbell et al. 1997; Colley et al. 2009). The BSRI is still commonly used in recent empirical work (Buckley 2018; Jonason and Davis 2018). For these reasons, we chose to use the short form of the scale, while also conducting principal components analysis to validate the structure of the items mapping onto masculinity and femininity.

With regard to the predictive validity of the BSRI, there is some concern that androgyny has been shown to inconsistently predict positive psychological and health outcomes (Aube et al. 1995; Ruffing-Rahal et al. 1998; Spence and Hall 1996; Whitley 1983). Bem (1974) hypothesized that because androgynous individuals integrate both masculine and feminine personality characteristics, they are more adaptable and thus should have more positive outcomes. However, little attention has been given to whether (a) androgyny is related to

adaptability and (b) adaptability relates to positive outcomes. Although Bem (1974) thought that adaptability was inherent to the construct of androgyny, the evidence reviewed above indicates the need to consider whether adaptability is related independently to masculinity and femininity. Indeed, other gender role orientations, like masculinity and femininity may be also predictive of adaptability. We hoped that by examining these assumed links, we would better understand if androgyny confers physical and behavioral health benefits.

Purpose of the Study

The period of emerging adulthood, especially among the subset of emerging adults enrolled in college, provides an ideal opportunity to test the possible benefits of adaptability for a range of health and risk behaviors (Pharo et al. 2011). In the present study, we examined the relationship between gender role orientation and health/risk-taking behaviors among emerging adults to determine whether the relationship between an individual's levels of psychological androgyny and health outcomes would be replicated in emerging adulthood, a time in the lifespan during which individuals are at a heightened level (compared to their earlier years) of morbidity and mortality despite generally good physical health (Arnett 1992; Dahl 2004; Pharo et al. 2011). That is, we wanted to know: is androgyny, and the resulting flexibility that is theorized to accompany it, a protective factor against negative health and behavioral outcomes for emerging adults, particularly those in college and university settings?

We addressed the following specific research questions in our study:

- 1) Are there gender differences in levels of psychological masculinity and femininity?

Based on prior research (e.g., Gibson et al. 2016; Lin and Billingham 2014), we expected men to have higher masculinity scores than women and women to have higher femininity scores than men in our sample.

- 2) Does an individual's gender role orientation predict key health outcomes, including overall health and risky behaviors?

We expected that participants with a more androgynous role orientation would report better overall health and lower risk-taking behavior than those with a less androgynous role orientation. Additionally, we predicted that adaptability would be related to androgyny, overall health, and risk-taking behaviors. We expected that individuals with greater masculine role orientation would report better overall health and more risk-taking behaviors than those with lower ratings on masculine

traits. Given the equivocal nature of the literature, we make no a priori hypotheses regarding the relationship between feminine role orientation and overall health and risky behaviors.

3) Do the pathways among these variables differ for emerging adult women and men?

We hypothesized that relations among psychological androgyny, adaptability and overall health/risk-taking would be similar for men and women. Due to conflicting reports (e.g., Daigle and Mummert 2014; Gibson et al. 2016), we were unable to formulate a hypothesis concerning whether masculine and feminine gender role orientations relate to male and female college students' overall health and risk-taking behavior in the same way.

Method

Participants

Participants included 199 college students (110 female, 89 male) attending a regional university in the Southwest United States. The students ranged in age from 18 to 25 years ($M = 19.7$, $SD = 1.91$), and the sample was 64.3% white, 14.1% Latinx, 8% African American, and 7% Asian American (6.5% of the sample did not specify a race/ethnicity). More than one-half of the participants were underclassmen (freshmen and sophomore classification; $n = 137$). The sample of students was recruited from a variety of major courses across the university. Students were recruited in two ways: undergraduate psychology students were recruited through a research participation requirement in their introductory psychology courses. Students from majors outside of psychology were recruited from individual classes, with faculty in these classes offering participation as one of several ways of obtaining extra credit in the course.

Procedure and Measures

Students who agreed to participate were sent a link to an online survey. Participants took an average of 20.6 minutes to complete the survey.

Psychological Masculinity and Femininity Participants' levels of psychological masculinity and femininity were measured using the short-form version of the Bem Sex Role Inventory (BSRI-SF; Bem 1981). Overall, the BSRI is both a reliable and valid measure of psychological masculinity and femininity (Brems and Johnson 1990; Donghyuck and Kashubeck-West 2015; Hoffman and Borders 2001). The original measure presents a set of 20 items (10 masculine/instrumental, 10 feminine/expressive) for which respondents use a seven-point

scale to indicate how much they identify with each trait (1 = "Almost never true for me" to 7 = "Almost always true for me."). Masculine trait scores in our sample ranged from 2.44 to 7.0 ($M = 5.04$, $SD = 1.02$); feminine trait scores ranged from 2.89 to 7.0 ($M = 5.86$, $SD = .95$); androgyny scores ranged from 6.22 to 14.0 ($M = 10.91$, $SD = 1.46$). Feminine and masculine trait scores were not significantly correlated ($r = .13$).

We performed two sets of exploratory factor analyses (principal components) with items for the masculinity and femininity scales. Two factor loadings appeared on the masculinity scale, with one item ("defends own beliefs") loading separately from the other 9 items (.31). Similarly, one item on the femininity scale loaded separately ("affectionate") from the other 9 items (.14). All other items on both scales loaded at least .50 onto the factor. We excluded the two separately loading items ("defends own beliefs" and "affectionate") when calculating the masculinity, femininity and androgyny scales for our analyses. Participants' scale scores were computed by calculating their average scores on the masculinity and femininity items, and an overall androgyny score was computed by adding together the femininity and masculinity scale scores ($\alpha = .86$; as suggested by Bem 1977).

Adaptability We could find no existing measure of psychological adaptability that directly captured the domain-general adaptability construct that we proposed should link androgyny and behavioral outcomes. There are several existing measures that capture flexibility or adaptability in a more domain-specific manner, including interpersonal flexibility (Paulhus and Martin 1988) and behavioral adaptation in specific situations (Diefendorff et al. 2000). Thus, we created three face valid items to measure participants' situational adaptability and flexibility. Participants rated their agreement on a scale of 1 to 5 for the following items: "I am someone who adjusts easily to new situations"; "I usually have a hard time adapting to new environments; [reverse scored]" and, "I feel like I am a flexible person in general." Chronbach's alpha for the scale was .78. Total scores ranged from 1.0 to 5.0 ($M = 3.38$, $SD = .90$).

Additionally, to show evidence of convergent and divergent construct validity, we examined the correlations between participants' responses to our newly created adaptability scale and scores on two of the dimensions of the Big Five Inventory (BFI; John et al. 2008). As predicted, we found that adaptability was positively correlated with the trait of openness ($r = .18$, $p < .009$), and negatively correlated with the trait of neuroticism ($r = -.48$, $p < .001$).

Health Indicators The RAND 36-item Short Form Health Survey (SF-36) is a 36-item measure containing eight subscales: physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, pain, general well-being, social functioning, and

general health (Hays et al. 1993). This measure was chosen because it has been used with college students (Sharkey et al. 2017) and has been used to investigate the relationship between BSRI traits and health-related outcomes (Gale-Ross et al. 2009). For our study, one SF-36 subscale was used. The *general health perceptions subscale* contained four items that measured participant's perceptions of their overall health and well-being. Participants were asked to rate how true a set of statements about their health were (e.g., "My health is excellent", "I seem to get sick easier than other people.") on a scale from 1 (not at all/definitely true) to 5 (extremely/definitely false). Total scores were calculated by averaging across participants' responses on these four items, with the scores on the positive health items reversed, so that a score of 5 indicated that the negative health statements were very untrue of them. Cronbach's alpha for the scale was .74. Total scores ranged from 1.0 to 4.67 ($M = 2.93$, $SD = .66$).

Risky Health Behaviors Risky health behaviors were measured using a subset of items from the Centers for Disease Control Youth Risk Behavior Surveillance System (YRBSS; 2014). These six items asked about cigarette usage, alcohol usage, drug usage, and sexual behavior (unprotected sex). Participants answered how often, if ever, they engaged in these risky behaviors. We created a composite general risky behavior score that averaged across responses to these six items, so that higher scores indicated a higher frequency of risky health behaviors ($\alpha = .67$). Total risk-taking behavior scores ranged from .80 to 5.60 ($M = 2.01$, $SD = .90$). Additionally, we averaged across two items to create an alcohol consumption ($\alpha = .76$) scale.

Results

Descriptive Analyses

We began by examining gender differences in our primary variables through a series of independent samples *t*-tests (See Table 1 for complete results). On the BSRI, women scored significantly higher than men on femininity ($p < .05$). However, there were no gender differences in scores of masculinity or androgyny ($p > .05$). Men reported higher levels of adaptability compared to women ($p < .05$). There were no gender differences in overall risk-taking behavior, though men did report significantly higher rates of alcohol consumption compared to women ($p < .05$). Women had significantly higher perceptions of their overall health than did men ($p < .001$).

Correlations among predictor variables were run separately for men and women (Table 2). Androgyny and adaptability were correlated as hypothesized for men, but not for women. When we examined the correlates of men's masculinity and

Table 1 Gender differences in primary variables

	<i>M</i> (<i>SD</i>)		<i>t</i>	<i>d</i>
	Women	Men		
Masculinity	5.00 (.92)	5.10 (1.14)	.689	–
Femininity	5.99 (0.94)	5.70 (0.96)	–2.15*	0.30
Androgyny	10.97 (1.33)	10.83 (1.99)	–.683	–
Adaptability	3.27 (0.91)	3.54 (0.86)	2.07*	0.30
Risky Behavior	1.96 (0.85)	2.07 (0.97)	0.819	–
Drinking Behavior	1.72 (1.23)	2.15 (1.64)	2.12*	0.29
General Health	3.08 (0.60)	2.74 (0.68)	–3.70***	0.53

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

femininity separately, both traits were positively correlated with scores on the adaptability measure. For men, psychological androgyny and masculinity were correlated with risk-taking behaviors. Interestingly, for men, adaptability was not significantly related to any of our outcome variables. Within our sample of college women, most of the intercorrelations were relatively small.

Relationships with Physical and Behavioral Health

Initially, we hypothesized that the relationship among our primary variables would operate similarly for men and women. However, correlation analyses of the links between these variables showed this assumption to be untrue, even though we found similar levels of these traits among the women and men in our college student sample, aside from femininity. To examine how gender role orientation relates to adaptability on health outcomes, and how gender influences the strength of this relationship, we used PROCESS Model 8 (Hayes 2013). Model 8 (Figs. 1 and 2) is a model of moderated mediation that uses bootstrapping and 95% bias-corrected confidence intervals to assess the significance of indirect effects (Preacher et al. 2007). When we performed the analyses, we bootstrapped our sample to 1000 resamples and used mean-centered variables (Preacher et al. 2007). All continuous variables were mean centered to reduce multicollinearity (Cohen et al. 2003). The estimated effects reported were unstandardized regression coefficients (Tables 3, 4 and 5).

Moderated Mediation for General Health Perceptions

To examine the pathways among gender role orientation (GRO), adaptability and general health perceptions, three moderated mediations were examined.

Androgyny In a model examining androgyny as the predictor, adaptability as the mediator and perceptions of health as the

Table 2 Correlation matrix for preliminary analyses

	1.	2.	3.	4.	5.	6.	7.
1. Femininity	–	.02	.76***	–.03	–.14	–.152	–.243
2. Masculinity	.26*	–	.65***	–.134	.06	.13	.14
3. Androgyny	.75***	.83***	–	–.17	–.12	–.04	–.10
4. Adaptability	.24*	.33**	.35***	–	.29**	.17	.15
5. Overall Health	–.06	–.06	–.12	–.16	–	–.08	–.12
6. Risk-taking	.04	.22*	.20*	–.09	.18	–	.79***
7. Drinking	.09	.16	.207	–.004	.08	.874***	–

Coefficients above the diagonal are for women, and coefficients below the diagonal are for men. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

outcome, a significant path A, $F(3, 187) = 5.65, p = .001, R^2 = .083$, indicated for men, androgyny predicted adaptability [$b = 0.17, p < .001; 95\% \text{ CI} = [.0666 \text{ to } .2911]$]. Path B was also significant, $F(4, 186) = 8.81, p < .001, R^2 = .16$, and revealed that adaptability and gender significantly predicted general health perceptions. Androgyny was a moderately significant predictor ($p = .09$). However, the interaction between gender and androgyny was not significant. There was a significant index of moderated mediation (Index = .051, 95% CI = [.0178 to .1004]). For men, there was a significant indirect effect of the overall model ($\beta = -.03, 95\% \text{ CI} = [-.0646 \text{ to } -.0117]$).

Masculinity The same procedure was used to test a mediation effect of masculinity. A significant path A $F(3, 189) = 5.16, p = .001, R^2 = .075$, revealed that for men, masculinity predicted adaptability ($b = .24, p < .002; 95\% \text{ CI} = [.0857 \text{ to } .4090]$). Path B was also significant, $F(4, 189) = 7.16, p < .001, R^2 = .13$. Unlike in our first model, masculinity was not a significant predictor in this model. However, adaptability and gender both significantly predicted general health perceptions. The interaction between gender and masculinity was not

significant. Again, there was a significant index of moderated mediation (Index = .05, 95% CI = [.0129 to .1298]). These results suggest that adaptability mediates the relationship between masculinity and perceived health for men ($b = -.56, 95\% \text{ CI} = [-.07 \text{ to } -.01]$).

Femininity Next, we examined whether adaptability mediated the relationship between femininity and self-perceptions of health. Path A of the mediation model was significant, $F(3, 187) = 3.13, p = .02, R^2 = .047$. Gender was a significant predictor of adaptability. Femininity was not significant in this equation, but the interaction of gender and femininity was significant for men ($b = .21, p = .03, 95\% \text{ CI} = [.0132 \text{ to } .4071]$). Path B was also significant, $F(4, 186) = 8.747, p < .001, R^2 = .15$. Similarly to masculinity, femininity was not a significant predictor in this pathway. However, adaptability and participant gender both significantly predicted general health perceptions. The interaction between gender and femininity was not significant. There was not a significant index of moderated mediation (Index = .04, 95% CI = [-.008 to .10]), suggesting that there was not a complete moderated mediation. However, the lack of significance in the direct

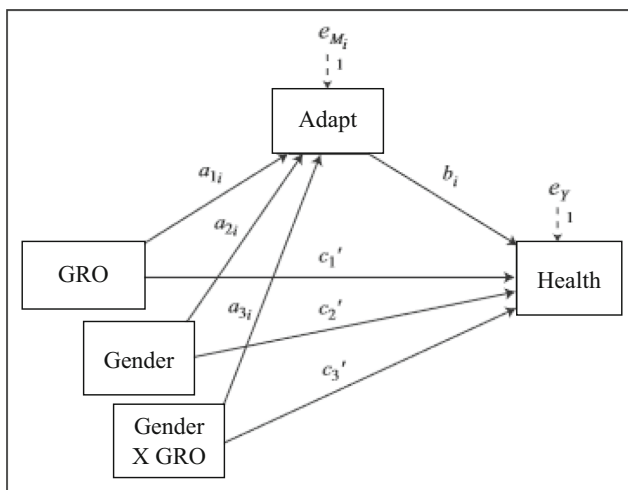


Fig. 1 Statistical diagram of moderated mediation model with perceived health as the outcome

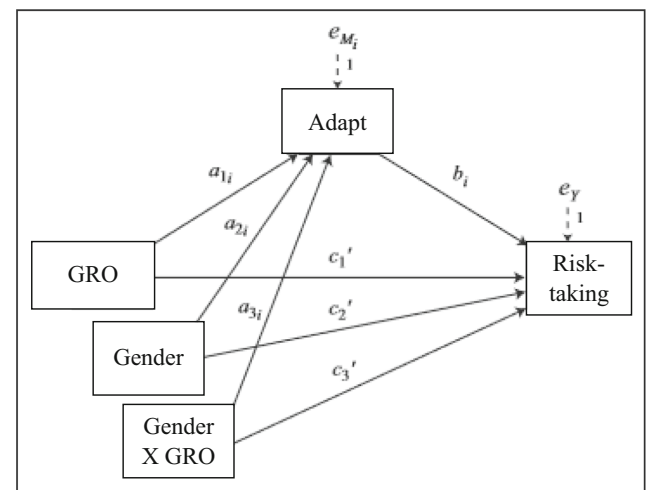


Fig. 2 Statistical diagram of moderated mediation model with risk-taking as the outcome

Table 3 Tests of moderated mediations

Model Tested	<i>a</i> ₁	<i>a</i> ₂	<i>a</i> ₃	<i>b</i>	<i>c</i> ₁ '	<i>c</i> ₂ '	<i>c</i> ₃ '
Androgyny → Adaptability → Perceived Health <i>Gender as a moderator</i>	0.03(.04)	-0.27 (.12)*	-0.26(.08)***	-0.19(.05)***	-0.04(.02)	0.29(.08)***	-0.01 (0.05)
Masculinity → Adaptability → Perceived Health <i>Gender as a moderator</i>	0.03(.06)	-0.24(.12)*	-0.38**	-0.15 (.05)**	-0.001 (.04)	0.34(.09)***	0.05(.08)
Femininity → Adaptability → Perceived Health <i>Gender as a moderator</i>	0.08(.06)	-0.32(.13)**	-0.22(.13)	-0.20(.04)***	-0.06(.04)	0.30(.08)***	0.20(.21)
Androgyny → Adaptability → Risk-taking <i>Gender as a moderator</i>	0.02(.04)	-0.31(.12)*	-0.27(.08)***	0.05(.12)	0.17(.07)**	-0.01 (.21)	0.06(.14)
Masculinity → Adaptability → Risk-taking <i>Gender as a moderator</i>	0.03(.06)	-0.26(.12)*	-0.38(.12)**	0.02(.12)	0.29(.10)**	0.01(.21)	-.23(.20)
Femininity → Adaptability → Risk-taking <i>Gender as a moderator</i>	0.07(.06)	-0.33(.13)*	-0.24(.13)	0.07(.12)	0.03(.11)	0.07(.21)	0.02(.21)

Regression coefficients with standard error in parentheses. Gender was coded dichotomously (0 = girl, 1 = boy). * *p* ≤ .05 ** *p* ≤ .01 *** *p* ≤ .001

effect (*b* = -.03, *p* > .05), combined with a significant indirect effect of the overall model for men *b* = -.04, 95% CI = [-.0915 to -.0086]), suggests a partial mediation. That is, adaptability partially mediated the relationship between femininity and perceived health for men.

Moderated Mediation for Risk-Taking Behavior

To examine the pathways among gender role orientation, adaptability and risk-taking behaviors, three moderated mediation models were examined.

Androgyny Results from a model examining androgyny as the predictor, adaptability as the mediator and general risk-taking

behavior as the outcome revealed a significant path A, *F* (3, 188) = 5.89, *p* < .001, *R*² = .086. This suggests that androgyny significantly predicts adaptability for men (*b* = 0.17, *p* = .002; 95% CI = [.0656 to .2922]). Unlike our models predicting health perceptions, path B was not significant, *F* (4,187) = 1.49, *p* = .20, *R*² = .033. There was a moderately significant direct effect of androgyny on risk-taking for women, (*b* = .42, *p* = .05). However, we did not find a significant complete or partial mediation, as indicated by the non-significant indirect effects and non-significant index of moderated mediation.

Masculinity In a similar model with masculinity as the predictor, Path A was significant, *F* (3, 191) = 5.19, *p* < .001, *R*² = .075, and indicated that for men, masculinity predicts

Table 4 Conditional direct effects at levels of the moderator

Model Tested	Direct Effect	BootSE	BootLLCI	BootULCI
<i>Androgyny</i> → <i>Adaptability</i> → <i>Perceived Health</i>				
Men	-0.04	0.03	-0.1209	0.0367
Women	-0.05	0.05	-0.1385	0.0311
<i>Masculinity</i> → <i>Adaptability</i> → <i>Perceived Health</i>				
Men	-0.03	0.06	-0.1508	0.0867
Women	0.43	0.06	-0.1052	0.1511
<i>Femininity</i> → <i>Adaptability</i> → <i>Perceived Health</i>				
Men	-	-	-	-
Women	-0.03	0.06	-0.1644	0.1033
Women	-0.09	0.06	-0.2120	0.0276
<i>Androgyny</i> → <i>Adaptability</i> → <i>Risk-taking</i>				
Men	-	-	-	-
Men	0.13	0.09	-0.0057	0.3303
Women	0.19	0.11	0.0140	0.8229
<i>Masculinity</i> → <i>Adaptability</i> → <i>Risk-taking</i>				
Men	-	-	-	-
Men	0.32	0.13	0.0523	0.5964
Women	0.27	0.14	-0.0182	0.5689
<i>Femininity</i> → <i>Adaptability</i> → <i>Risk-taking</i>				
Men	-	-	-	-
Men	-0.03	0.16	-0.3714	0.2932
Women	0.09	0.15	-0.1976	0.3945

Table 5 Condition indirect effects at levels of the moderator

Model Tested	Indirect Effect	BootSE	BootLLCI	BootULCI
<i>Androgyny</i> → <i>Adaptability</i> → <i>Perceived Health</i>				
Men	−0.03	0.01	−0.0646	−0.0117
Women	0.01	0.02	−0.0087	0.0483
<i>Masculinity</i> → <i>Adaptability</i> → <i>Perceived Health</i>				
Men	−0.03	0.01	−0.0797	−0.0109
Women	0.02	0.02	−0.0101	0.0666
<i>Femininity</i> → <i>Adaptability</i> → <i>Perceived Health</i>				
Men	−0.04	0.02	−0.0915	−0.0086
Women	0.002	0.01	−0.0370	0.0411
<i>Androgyny</i> → <i>Adaptability</i> → <i>Risk-taking</i>				
Men	0.009	0.02	−0.0303	0.0531
Women	−0.004	0.01	−0.0408	0.0186
<i>Masculinity</i> → <i>Adaptability</i> → <i>Risk-taking</i>				
Men	0.03	0.02	−0.0563	0.0686
Women	−0.001	0.01	−0.0507	0.0322
<i>Femininity</i> → <i>Adaptability</i> → <i>Risk-taking</i>				
Men	0.01	0.02	−0.0288	0.0696
Women	−0.002	0.01	−0.0351	0.0193

risk-taking behavior ($b = 0.24, p = .003$). Unlike our model predicting risk-taking behavior with androgyny, there was a significant path B, $F(4, 190) = 2.33, p = .05, R^2 = .04$. Masculinity was the only significant predictor of risk-taking behavior in this path. There was a direct effect of masculinity on risk-taking behavior for men, ($b = 0.32, p = .01$). However, we did not find a significant complete or partial mediation, as indicated by the non-significant indirect effects and non-significant index of moderated mediation.

Femininity Finally, we examined the pathways between femininity, adaptability and risk-taking behavior. A significant path A, $F(3, 188) = 3.13, p = .02, R^2 = .05$, revealed that gender was a significant predictor of adaptability ($b = -.33, p = .01$). Path B was not significant, $F(4, 187) = .19, p = .94, R^2 = .004$. There was not a direct effect of femininity on risk-taking behavior, or an indirect effect or a significant index of moderated mediation.

Discussion

The primary purpose of this study was to examine the pathways among gender role orientation and health and behavior outcomes, as well as the potential underlying mechanisms, among college women and men. Results from our study showed that the pathways between psychological gender role orientation, adaptability, perceived overall health/ risk-taking behaviors differed between men and women in our sample of

emerging adults. Specifically, we found that adaptability, as measured by a new set of items developed for our study, mediated the relationship between androgyny and general health perceptions for men in the target age group. Adaptability also mediated the link between men's trait masculinity and general health perceptions. Although our adaptability measure did not mediate the relationships between gender role orientation and risk-taking behavior, gender role orientation interacted with gender in predicting risk-taking behavior in our sample of college men and women.

Bem (1974) hypothesized that, because androgynous individuals integrate both masculine and feminine personality characteristics, they are more adaptable and thus should have more positive outcomes than individuals with more stereotyped trait endorsements. Novel to the current literature, we empirically tested the link between androgyny and adaptability. Additionally, we examined whether masculinity and femininity independently related to adaptability. We found that, for men, both androgyny and trait masculinity were related to self-reported levels of adaptability. Indeed, our data showed that the instrumental (and traditionally masculine) traits from the BSRI were traits related to flexibility and adaptability in new situations, for men. One possible explanation for this link is that some of the instrumental traits, like independence and assertiveness, are generally associated with acceptance of risks associated with novel environments (Jones et al. 1978). Some of these traditionally masculine traits on the BSRI are linked to positive identity development more so than some of the traditionally feminine items on the scale, like warmth and affection (Orlofsky 1977; Waterman and Whitbourne 1982).

Results from our self-reported health models demonstrated that both gender and adaptability predict perceptions of general health. These findings shed light on an underlying assumption of Bem's (1974) theory, that adaptability is related to positive health outcomes. Notably, the effect of adaptability on perceived health is similar for men and women. We found that adaptability mediated the relationship between masculinity and perceived health, as well as the relationship between androgyny and perceived health for both men and women. While the perceived health moderated mediation models are very similar for masculinity and androgyny, we did find a slight variation in that androgyny was the only gender role orientation to predict health in the second path. While the effect of androgyny was only moderately significant, the results do suggest some nuanced differences between the masculinity and androgyny models.

The results of our general risk-taking moderated mediations differ from our perceived health model results. First, there were not any significant moderated mediation effects for our general risk-taking models. Unlike in our health models, adaptability was not predictive of general risk-taking behavior. We found that, independent of the effect

of adaptability, androgyny predicted lower risk-taking behaviors for women. Unlike the findings from our health models, masculinity was the only gender role orientation to predict risk-taking in the second path. Again, this finding highlights the ways that the masculinity and androgyny models differ from each other and speaks to the importance of disentangling the separate influences of masculine and feminine trait identity. Finally, we found that masculinity predicted more risk-taking behaviors for men, independent of the mechanism of adaptability. Indeed, androgyny and masculinity predict risk-taking behavior differently for college men and women.

One of the surprising findings of our study was that the adaptability measure predicted health behaviors, but not risk-taking behaviors, among college students. There are several possible explanations for the link between adaptability and one but not both of our behavioral outcome measures. First, it is possible that, among a sample of emerging adults that are specifically college students, there was not adequate variance in the risk taking behaviors that we measured in our sample. That is, college students in our sample reflected the characteristics of college students in the United States generally in their high rates of engaging in risky substance use and sexual behaviors. It is important that future researchers should engage a more sensitive measure of risk taking that includes an updated list of newly emerging risks, such as vaping and e-cigarette use, online sexual communication and behaviors, and risk behaviors that involve driving (e.g., texting and driving). Finally, because the link between adaptability and risk taking was weak but trending in the hypothesized direction, it is possible that we had inadequate power to detect the relationship.

One of the most important questions for future studies posed by our results is the different patterns of relationships among our primary variables for college women and men. Specifically, our main hypothesis that adaptability would mediate the relationship between androgyny and risk behaviors was supported for men, but not for women. We wondered: why does this path of personal traits not predict health and behaviors among college women? Much of the variance in women's health behaviors in college may be explained by factors completely unrelated to gender-typed personality traits. More so than women, men have socially stringent gender roles and tend to view masculinity and femininity in a polarizing manner (Bosson and Michniewicz 2013). Perhaps gender-typed personality traits are less related to adaptability and women's health because it is more socially acceptable for women to express both masculine and feminine personality traits. Based on prior work that shows endorsement of gender-typed personality traits vary according to the context (Mehta and Dementieva 2017), it is possible that the link between gender-typed personality traits and women's health perceptions is context-specific.

Limitations and Implications

Our study is not without limitations. First, our sample of emerging adults was restricted to currently-enrolled undergraduate students, which represents only one, self-selected portion of adults in this developmental period. Research has shown that, compared to non-college adults, individuals enrolled in college have a higher socioeconomic status, higher levels of risky health behaviors, and more flexible gender attitudes (Arnett 2000; Arnett and Tanner 2006; White et al. 2008). Future studies should look at the pathways among these variables in a broader, more representative sample of emerging adults to determine whether the impact on health outcomes replicates what we found in our college student sample.

Second, it is important that we address the methodological limitations in the present study. Our measure of risk-taking behavior is limited and does not account for other risky health behaviors prevalent among emerging adults, such as driving under the influence, vaping, or misuse of prescription drugs. Although prior work has shown that global, general self-report measures of health are valid and reliable indicators of health status (Jylha 2009), the general health measure used in this study is broad and does not capture specific health aspects. Given that we did not find strong relationships between gender-related personality traits and our health outcome variable for women, future work should investigate how BSRI traits influence women's domain-specific health behaviors.

Despite these limitations, the results from this study have important theoretical and practical implications. Our study further extends upon prior research by taking a nuanced approach to understanding how gender role orientation differentially relates to perceived health and risk-taking behavior, and how adaptability influences these pathways for college men and women. Theoretically, the present study shows partial support for Bem's (1974) theory that psychological androgyny is related to adaptability. Practically, our results show that gender role orientation is more useful in understanding health and risk-taking behaviors in college students than biological sex. Gender-related personality characteristics should be considered in university health promotion initiatives. Our study also highlights the importance of considering the dual influence of biological sex and gender-related personality traits on research outcomes. We intend to replicate and extend these findings in our future work, and further examine the correlates of this new measure of adaptability and how it predicts other important outcomes in the emerging adulthood period, including career outcomes and social relations.

Acknowledgements The researchers would like to thank the students who participated in this research for their time. A portion of this work was presented at the biennial Gender Development Research Conference in San Francisco, CA in 2016.

Compliance with Ethical Standards

The authors declare that they have no conflicts of interest. There were no sources of funding for this research.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institution and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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