

AN EXAMINATION OF THE RELATIONSHIP BETWEEN GENDER IDENTITY
AND HUMOR PREFERENCE

by

Sara Schaffer, BA

A thesis submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Master of Arts
with a Major in Psychological Research
December 2017

Committee Members:

Reiko Graham, Chair

Natalie Ceballos

Judith Easton

COPYRIGHT

by

Sara Schaffer

2017

FAIR USE AND AUTHOR'S PERMISSION STATEMENT

Fair Use

This work is protected by the Copyright Laws of the United States (Public Law 94-553, section 107). Consistent with fair use as defined in the Copyright Laws, brief quotations from this material are allowed with proper acknowledgement. Use of this material for financial gain without the author's express written permission is not allowed.

Duplication Permission

As the copyright holder of this work I, Sara Schaffer, authorize duplication of this work, in whole or in part, for educational or scholarly purposes only.

DEDICATION

To my family and love of my life John Herrera, for always being supportive and proud of every milestone in my life, no matter how small. Thank you all for being with me through the ups and the downs of my educational journey. I love you all and wouldn't be here without you.

ACKNOWLEDGEMENTS

The author acknowledges Dr. Ceballos for her cheery demeanor, positivity and patience in constructing and implementing this experiment. Dr. Easton for her time and knowledge in the evolutionary theories and findings in psychological research. It was wonderful meeting someone who loves what they do, and it was a pleasure working with you. Most importantly Dr. Graham, words cannot express how much you have helped me these past two years. I honestly do not think I would be graduated if it was not for you. I cannot begin to thank you enough for not giving up on me and helping me find the time and the sanity to achieve my goals and complete this study. Thank you again.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
ABSTRACT	xi
CHAPTER	
I. INTRODUCTION	1
II. LITERATURE REVIEW	4
Evolutionary Theory of Humor Production and Appreciation	6
Gender Roles; Masculinity, Femininity and Androgyny	12
Gender Identification and Humor	14
Study Rationale	17
III. RESEARCH DESIGN AND METHODS	21
Participants	21
Self-Report Measures	21
Statistical Analysis	23
IV. RESULTS	25
Descriptive Statistics	25
Mediation Models	28
Independent <i>t</i> -tests and regressions	29
V. DISCUSSION	31

APPENDIX SECTION.....	47
LITERATURE CITED.....	51

LIST OF TABLES

Table	Page
1. Demographic Information for all Participants	25
2. Demographic Information for Participants recruited via SONA	26
3. Demographic Information for Participants recruited via Facebook	27

LIST OF FIGURES

Figure	Page
1. Mediation Model 1: Bem Scores as a Mediator of the Relationship Between Biological Sex and the Importance of Humor Production.....	28
2. Mediation Model 2: Bem Scores as a Mediator of the Relationship Between Biological Sex and the Important of Humor Appreciation.....	29

LIST OF ABBREVIATIONS

Abbreviation	Description
BSRI	Bem- Sex Role Inventory
LL	Lower Limit
UL	Upper Limit

ABSTRACT

Studies examining sex differences in humor appreciation and production have found that men tend to desire a partner who laughs at their jokes, while women prefer a partner who makes them laugh (Bressler, Martin, & Balshine, 2006). Miller (2000) suggests that these humor preferences have both evolved via sexual selection, such that humor production is a marker for genetic quality in men, and receptivity towards humor is a sign of sexual interest in women. However, less is known about how factors such as androgyny affect humor preferences. This study examined the effects of biological sex and gender identity on humor production and receptivity using The Bem-Sex Role Inventory (BSRI; Bem, 1974). Participants scoring as more masculine were hypothesized to show a higher preference for receptivity of humor in potential mates, while those higher in feminine qualities were predicted to show greater preference for humor production. Results revealed that individual Bem scores were not associated with importance of humor production or appreciation, indicating that a relationship between gender identity and humor preferences may not exist. Biological sex was found to be significantly related to humor preference in that women were shown to value both the production and receptivity of humor more so than males, suggesting that the way men and women value and use humor may be changing.

I. INTRODUCTION

Humor is a vital part of the human experience, serving a multitude of social, cognitive and emotional functions (Martin, 2007). Its frequency of use in social interactions and importance in everyday human behavior has resulted in the development of a number of theories to explain this fundamental social phenomenon. From a Darwinian perspective, humor is an indicator of creativity, a marker of intelligence and mental fitness that males use to display their suitability as a potential mate and attract the opposite sex (Miller, 2000). Previous studies on mate selection have shown that both men and women prefer someone with a “good sense of humor” (Buss & Barnes, 1986); however, their interpretations on what constitutes as a good sense of humor seem to differ (Bressler, Martin, & Balshine, 2006). Men have been shown to be attracted to women who laugh at their jokes, whereas women prefer a man that makes them laugh (Bressler et al., 2006). These sex differences in preferences for humor production and appreciation are based on the theory that humor is an indicator of a creative mind, which has been linked to better problem-solving abilities, increasing chances of survival and reproduction opportunities (Miller, 2000).

According to this theory (Miller, 2000), when men produce humor they are signaling to women that they possess a creative intellect. A women’s laughter in response to humor production is thought to be due to runaway sexual selection; in order for humor to signal creativity, the recipient must process an attempt at humor and discern good signals of creativity from poor signals of creativity (Miller, 2000). Therefore, over evolutionary time, as men competed to demonstrate creative displays to women, women should have evolved better ways for discerning good displays from poor displays.

Women who respond to humor production with laughter are signaling back to the man that they find him attractive as a potential mate, in that he has produced humor that meets their discerning filters (Miller, 2000).

While previous research does appear to support the theory of sex-based differences regarding humor preference and mate selection, (Bressler, Martin, & Balshine, 2006), these findings ignore the fluidity of gender in modern day society. Traditional views of masculinity and femininity as endpoints along a single continuum have since been challenged and criticized for being too narrow in defining an individual's gender identity (Donnelly et al., 2016). First created in the mid 1970's, The Bem-Sex Role Inventory (BSRI; Bem, S. (1974) was one of the first used to evaluate the fixed, pre-determined gender roles to which men and women were supposed to adhere by comparing gender identity with qualities stereotypically associated with their biological sex. Results from studies using the BSRI have established that traits of masculinity and femininity can occur in both men and women, sometimes with equal magnitude, and that such qualities are not mutually exclusive (Donnelly et al., 2016). Gender identity has been shown to influence humor preference and results in patterns of humor appreciation that deviate from the stereotypical responses said to be determined by biological sex (Brodzinsky et al., 1981). The purpose of this study was to explore the influence of gender identity on sex-based preferences of humor production and appreciation (Bressler et al's. (2006). Bressler et al's. (2006) questionnaire, which evaluates individual preferences of humor production, receptivity and importance of humor, was used to see if such preferences are influenced by gender identification as indexed by the BSRI. The next chapter presents a review of the literature and research regarding mate selection and

preference of humor from an evolutionary perspective and how gender identification may influence these preferences. The literature review will conclude with the rationale and hypotheses for the current study.

II. LITERATURE REVIEW

Natural selection and sexual selection through mate choice are two ways through which the strongest and most reproductively beneficial fitness traits are passed on and continue to persist in future offspring (Darwin, 1871). Through natural selection, individuals have adapted and survived via whatever biological, material, and environmental resources available to them. Sexual selection, however, is a more strategic way of ensuring reproductive success and allows individual's to "sift through the genetic quality", so to speak, of potential partners, using traits such as a sense of humor to decide whether to accept or reject them as mates (Miller, 2000). Based on the evolutionary theory of sexual selection first proposed by Charles Darwin in the 1800's, humans use certain traits to their advantage in order to attract potential mating partners. The more males stand out from the other males, the more suitable they are viewed by the females as potential mates (Darwin, 1871).

Males and females have evolved in psychologically similar ways when courtship turns psychological. They use the same mental techniques to produce displays that they use to judge the displays produced by others (Miller, 2000). To produce an effective display, it helps to anticipate how the display will be judged by the person to whom it is directed. One might mentally rehearse a joke before telling it to see if it will be successful in evoking laughter, and find another joke if it won't. Conversely, to be a good judge of something, it helps to be able to do it oneself. For females to judge which male tells the best jokes, they may benefit by improving their own joke-telling ability (Miller, 2000). The display of humor ability has been hypothesized to be a trait that has become an important factor in the formation of sexual attraction and desirability (McGee, 2009).

Past research on fitness indicators, traits that act as a signs of potential mating fitness, (Buss, 1989; Buss & Barnes, 1986; Feingold, 1992) has shown that the majority of human sexual relationships are based on attraction that is derived from displays of both physical and mental fitness. While examples of physical fitness can be seen in a person's body shape, facial features, how they dress, dance or their athletic ability, a person's mental fitness is internal and is revealed through language, cognitive abilities, problem-solving techniques and sociability. An individual's sense of humor is one way to signify creativity and intelligence and display competency as a potential mate (Miller, 2000).

Miller's theory is based on the costly signaling theory, also known as the handicap principle (Zahavi, 1975), in which various human abilities such as artistic and musical abilities, humor, moral virtue, and creativity have evolved as fitness indicators. A person's level of fitness is heritable, and their sense of humor can be an indicator of good genes. These ideas are derived from a sexual selection model of humor, in which intelligence was shown to predict humor ability, which in turn, predicted mating success, and that males were found to be better at producing humor relative to women (Greengross & Miller, 2011). Humor production in males was strongly associated with higher intelligence, which has in turn been associated with mating success, suggesting that intelligence can be demonstrated through the use of verbal humor (Greengross et al., 2011). Although humor is not the only indicator of intelligence, it does seem to serve as an important trait for mate selection (Greengross et al., 2011). Miller (2000) suggests that a good sense of humor falls into a category of human capacities that are viewed as attractive and indicative of good genes because it is hard to fake creativity and intelligence, implying that humor ability may be a marker of general genetic quality.

Although a good sense of humor has been reported as a universally appreciated and much desired trait in both sexes (Bressler et al., 2006), the definition of what constitutes a good sense of humor has been shown to differ between men and women. Specifically, men are thought to define a good sense of humor by how receptive others of the opposite sex are to humorous statements and behaviors, while women define a good sense of humor by how a potential mate displays humorous statements and behaviors (McGee, 2009). Therefore, if humor is an indicator of mental fitness, an examination of its production and appreciation across genders should help explain its role in interpersonal attraction. The following studies examine gender differences in the desirability of humor and the effects of humor production and appraisal on interpersonal attraction and mate selection in men and women and support the general notion that men value humor appreciation in potential mates, while women value humor production.

Evolutionary Theory of Humor Production and Appreciation

A good sense of humor has been indicated by both men and women as a desirable characteristic when seeking a potential partner across relationship types; however, men and women differ with respect to the significance they place on the use of humor when attracting the attention and interest of potential partners (Sprecher & Regan, 2002). Li et al., (2006) examined the influence of humor on attraction and level of interest in men and women by asking participants to respond to questions under four different scenarios defined by status (courtship, relationship), interest (attracted/satisfied, not attracted/satisfied) and interaction type (conversation, humor). Participants were asked to imagine one of the following; “imagine that you meet someone new in person, and you feel romantically attracted to them” (courtship, attracted condition) and to “imagine . . .

you are not romantically attracted to them” (courtship, unattracted condition).

Participants were also asked to “imagine interacting with your current long-term romantic relationship partner” (or, if not applicable, to “imagine being in a long-term romantic relationship and interacting with your partner”) and “you feel satisfied with the relationship” (relationship, satisfied condition) and “imagine . . . you feel unsatisfied with the relationship” (relationship, unsatisfied condition). For each of these four (counterbalanced) scenarios, participants answered questions regarding likelihood of initiating humor using a 9-point scale (1 = extremely unlikely, 9 = extremely likely; Li et al., 2006, p. 926). Both men and women were more likely to initiate humor when more romantically attracted to a potential mate or satisfied with an existing relationship partner. Men’s responses to humor in courtship scenarios depended more on level of attraction than women’s, where women’s responses to humor in existing relationships depended more on their satisfaction within their relationship (Li et al., 2006). This difference in humor initiation and appreciation between men and women demonstrates how, in both sexes, humor may be used more in order to increase the chances of conversation and interaction, but shows that women are more inclined to initiate humor with a romantic partner if they were in a satisfactory long-term relationship.

The initiation of humor in courtship situations was shown to differ between sexes by Wilbur et al. (2011), who examined how men and women use humor differently in getting to know prospective romantic partners. After reading a paragraph designed to depict a potential romantic partner, each participant rated the likelihood of using three humor strategies (productive, evaluative, and appreciation) to get to know the individual described. The strategy questionnaire contained twenty-two statements relevant to humor

consisting of three types of statements pertaining to humor production (e.g., “I would make a lot of jokes”), humor evaluation (“I would assess how good s/he is at telling jokes compared to other people I know”), and humor appreciation (“I would tell him/her that s/he was funny”). Participants then reported the likelihood of using each of these strategies on a 7-point Likert-type scale (1 = not all likely to do, 4 = somewhat likely to do, 7 = extremely likely to do). Men reported higher levels of humor production than women whereas women reported higher levels of humor evaluation than men in initiating relationships, indicating that men are more inclined to use humor when getting to know a potential partner and that women are more likely to use humor as a way of measuring relationship quality (Wilbur et al., 2011). These results are consistent with Miller’s (2000) theories in that relative to women, humor production and initiation will be more likely to be used by men when pursuing a partner.

To test these proposed sex differences of humor production and appraisal, Bressler & Balshine (2005) evaluated which sex was more attracted to humor and how humor influenced the perceptions of the humorist’s personality. Two hundred and ten undergraduate Psychology students were shown two facial photographs depicting two individuals of the same sex, opposite of their own (both male or both female) and of equal attractiveness. Each photo was presented individually eight times for a total of sixteen presentations, and paired with either humorous or non-humorous statements. In each trial, one picture in each series was presented with eight non-humorous statements (non-humorous individual), while the other was presented with five humorous statements (humorous individual) and three non-humorous statements. Each participant, after viewing all presentations, was then shown both pictures together and asked to choose

which individual was more humorous, desirable as a partner, and to rate them on a number of personality traits (Bressler & Balshine, 2006).

Results revealed that women demonstrated a greater preference towards male faces paired with humorous statements than those paired with non-humorous statements, while men did not show a greater preference for humorous women as relationship partners (Bressler & Balshine, 2006). Regarding attributions about personality, overall both men and women were more likely to rate humorous individuals of the opposite sex as attractive, independent, confident, and socially adept (Bressler & Balshine, 2006). This responsiveness to humorous statements would be supportive of women evolving an ability to detect evidence of creativity from potential male suitors. The study by Bressler and Balshine (2006) was able to determine that humorous men were rated by women as more desirable than non-humorous men in regard to being a potential partner; however, it did not examine the importance or prevalence of humor in different types of relationships (i.e. dating versus long term).

Bressler, Rod, Martin and Balshine (2006) extended their research of how humor preference and production signals sexual interest and the importance of humor production and appreciation in different types of relationships. One hundred and twenty-nine participants (74 women and 55 men) were given a series of questionnaires to identify individual sense of humor as well as a series of short vignettes designed to portray funny or non-funny men and women to be rated by the opposite sex. Participants were then asked to choose one individual as a partner for a one-night stand, a date, a short-term relationship, a long-term relationship and a friendship. Funny men were rated by women as more desirable for all categories, implying that their ability to produce humor was

associated better genetic quality (e.g., creativity and intelligence) (Miller, 2000). Funny women did not receive higher desirability ratings when judged by the men; however, those women who were displayed as receptive and responsive to the jokes of men were rated higher by men across all categories, suggesting that their responsiveness was attributed as a signal of sexual interest. As mentioned, results indicated that women showed significant preferences for male humor producers in all relationship types. This expansion of Bressler et al., (2006) research on sex differences in humor production and appraisal suggest that humor can positively affect desirability as a relationship partner; however, this effect is most likely to occur when men use humor strategies and are evaluated by women.

With respect to relationship types and how the appearance of having a good sense of humor would affect the selection of a partner depending on the level of commitment to a relationship, McGee (2009) found similar sex-based differences in humor preferences in long-term mate choice. Her work examined how the appearance of having a good sense of humor would affect one's decision in choosing a long-term mate. Ninety heterosexual men and ninety heterosexual women were asked to read a short vignette describing a potential partner that was described as having either a good, average, or no sense of humor. Participants were presented with vignettes constructed to describe a hypothetical potential male (James) and female (Chloe) long-term partner. Based on evolutionary theory, each target was described as having positive traits associated with their sex; therefore, Chloe was depicted as being young, single, physically fit, healthy and attractive and James was described as single, ambitious, healthy, attractive, and loyal with the desire to settle down. Vignettes varied only in the description of the target's

sense of humor and were manipulated into one of three conditions; good sense of humor, average sense of humor, and no sense of humor (McGee, 2009).

Participants were asked to rate each target presented in terms of attractiveness and suitability as a long-term partner on a 7-point Likert type scale; (1 = very unattractive, 7= very attractive) and (1 = very unsuitable to 7 = very suitable). Both targets (Chloe and James) described as having a good sense of humor received significantly higher ratings than those described as having an average or no sense of humor. Results also indicated that as the levels of commitment and length of relationship increased so did the perceived importance of humor production in both men and women, suggesting that a good sense of humor is a desirable trait in a potential heterosexual relationship partner in either sex. In accordance with past studies, humor was an important factor in the attraction and formation of relationships and although this study did not investigate the proposed gender differences in preference of humor, it did demonstrate how the appearance of a good sense of humor influences the selection of a partner.

The previous studies discussed indicate that humor can positively affect the desirability of a partner and enhance the perception of positive traits and psychological attraction (Bressler et al., 2006; 2006). Overall, they provide support for Miller's (2000) theory that humor production is a more desired trait in men, at least for heterosexual women. They also demonstrate that men and women use and interpret humor differently when it comes to sexual attraction and how the appearance of a good sense of humor can influence mate selection (McGee, 2006). Although these studies support the notion that humor plays an important role in mate selection and that both men and women seem to value a sense of humor when considering a relationship, they focus solely on biological

sex and ignore other societal factors such as an individual's gender identity. These factors are explored in further detail below.

Gender Roles; Masculinity, Femininity and Androgyny

While previous research provides evidence of sex-based differences in humor preferences and mate selection, these findings ignore the fluidity of gender identity in modern day society. The stereotypical view of masculinity and femininity as endpoints along a single continuum has since been challenged and criticized for being too narrow in defining an individual's gender identity (Brodzinsky et al., 1981; Donnelly et al., 2016). First created in the mid-1970's, the Bem-Sex Role Inventory (BSRI; Bem, 1974) was one of the first scales used to evaluate the assumption of fixed, pre-determined gender roles that men and women were supposed to adhere to by comparing gender identity with traits associated with their biological sex. The inventory consists of two sets of traits, the masculine scale of the BSRI contains qualities stereotypically associated with men (e.g., assertive, independent, ambitious), and the feminine scale contains qualities stereotypically associated with women (e.g., gentle, gullible, warm). BSRI data in this initial study demonstrated that both masculine and feminine traits can occur in both men and women, sometimes with equal magnitude (androgyny) and that these qualities are not mutually exclusive (Bem, 1974).

These BSRI results challenged stereotypical gender schemas and, in turn, gained popularity with researchers who wished to examine how masculine and feminine traits have changed over the years, especially with regard to how people view themselves psychologically (Donnelly et al., 2016). Using a cross-temporal meta-analysis of U.S college student BSRI scores between 1993 and 2012, Donnelly et al., (2016) investigated

how masculine and feminine traits have changed over the past 19 years among U.S. college students. Changes from 1974 to 2012 showed a significant decrease in feminine traits scores and an increase in levels of androgyny and masculine traits in women. Men were not found to exhibit higher scores in feminine traits over time and their masculinity and androgyny remained stable; however, this was believed to be due to males' willingness to adhere and display more masculine traits to avoid negative social stigmas (Donnelly et al., 2016). These changes in masculinity and femininity, at least in women, may reflect the adoption of new norms regarding social roles. As society's views on women have changed, the more acceptable the adoption and display of masculine traits by women have seemed to become (Donnelly et al., 2016). This study demonstrates how the changes women's roles might correspond with changes in personality traits and gender identity and how humor preferences may have changed to fit emerging cultural patterns, allowing women to feel freer to express masculine traits.

The BSRI has been used to demonstrate that gender identification is more fluid than originally assumed, therefore, there appears to be culturally-specific inputs to our evolved mechanisms that could function to shift an individual's gender identity to be more similar to that of the opposite gender. Women today appear to be less likely to endorse feminine traits than women were in the 1990s (Donnelly, 2016), possibly reflecting the devaluation of feminine qualities either on a personal or cultural level. Women have also shown an increase in BSRI-measured masculine traits and androgyny, creating a picture of generational change (Donnelly, 2016) and demonstrating that women have become less willing to endorse traits clearly associated with one gender versus another. The original conceptions of masculinity and femininity as a function of

one's biological sex may be different for men and women in today's society and may influence changes in other conceptions, such as the importance of humor in romantic relationships. Furthermore, while sex may be a factor in humor appreciation, it is not known whether these relationships are mediated by gender identification.

Gender Identification and Humor

As previously discussed, the evolutionary theory of humor production and appreciation suggests that men prefer a woman who laughs at their jokes, while women prefer a man who can make them laugh (Bressler et al., 2006). This theory defines sex differences only in terms of biological sex; however, studies using the BSRI demonstrate that not all men and women fall into this clean-cut definition of masculinity/femininity. More specifically, being biologically male does not necessarily make one more likely to portray strictly masculine traits, just as not all biological females display only feminine traits. The acceptance of an individual's psychological sex (gender identity) allows for a more accurate perspective on how men and women perceive themselves, regardless of biological sex (Brodzinsky et al., 1981). Regarding humor, a number of questions can be examined when looking at humor appreciation in individuals from various gender identity groups. For example, whether a relationship exists between the humor preference patterns of biological males and females and their gender identity counterparts remains uncertain. More specifically, biological males that identify as more feminine may find the ability to produce humor more important in a prospective mate than humor appreciation, with the opposite being true for females in that more masculine females may seek out those who appreciate their humor and therefore are more likely to use humor production when attracting a mate. Furthermore, less is known about the humor

preferences of androgynous-typed individuals. Bem (1975) has suggested that androgynous individuals are more adaptable than those from other identity groups in that they are able to adopt either masculine or feminine behavior to fit a particular situation. The study described below examines the possible influences that an individual's gender identity (BSRI score) could have on the appreciation of humor.

Brodzinsky et al., (1981) examined appreciation of cartoon humor in 160 male and female college students who had been categorized into one of four gender identity groups; masculine ($> +10$), feminine (> -10), androgynous (+ 9 to - 9) and undifferentiated based on their BSRI scores. Participants were presented with 21 cartoons previously rated and categorized by theme; sexual theme, with a male as a "sex object" or brunt of the joke (SM), sexual theme, with a female as "sex object" or brunt of the joke (SF), absurd theme (AB), or uncertain, and asked to rate each cartoon on five-point scale in terms of funniness (1 = not funny, 5 = extremely funny). In addition to self-report, the experimenter was asked to rate each participant's mirth (reaction in response to each cartoon; 1 = blank expression, 2 = slight smile, 3 = full smile, 4 = chuckling or laughter). Results of behavioral reactions based only on biological sex indicated that males tended to smile and laugh more than females to the humorous stimuli and displayed significant differences in mirth responses (smiling or laughter) to the various cartoon types, whereas females produced about the same level of mirth to all cartoons. Overall, men and women preferred SF cartoons more than either SM or AB cartoons, but women rated AB cartoons as funnier than SM and SF cartoon and men rated SF cartoons funnier than SM cartoons which were rated funnier than AB cartoons. Furthermore, while males rated SF cartoons as funnier relative to females, the reverse

was seen for AB cartoons.

Results comparing men and women on biological sex alone indicated that men and women displayed different patterns of humor preferences (Brodzinsky et al., 1981). Males tended to prefer sexual humor and rated it higher than absurd humor; whereas in women, the reverse pattern was shown. However, after accounting for gender identity, only the feminine females showed “typical” female humor preference patterns towards absurd humor. Masculine and androgynous females reported being comfortable with and able to enjoy sexual humor to the same extent as their male counterparts (Brodzinsky et al., 1981). These results suggest a more complicated picture of humor appreciation and diverges from previous findings where men and women were treated as unitary groups. Each group of individuals were assumed to have experienced the same general pattern of socialization and to therefore have developed the same gender identity (Brodzinsky & Rightmyer, 1980, Brodzninsky Rubien, 1976). As the limited research with the BSRI has shown, this assumption of strict delineation in gender identity is invalid, as both males and females are not only capable of developing gender identities incongruent with biological sex, but are also capable of attributing both male and female traits to themselves. Therefore, it is possible that gender identity is a mediating factor in the importance of humor production (thought to be more important in males according to Miller, 2000) and appreciation (thought to be more important in females; Miller, 2000) in mate attraction/selection.

The results of Brodzinsky et al., (1981) demonstrate how an individual’s gender identity can influence humor preference and result in patterns of humor appreciation that deviate from the stereotypical responses said to be determined by biological sex. Results

indicated a greater variability in masculine/feminine traits and humor preferences in females than males, but overall, it appears that the evolutionary theory of humor production and appreciation may be limited in its ability to explain humor preferences by biological sex alone. Much more research is needed to examine how an individual's ascribed gender role may provide a more accurate predictor of humor appreciation and production.

To summarize, humor is an important social trait used to assess desirability and mate selection (McGee, 2009). The studies previously discussed demonstrate how men and women differ in their preference for humor, in that men rely on the ability to produce humor to attract mates, whereas women appreciate and evaluate humor in potential partners (Bressler et al., 2006, 2006). However, research based on this evolutionary theory of humor only evaluated humor preferences using biological sex and ignored the possible effects of gender identity. Upon the introduction of Bem's BSRI (Bem, 1974), the strictness and adherence of stereotypical gender roles has since been challenged. Studies incorporating and/or evaluating the BSRI have allowed for the examination of how gender roles interact with personality traits and how these differ between men and women (Donnelly, 2016). This research systematically examines how humor preferences vary as a function of biological sex and gender identity.

Study Rationale

The studies discussed above all demonstrate sex differences in humor preference and production and theorize how these differences have evolved as an indicator of mental fitness and attractiveness. Past research in this area, (Bressler et al., 2006; McGee, 2009) has ignored the potential influence of gender identification. A person's gender identity is

thought to lie on a continuum, in that there are various degrees of gender identification; not all females are stereotypically female, just as not all males are stereotypically male (Drucker, 2011). The current research explored the influence of gender on preference of humor production and receptivity.

Humor production and receptivity were measured and evaluated using Bressler et al.'s (2006) categorization questionnaire. This questionnaire was chosen to examine humor preferences due to its frequency of use in the examination of humor preferences (Bressler et al.'s., 2006). Participants were asked to select the gender with which they most identified (male or female) and completed the Bem Sex-Role Inventory (BSRI) in order to measure individual identification with traditionally masculine and feminine qualities. The BSRI measures how individuals view themselves psychologically by specifically assessing their identification with gendered personality traits. For example, the masculine (M) scale of the BSRI contains qualities stereotypically associated with men (e.g., assertive, independent, ambitious), and the feminine (F) scale contains qualities stereotypically associated with women (e.g., gentle, tender, warm). Level of androgyny was hypothesized to be predictive of preference of humor in that participants scoring as more masculine would show a higher preference for receptivity of humor, while those receiving scores indicative of feminine qualities would show a greater preference for humor production.

The BSRI has been one of the most widely used instruments in the measure of masculinity and femininity in that the original 60 item and shorter versions of the BSRI have been used in various countries including France (Alain, 1987), Germany (Streiner & Norman, 2008), Spain (Mateo & Fernández, 1991), Japan (Katsurada & Sugihara,

1999; Sugihara & Katsurada, 2000), India and Malaysia (Ward & Sethi, 1986), China (Zhang, Norvilitis, & Jin, 2001), Turkey (Özkan & Lajunen, 2005), Canada (Gale-Ross et al., 2009), and Brazil (Carver et al., 2013). The BSRI has also been used to examine gender identity across different age groups of adolescents (Fontayne et al., 2000; Wilcox & Francis, 1997), adults (Bledsoe, 1983; Mateo & Fernández, 1991), and seniors (Carver et al., 2013, Gale-Ross et al., 2009; Windle & Sinnott, 1985) and appears to be reliable and valid across geography, age groups, and cultures. Several researchers have replicated the item selection procedure for the BSRI (Edwards & Ashworth, 1977; Walkup & Abbott, 1978). Many studies have examined the factor structure of the BSRI (e.g., Feather, 1978; Gaudreau, 1977; Moreland et al., 1978; Waters et al., 1977) and have provided the type of validation evidence for the BSRI that is usually most neglected for psychological measures of the relationship of scale scores to overt behaviors (Bem, 1975; Bem & Lenney, 1976; Bem, Martyna, & Watson, 1976). As Brannon (1978) points out, the aggregate of evidence from these studies “provides ample behavioral evidence for the construct validity of the BSRI - the only gender-related instrument for which this statement can currently be made” (p. 699).

Given the amount of research confirming the reliability and validity of the self-report measures included in the previous paragraphs, their use in the current study is justifiable and will also allow for direct comparisons with other studies using these scales. Males and females were predicted to show differences in humor preference based on the gender that they identify with, in that males will show preferences towards humor appreciation, while women will show a preference for humor production. However, it was hypothesized that these differences will be mediated by gender identity as indexed

by the BSRI. Specifically, individuals scoring higher in masculinity should rate humor appreciation more highly as a valuable quality in a potential mate. Conversely, individual scoring higher in femininity should rate humor production as a valuable quality in a potential mate more highly than those lower in femininity. Regardless of biological sex, both masculine males and females should rate humor appreciation as more important, while feminine males and females should rate humor production as more important. If levels of masculinity/femininity and are shown to influence humor preference, this would suggest that humor differences are not only affected by biological sex, but also by socially derived factors.

III. RESEARCH DESIGN AND METHODS

Participants

Three hundred and seventy individuals participated in this study; however, 45 were excluded due to excessive incomplete responses, leaving 325 (98 males and 227 females) ages 18 to 62 ($M = 23.10$, $SD = 6.714$). Participants were recruited from the undergraduate student population in the Psychology Department at Texas State University and via social media, who had normal or corrected-to-normal vision, and the ability to read and understand the English language. Participants in undergraduate Psychology courses were recruited via SONA and all other participants through Facebook. This project and its procedures were approved by the Texas State University Institutional Review Board.

Individuals interested in volunteering in this study were provided with a link to an online survey on Qualtrics (Provo, Utah) and asked to complete the required questionnaire and demographic information for this study. Before completing the questionnaire, each person read a consent statement (Appendix A) and were then asked to give electronic consent indicating that they read the consent statement and agreed to participate in the study.

Self-Report Measures

Participants were asked some basic demographic questions about their age, sex, and gender, and completed questions that index sex roles and humor preferences. Bressler et al's., (2006) questionnaire was used to examine humor preferences. The questionnaire consists of eight statements, four measuring the importance of a partner's humor production and four measuring the importance of a partner's receptivity to humor.

Participants were asked to rate each of the eight statements with their agreement based on a five-point scale (1 = *strongly disagree*, 2 = *slightly disagree*, 3 = *neither agree nor disagree*, 4 = *slightly agree*, 5 *strongly agree*). (See Appendix B for a full list of statements.) The eight questions used to evaluate humor were divided into two sub-groups; importance of humor production and importance of humor appraisal. This questionnaire was used to examine humor preferences due to its frequency of use in the examination of humor preferences (Bressler et al., 2005; 2006). Participants with missing values from this questionnaire were not included in the study.

The Bem Sex-Role Inventory (BSRI, Bem 1974) was used to examine the influence of gender on the preferred humor preference in a potential mate due to its popularity of use and because it has received consistent positive ratings towards its reliability and validity within the scientific community (Brannon, 1978). The BSRI lists 60 different personality traits where participants rate themselves on a 7-point Likert scale. These traits are then scored in order to receive a measure of that individual's level of masculinity and femininity (Bem, 1974). Level of androgyny were represented by an individual's Bem score, calculated by taking the totals of specific personality traits that indicate masculine, feminine or androgynous. More specifically the scores fall into one of five categories; masculine ($> +20$), nearly masculine (+10 to +19), androgynous (+9 to -9), nearly feminine (-10 to -19) and feminine (< -20) (See Appendix C). Missing values were replaced with the average score of the other responses in that subscale.

Statistical Analysis

The design used for this study was a basic, within-subjects design, and the data was analyzed using mediation models and linear regressions. Responses to Bressler et al's. (2006) questionnaire on the importance of humor production were summed for each participant to create a total score for this subscale. Similarly, responses to the importance of appreciation from Bressler et al's. (2006) questionnaire were summed so each participant received a total score for humor appreciation. Gender identity as indexed by the BSRI was determined by creating a Bem score (Masculine traits minus Feminine traits; see Appendix C). Two mediation models, one for humor production and one for humor appreciation, were used to determine if an individual's Bem score mediates the relationship between sex and humor preferences.

The mediations were run using PROCESS, an observed variable path analysis modeling tool for SPSS (Hayes, 2013). It was chosen because of its ability to estimate direct and indirect effects in single and multiple mediator models, two and three-way interactions in moderation models along with simple slopes and regions of significance for probing interactions, and conditional indirect effects in moderated mediation models with a single or multiple mediators or moderators (Hayes, 2013). If the lower limit (*LL*) and upper limits (*UL*) of the mediation models are found to contain zero than the mediation of Bem scores between sex and humor preference. An absence of zero between the lower and upper limits would show Bem scores to be significant as a mediator variable between sex and humor preferences (Hayes, 2013).

The first mediator model, using production as the criterion variable and sex as the predictor, examined if an individual's Bem score mediates the relationship between sex and humor production. The second mediator model used appreciation as the criterion variable and sex as the predictor to examine the mediating effects of Bem score between sex and humor appreciation. In the event of any significant effects of biological sex, independent samples *t*-tests were also conducted to clarify the nature of these sex differences in the importance of humor production and appreciation. Four follow-up linear regressions were then conducted; two for humor production and two for humor appreciation. The regressions, separated by sex, were conducted due to the inequality of female to male participants and the greater range and distribution of scores among female than male participants. Therefore, separate linear regressions for each sex were included to determine if the lack of variability among male participants had obscured the possible effects of Bem score on humor production and appreciation in females.

IV. RESULTS

Descriptive Statistics

The sample population consisted of 98 males (age; $M = 23$, $SD = 5.9$) and 227 females (age; $M = 23$, $SD = 7$). Although there were participants from different ethnicities, the majority were white/Caucasian (52%) and Mexican/Latino (30.5%), followed by African American (9.8%), Asian (2.8%) and other (4.9%). Responses regarding sexual orientation indicated that 81% of participants identify as heterosexual, with only 13% bisexual and 6% homosexual. Bem scores for male participants tended to fall towards the masculine side of the spectrum, whereas the majority of women fell into the middle indicating high levels of androgyny (See Table 1 below for demographics).

Table 1.

Demographic information for all participants.

		Males		Females	
		mean	SD/%	mean	SD/%
Age		23.02	5.92	23.14	7.04
Ethnicity	White/Caucasian	50	0.51	119	0.52
	Black/African American	7	0.07	25	0.09
	Mexican/Latino	35	0.36	64	0.21
	Asian	2	0.02	7	0.03
	Other	4	0.04	12	0.04
Sexual Orientation	Heterosexual	86	0.88	178	0.78
	Bisexual	5	0.05	37	0.26
	Homosexual	7	0.07	12	0.06
BEM_Masculine		97.86	16.63	91.67	13.38
BEM_Feminine		87.62	14.12	97.26	13.63
BEM_Androgynous		89.80	11.27	90.19	9.21
BEMscore		10.24	18.68	-5.59	16.78
BEMcategory	masculine	24	0.24	15	0.15
	nearly masculine	24	0.24	19	0.21
	androgynous	35	0.36	110	1.26
	nearly feminine	10	0.10	37	0.70
	feminine	5	0.05	46	1.08
Humor Production		18.20	4.91	21.94	4.18
Humor Appreciation		19.35	4.36	20.66	4.33

Since participants, recruited by SONA, were from the undergraduate Psychology department at Texas State University and all other participants were recruited through Facebook, the results of demographic questionnaires were divided further into two sub groups, SONA (See Table 2) and Facebook (See Table 3) in order to see how factors such as age or ethnicity may have affected Bem scores and humor preferences. The sample population of SONA participants consisted of 81 males ($M = 21$, $SD = 3.1$) and 168 females ($M = 20.6$, $SD = 3.9$). Bem scores for the SONA population showed a similar distribution of score for both males and females as male tended to score masculine, nearly masculine and androgynous and the majority of females scoring as androgynous, with a slightly higher distribution towards the feminine side of the scale.

Table 2.

Demographic information for participants recruited via SONA.

SONA		Males		Females	
		mean	SD/%	mean	SD/%
Age		21.0	3.1	20.6	3.9
Age Range		18(min)	36(max)	18(min)	45(max)
Ethnicity	White/Caucasian	40	49.4	73	43.5
	Black/African American	6	7.4	23	13.7
	Mexican/Latino	29	35.8	57	33.9
	Asian	2	2.5	5	3.0
	Other	4	4.9	10	6.0
Sexual Orientation	Heterosexual	72	88.9	142	84.5
	Bisexual	4	4.9	17	10.1
	Homosexual	5	6.2	9	5.4
BEM_Masculine		99.7	16.7	92.6	12.9
BEM_Feminine		88.6	14.1	97.7	13.9
BEM_Androgynous		90.7	11.5	90.4	9.1
BEMscore		11.0	18.8	-5.1	16.0
BEMcategory	masculine	20	24.7	11	6.5
	nearly masculine	20	24.7	13	7.7
	androgynous	30	37.0	86	51.2
	nearly feminine	7	8.6	26	15.5
	feminine	4	4.9	32	19.0
Humor Production		18.3	4.9	22.1	4.0
Humor Appreciation		19.5	4.3	20.7	4.4

The sample population of Facebook participants consisted of 17 males ($M = 32$, $SD = 6.9$) and 59 females ($M = 30.4$, $SD = 8.8$). Participants recruited through Facebook were from a higher age range than those recruited through SONA as the age ranges for men were between 21-47 and women 30-62. The Bem scores of women tended to fall in the androgynous category with a higher distribution of feminine score than masculine scores. The Bem scores from males were not examine due to the small sample size in this sub group.

Table 3.

Demographic information for participants recruited via Facebook.

Facebook		Males		Females	
		mean	SD/%	mean	SD/%
Age		32.5	6.9	30.4	8.8
Age Range		21(min)	47(max)	18(min)	62(max)
Ethnicity	White/Caucasian	10	58.8	46	78.0
	Black/African Am	1	5.9	2	3.4
	Mexican/Latino	6	35.3	7	11.9
	Asian	0	0.0	2	3.4
	Other	0	0.0	2	3.4
Sexual Orientation	Heterosexual	14	82.4	36	61.0
	Bisexual	1	5.9	20	33.9
	Homosexual	2	11.8	3	5.1
BEM_Masculine		89.2	13.6	89.5	13.8
BEM_Feminine		82.7	13.3	96.3	11.8
BEM_Androgynous		85.4	9.1	89.7	8.5
BEMscore		6.5	18.0	-6.7	19.1
BEMcatagory	masculine	4	23.5	5	8.5
	nearly masculine	4	23.5	6	10.2
	androynous	5	29.4	23	39.0
	nearly feminine	3	17.6	11	18.6
	feminine	1	5.9	14	23.7
Humor Production		17.8	4.9	21.6	4.6
Humor Appreciation		18.7	4.8	20.5	4.2

Mediation Models

In the first mediation model, biological sex served as the predictor variable, importance of humor production was the criterion variable, and Bem scores served as the mediating variable. Results revealed that biological sex significantly predicted importance of humor production, $\beta = -.15.83$, $t = 6.548$, $p = .0000$. This relationship was not mediated by Bem scores ($LL: -.52$; $UL: .42$). Mediation path weights are shown in Figure 1 ($*p < .05$, $***p < .001$).

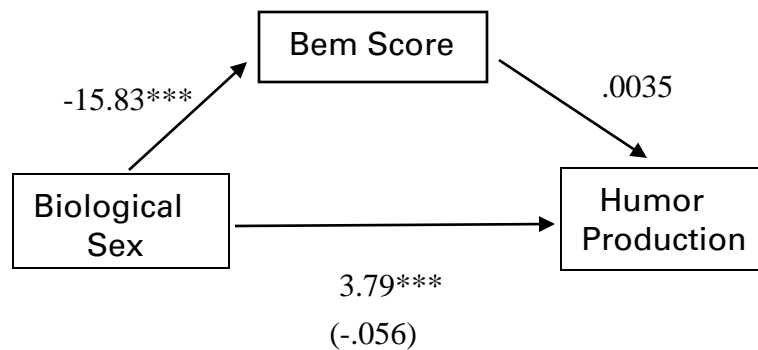


Figure 1. Mediation model 1: Bem scores as a mediator of the relationship between biological sex and the importance of humor production.

In the second mediation model, biological sex served as the predictor and the importance of humor appreciation worked as the criterion variable, while the mediating effects of Bem score were also examined. Results of this analysis indicated that biological sex was a significant predictor of importance of humor appreciation, $\beta = -.15.83$, $t = 1.9665$, $p = .0501$. This relationship was not mediated by Bem scores ($LL: -.25$; $UL: .66$). Refer to Figure 2 for mediation path weights ($*p < .05$, $***p < .001$).

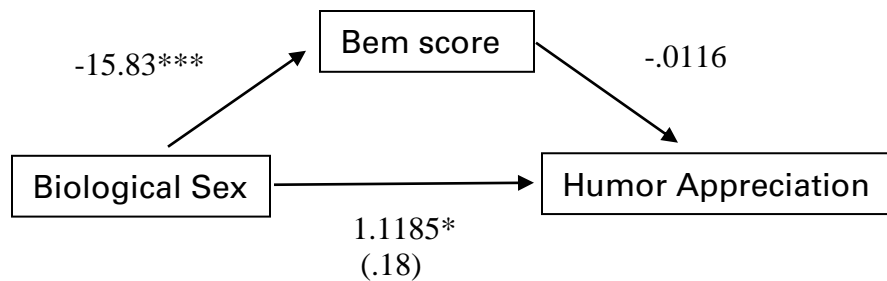


Figure 2. Mediation model 1: Bem scores as a mediator of the relationship between biological sex and the importance of humor appreciation.

Independent *t*-tests and regressions

Independent *t*-test results revealed that women valued humor production $t(323) = -7.006, p = .000$ and humor appreciation $t(323) = -2.485, p = .013$. more so than men (See Table 1). Next, four linear regressions that focused on the examination of males and females separately were conducted due to the larger number of female respondents vs. males in the sample, as well as the imbalance in the distribution of Bem scores in male respondents. In the first regression, the Bem score from males served as the predictor and importance of humor production worked as the criterion variable. Results indicated that the Bem score for males was not a significant predictor for importance of humor production $\beta = .100, t = .989, p = .323$. In the second regression Bem scores from males served as the predictor and importance of humor appreciation worked as the criterion variable. The results from the second regression indicated that Bem score was also not a significant predictor for importance of humor appreciation for men, $\beta = .067, t = .655, p = .514$. The next two regressions looked at the relationship between Bem scores on humor production and appreciation the same way as above using only Bem scores from

female participants and found that Bem score was not a significant predictor of importance of humor production, $\beta = -.035$, $t = -.519$, $p = .604$ or humor appreciation, $\beta = -.101$, $t = -1.525$, $p = .129$ for women.

V. DISCUSSION

Humor is an important social trait used to assess desirability and choice of a potential mate (McGee, 2009). While previous research has provided a substantial amount of evidence of sex based differences in the production and appreciation of humor and their importance in mate selection, (Bressler, Martin, & Balshine, 2006), these studies neglected the possible influence that societal factors such as gender identity may have on the desirability of these humor preferences. Research into gender identity has demonstrated that not all males are masculine and not all females are feminine, in spite of biological sex (Donnelly et al., 2016). These original conceptions of masculinity and femininity as a function of one's biological sex are different for men and women in today's society and may influence changes in other conceptions, such as the importance of humor in romantic relationships (Donnelly et al., 2016). Furthermore, while sex may be a factor in humor appreciation and production, it is not known whether these relationships are mediated by gender identification and therefore the interrelationships between all three of these variables (biological sex, gender identity and humor preference) require further examination.

The main objective of this study was to determine if gender identity influences or mediates the relationship between biological sex and humor preference. Biological sex was predicted to remain consistent with past literature in that men would value humor appreciation more than women and women would value humor production more so than men. Gender identity, as indicated by level of masculinity/femininity (Bem score) was predicted to influence humor preferences regardless of biological sex, in that more masculine individuals would value humor production more than appreciation with the

reverse being true for females. Results indicated that biological sex remained a significant factor in the importance of humor; however, they were not consistent with past research as females were found to value both humor production and appreciation more than males. The hypothesis that an individual's level of masculinity/femininity influences humor preferences was not supported by this study, as participants scoring as more masculine did not show a higher preference for receptivity of humor in potential mates, just as individuals higher in feminine qualities did not show a greater preference for humor production. These results will be discussed in more detail in the following paragraphs.

The first hypothesis was that women would value humor production more than men. An independent *t* test and mediation model found this to be consistent with past research as women were shown to value humor production more than men. These results were expected, due to the abundance of research discussed in the above literature review of the evolutionary theory of humor production and appreciation in regard to sexual selection and mate theory. These findings support previous studies on mate selection where women prefer a man that makes them laugh and therefore value the production of humor in a potential mate (Bressler et al., 2006).

The second hypothesis was that males would value humor appreciation more than women. A second mediation model did not support this hypothesis, as women were also shown to value humor appreciation more than men. The idea that men would value humor appreciation more than women is based on the assumption that men are more likely to use humor production to attract a mate, therefore it assumed that being funny is a masculine trait (Brodzinsky & Rubien, 1976). Males are often assumed to be funnier

than women (Mickes, Walker, Parris, Mankoff & Christenfeld, 2011); however, this belief that men hold a greater capacity for humor may just be another sex-based misattribution. More specifically, attributing one's biological sex to humor ability when it really has no connection or association.

Two hundred and twenty-eight college students were shown 20 cartoons with two captions, one male authored and one female authored. Cartoons were presented one per page, with both the male and female captions presented below their corresponding cartoons (Hooper, Sharpe, & Roberts, 2016). For the 20 cartoons, this resulted in 14 male captions appearing first of the two captions, and six female captions appearing first. Order of cartoons was chosen randomly, and cartoons and captions were presented in the same order for all participants. All cartoons and captions were presented a first time with a Likert scale anchored from 1 = *not funny at all* to 5 = *very funny*. After rating all cartoons for their humor, the cartoons were presented as a set to participants a second time. For the second presentation, participants were asked to identify whether each cartoon caption was believed to be written by a man or a woman. Participants were then asked one final question—whether they believed that apart from this study, men or women are funnier or both genders are equally funny (Hooper, Sharpe, & Roberts, 2016).

Results indicated that, overall, the men and women who participated in the study overwhelmingly regarded men to be funnier than women. Yet when ratings of the cartoon captions for humor were examined, it was female-authored cartoon captions that were rated as somewhat funnier by both male and female participants and even though men were not found to write funnier captions than women in the present study, participants overwhelmingly regarded men to be funnier than women. This study demonstrates that

this male-favored view of humor remains a stereotyped form of social bias by drawing attention to the evidence that although there may be a belief that men are funnier than women, there is certainly no conclusive empirical study to support this. The current study provides evidence that women are valuing the production and appraisal of humor more than their male counterparts and may indicate a purposeful deviation from traditional gender norms, as women today have become less likely to adhere to stereotypical feminine traits and behaviors than women were in the 1990s (Donnelly, 2016). Furthermore, as previously discussed, there may also be a relationship among women between the production of humor and the ability to appreciate it. Miller (2000) proposed that to be a good judge of something, it helps to be able to do it oneself. If females are to judge which males tell the best jokes, then they may benefit from improving their own ability to tell jokes. This could explain why women were shown to value both production and appreciation more than men. Further examination of the relationship between humor appreciation demonstrated that humor appreciation and humor production were significantly correlated for women, $r = .57, p < .00$, demonstrating that as the importance for humor appreciation increases so does the importance of humor production.

Another possible explanation for the results obtained is that women value humor overall more than men. A cross national study evaluated 119,733 men and 98,462 women who chose from a list of 23 traits, and were asked to rate which they considered first, second, and third most important in a relationship partner. Initial analyses showed that there were nine traits in the list of 23 assessed that were consistently ranked to be among the three most important traits in a relationship partner. These top nine traits were the same for men and women, but men and women differed in the relative importance assigned to

specific traits. Men ranked physical attractiveness higher than women did, whereas women ranked a number of character traits, honesty, humor, kindness, and dependability higher than men did. Rank ordering of traits, mean trait rankings, and percent of participants choosing a trait as one of the three most important traits in a partner revealed humor as the third most important for men and the most important trait for women (Lippa, 2007).

The observed difference in men's and women's ranking of traits was consistent across countries and cultures and theorized that the possible cause of this consistent sex based difference is an evolved predisposition for men to emphasize such outward characteristics and qualities like physical attraction more so than females (Lippa, 2007). Humor production, theorized to be indicative of intelligence and creativity (Miller, 2000), has been linked to an individual's resourcefulness, social-economic status and financial prospects, all traits that women report as important when seeking a long-term partner (Feingold, 1992; Sprecher, Sullivan, & Hatfield, 1994); therefore, women may value more intrinsic traits, such as humor, when selecting a partner. Results of current study seem to support the idea that humor is more important to women as they indicated that both humor production and appreciation are more important in a romantic partner than men.

The third and final hypothesis was that an individual's gender identity, indicated by Bem score, would mediate the relationship between sex and humor preference so that masculine individuals, regardless of sex would value humor appreciation and feminine individuals would value humor production. Overall, men received Bem scores categorized as more masculine. Women, however, had a wider distribution of Bem

scores throughout all categories with the majority of scores falling into the androgynous category (See Table 1). These results are consistent to those found in previous research (Donnelly et al., 2016). While past analyses of Bem score data from 1974 to 2012 revealed a significant decrease in femininity traits resulting in higher levels of androgyny and masculinity, men's level of masculinity remained the same and did not show any increase in femininity (Donnelly et al., 2016). The lack of changes in men's Bem's scores were believed to be due to an unwillingness to admit and display more feminine traits to avoid possible embarrassment or social stigma. Changes for women were thought to reflect the adoption of new social roles and the desire to tear down gender-stereotyped normative behavior. It also seems to be more socially acceptable and common for women to adopt and display masculine and androgynous traits (Donnelly et al., 2016). The results of the current study converge with the Donnelly et al., 2016 meta-analysis and may indicate that while men continue to adhere to the culturally appropriately standard of masculinity, women continue to be less willing to endorse traits clearly associated with one gender versus another.

Bem score data demonstrated sex based differences in score level, and the effects of this score on the relationship between sex and humor preference was examined. Two mediation models were conducted, one for humor production and one for humor appreciation. Neither model produced significant results, indicating that gender identity does not mediated the relationship between biological sex and humor preferences. However, this may be due to the fact that sex and gender are highly correlated. The beta weights between sex and gender in both mediations models were $-.15$ indicating an extremely high level of collinearity between sex and gender (see Figures 1 and 2). This

may be the reason why past research has chosen not to look at gender as a separate variable in the relationship between sex, humor preferences and mate selection.

Multicollinearity is a problem because it undermines the statistical significance of an independent variable (“Multicollinearity: Definition, Causes, Examples” 2017). Since sex and gender are so highly correlated it is not possible to assess their relative importance to determine their effects on humor preferences. The mediating effects of gender may be masked by the high level of collinearity.

Another possibility that may account for the lack of relationships observed between Bem scores and humor indices is that the BSRI may not be the best way to measure gender identity. For over forty years, the BSRI has been the most widely used instrument among researchers investigating gender role orientation; however, some argue its repeated use has been without sufficient attention to its theoretical framework (Hoffman, 2001). Evaluations of the BSRI have found that there is an absence of theoretical definitions for each construct being measured; more specifically, what exactly is being measured by the BSRI has come into question (Smiler & Epstein, 2010). Spence and Helmreich's (1981) analysis of the BSRI led them to conclude that, like their own instrument (i.e., Personal Attributes Questionnaire; Spence, Helmreich, & Stapp, 1978), the BSRI is basically just a measure of measures of desirable instrumental and expressive traits. An investigation of both the content and the process validity of BSRI scores conducted by Myers and Gonda (1982) failed to provide support for either type of validity and argued that "although persons may be aware of stereotypic sex differences, they do not necessarily evaluate themselves in terms of some 'widely known' stereotype when they fill out questionnaires such as the BSRI" (p. 317). Whether the BSRI

successfully discriminates between individuals who adhere to sex role stereotypes and those who do not, construct validity cannot be adequately assessed as long as there are inconsistencies in Bem's accounts of what the BSRI is intended to measure.

A second critique is based on the desirability and perceptions of masculine and feminine traits. Three hundred and seventy-one undergraduates were first asked to complete the BSRI as a self-report and then asked to go through a listing of the BSRI items and rate each of the 60 items as feminine, masculine, or neutral (Hoffman, 2001). The assessment of perceptions of femininity and masculinity using the BSRI items revealed that college undergraduates in this study perceived BSRI items very differently from the gender-stereotypical way that the 1970s college undergraduates viewed these items when first testing the BSRI as a measurement of gender. The way masculinity and femininity is viewed has changed and give further cause to doubt the current theoretical meaningfulness of how the BSRI scale scores are interpreted. If the items that constitute the BSRI Masculinity scale are no longer considered masculine and the items on the BSRI Femininity scale are no longer considered feminine, then the basis for classifying individuals in such terms is eroded. Hoffman's (2001) study suggests that gender schema theory (Bem, 1981), which relied on cultural definitions of masculinity and femininity as a framework for one's organization of information about self and others, may be less relevant than before.

These critiques have led researchers to search for a more valid instrument for measuring gender identity. Since the development of the BSRI, a number of instruments have been established in the hopes of providing a more valid and sensitive measure of gender identity by focusing separately on male and female roles and norms. Such

instruments include the assessment of the degree to which individuals endorse traditional masculine norms (Male Role Norms Scale; Thompson & Pleck, 1986), attitudes (Male Roles Attitudes Scale; Pleck, Sonenstein, & Ku, 1993), masculinity in relationships (Adolescent Masculinity in Relationships Scale; Chu, Porche, & Tolman, 2005), role adherence (Male Role Norms Inventory; Levant, Hirsch, Celantano, & Cozza, 1992) and conformity to male roles (Conformity to Male Norms Inventory; Mahalik et al., 2003). Regarding femininity, measurements of feminine ideology (Femininity Ideology Scale; Levant, Richmond, Cook, House, & Aupont, 2007), role adherence (Conformity to Feminine Norms Inventory; Mahalik et al., 2005) and identity (Feminist Identity Development Scale; Bargad & Hyde, 1991; Feminist Identity Composite; Fischer et al., 2000) have also been created. However, a review of these measurements has elicited many of the same criticisms as the BSRI, namely, their construct validities (Chu et al., 2005; Levant et al., 2007). Behaviors, beliefs and traits are feminine versus masculine remain inconsistently defined (Best & Williams, 1998; Gilmore, 1990; Herdt, 1994; Levant et al., 2003; Spence & Helmreich, 1978), scales demonstrate low levels of internal consistency (Smiler & Epstein, 2010).

Regardless of the which instrument is used, femininity and masculinity remain sociocultural as well as psychological constructs that are always subject to change. While the BSRI remains the most common measurement of gender, newer theories and approaches that explore masculinity and femininity as representations of gender self-concept, gender identity, and gender role conformity provide a different lens for viewing these hard to define constructs. Future research is needed to investigate these possibilities and how they might affect humor preferences.

Limitations and Future Directions

Possible limitations of this specific study are that although 352 individuals participated in this study, most participants were young heterosexual female students between the ages of 18-25. Limited distribution within this studies sample size resulted in an unrepresentative sample and therefore cannot be generalized to the target population. There were also 129 more female participants than males which led to an imbalanced and uneven distribution in male scores. Results demonstrated that participants recruited from SONA were from a younger age range (males, 18-36; females, 18-45) than those recruited via Facebook (males 21-47; females, 18-62). Future research should seek to include a larger age range of adult participants, as young adults may differ in the importance they place on certain traits and humor preferences than older adults. It should also seek to include a more evenly distribution of males and females of all ages to achieve a more representative sample that better represents the population as a whole. It is important that each gender is represented equally to avoid skewing results.

An important factor to include, that was mentioned in the literary review but not included in the current study, is an individual's relationship status and level of satisfaction within their relationship. Women seem to value and initiate humor more frequently with a romantic partner if they were in a satisfactory long-term relationship (Li et al., 2006). There is also a relationship between level of commitment and length of relationship with importance of humor production (McGee, 2009). Past research has demonstrated that as the levels of commitment and length of relationship increased so did the perceived importance of humor production in both men and women, (McGee, 2009). An examination of the importance of humor that includes individuals in different types of

relationships (i.e. dating versus long term) in men and women could provide further explanation to why the results of the current study were achieved. Including relationship status would allow for the clarification and separation of those individuals who may not be in a relationship or even seeking one. If being in a long-term relationship effects the importance of humor production and appreciation, then it would be of value to know how those without a partner and/or the desire to be in a relationship would affect such preferences. For those in relationships, studying the ways humor may be used in indicating interest in the initiation of new relationships (romantic or otherwise) versus maintaining existing ones would provide a closer examination in the underlying function of humor in mate selection and personal attraction.

It is also important to examine other socially-derived factors that may play a role in influencing humor preferences. This study was based on past literature that examined the relationship between biological sex and humor preferences (Bressler et al., 2005; 2006), with a minimal amount of research into gender identity (Brodzinsky & Rightmyer, 1980; Brodzninsky Rubien, 1976). However sexual orientation has also been associated with levels of masculinity/femininity (Lippa et al., 1997) and mate-desirability rankings of such traits like humor and physical attractiveness (Lippa et al., 2007). An individual's sexual orientation could be an influencing factor and/or predictor in humor preferences, but evolutionary theories of humor have only theorized about differences in humor preferences between heterosexual men and women. For example, most people seem to value personal traits such as intelligence, dependability, emotional stability, honesty, a sense of humor, and warmth in a partner; however, men and women differ in the relative importance they assign to specific traits (Buss & Barnes, 1986; Hill, 1945; Hudson &

Henze, 1969; Hoyt & Hudson, 1981; McGinnis, 1958; Powers, 1971). An examination of 462,859 completed internet surveys taken between February and May of 2005 by the British Broadcasting Corporation (BBC) along with several researchers, (Lippa et al., 2007) found that sex-based differences among the desired personality traits in mate selection varied according to sexual orientation. Regardless of sexual orientation, humor was ranked third in terms of overall importance in men and as the number one trait among all women. After accounting for sexual orientation, heterosexual men ranked humor as slightly more important than homosexual men, while no significant differences were found between heterosexual and homosexual women.

These results suggest that cultural factors like sexual orientation have an impact on men's and women's rankings of character traits such as humor (Lippa et al., 2007). It should be of interest to study humor preferences in homosexual as well as in heterosexual individuals in order to enrich our understanding of the ways in which sexual orientation is linked to other kinds of gender-related behaviors. Research has shown that sexual orientation is associated with a complex array of gender-related traits and behaviors in both men and women (Lippa, 2005b; Wilson & Rahman, 2005). Same-sex heterosexual and homosexual individuals have been found to differ on a variety of sex-linked physical traits, personality characteristics, and cognitive abilities (Bailey et al., 1994; Kenrick et al., 1995); therefore, it is possible that the importance of humor production and appreciation in mate selection is influenced by sexuality as well as biological sex. Further examination is necessary to determine whether homosexual individuals conform to the theorized preferences of their sex (humor vs. production), or if their sexual orientation influences the way they appreciate and value humor in a potential mate.

It should also be mentioned that the current study only looked at self-report. Future research may want examine participants “appreciate” (e.g., rate humor) versus “produce” (make jokes/captions) instead of relying on what individuals said they would prefer. This would decrease the potential for bias and distortion that comes with self-report studies and allow for a closer examination into humor appreciation and production. Humor appreciation could be measured by having participants rate a series of one liner jokes, cartoons or even comedy clips. It may also be beneficial to study individuals who perform standup comedy or participate in comedic roles to further examine humor production.

Another way to further inform the results of this study would be to add neuroimaging. Previous studies on mate selection have shown that both men and women prefer someone with a “good sense of humor”, however their interpretations on what constitutes as a good sense of humor seem to differ (Bressler, Martin, & Balshine, 2005). The theory that men have been shown to be attracted to those who laugh at their jokes, whereas women prefer a partner that makes them laugh has been frequently examined and replicated (Bressler, Martin, & Balshine, 2005). Therefore, researchers have since suggested that, in order to adhere to these preferences of humor production and appreciation, the brains of men and women may have evolved in such a way that men are better able to produce humor while women are more equipped to evaluate (Miller, 2000). This ability to produce and appreciate humor may be similar to other sexually selective traits in that there may be an underlying genetic or neural component that over time has developed in such a way as to help pass this positive trait along (Darwin, 1871).

Differentiation in the neurocircuitry of humor appreciation has been observed in

children as young as six years of age and has assisted in the understanding of the developmental origins of sex based differences in adult brain functions (Vrticka, Neely, Shelly, Black, & Reiss, 2013). Vrticka et al., (2013) focused on the neural processing of humor appreciation in twenty-two normally developing children. Out of the twenty-two children, there were eight opposite sex sibling pairs, which did allow for some genetic and environmental control. Each child was shown video clips previously rated as either funny, positive or neutral in which each stimulus category was shown thirty-two times. After every clip the child was asked to indicate whether they liked or did not like the clip as well as rate each clip from 1 = least funny to 8 = most funny. Data was collected via fMRI scans and when compared revealed stronger activation in the right supramarginal gyrus, amygdala and ventromedial cortex in female participants than in men. The right supramarginal gyrus has been linked to emotional responses and empathic behavior as damage to this area seems to decrease a person's ability to perceive the emotions of others and affects their ability to show empathy towards other people (Silani, Lamn, Ruff & Singer, 2013). The amygdala and ventromedial cortex also play a crucial role in the processing and expression of emotions as well as serve and enable the formation of stimulus – reinforcement associations (Blair, 2008). From an evolutionary perspective, it could be suggested that these areas become more active in females in order to increase their ability to process and appreciate humor emotionally and therefore reinforcing its importance and desirability from potential partners.

These sex differences in the neural mechanisms of humor appreciation start early in child development and continue throughout adulthood. Using blood oxygenation level dependent (BOLD) contrasts with high-field (3T) functional magnetic resonance imaging

(fMR), Kohn, Kellermann, Gur, Schneider, & Habel, (2011) examined 29 individuals (14 female, 15 male) during the processing of humorous cartoons. In women, the ventral system, responsible in the detection and appraisal of emotion was activated, including amygdala, insula, and Anterior Cingulate Cortex (ACC). Men showed activation in both the ventral and dorsal processing systems. The results indicated that women process humor through limbic reactivity, involving appraisal of its emotional features, while men apply more evaluative, executive resources to humor processing (Kohn., et al, 2011).

It is apparent that there are sex based differences in the neural correlates of humor processing and that these differences, although biologically based are also influenced by societal factors. Future research into the humor preferences of both heterosexual and homosexual men and women may benefit from the use of neural imaging to better understand these differences.

Summary and conclusions

Understanding the societal and biological factors that influence humor preferences and mate selection remains an area of interest within the scientific community. The abundance of research establishing biological sex based differences in heterosexual men and women regarding the value of humor production and appreciation have only just begun to scratch the surface in how the interrelationship between genetics and environment contribute to the production, evaluation and importance of humor. This study sought to bridge the gaps in understanding how biological sex, gender identity and humor preference are interrelated. Although gender identity was not found to mediate the relationship between sex and humor preference, this study was able to confirm biological sex as a significant influence on the value that men and women place on humor

production and appreciation. Overall, the results of this study, reinforce findings of sex based differences in humor preferences and how this relationship may be changing as a result of a lack of acceptance and adherence to typical gender roles, norms and stereotypical traits associated with either sex. Most importantly, this research provides the basis for future studies and a number of questions and variables that could inform future explorations in the examination of sex differences in humor production and appreciation.

APPENDIX SECTION

Appendix A.

Consent Statement

The purpose of this research is to explore possible relationships between gender, sexual orientation and selection of partner based on humor preference. You will be asked to answer questions about your behaviors and beliefs. You are encouraged to answer all questions honestly and completely; however, you are free to withhold answers to questions that you don't feel comfortable answering or withdraw your consent to participate at any point. If you decide to stop participating, your standing with the university and/or your instructor will not be compromised. However, you will not receive compensation for participating. This survey should take no more than 10 minutes and you will receive 1 extra credit points for participating. Completing this survey poses no risk beyond what you would encounter in your everyday life, and may benefit you by helping you understand what some psychological researchers are interested in. Your responses to the questions on this survey will be kept anonymous. We will keep a record of your participation to enable us to give compensation, but your answers will not be associated with your identity. This research is not funded by any organizations or institutions outside of Texas State University.

This research is being supervised by Dr. Reiko Graham. If you have questions about this research, Dr. Graham can be reached via email at rg30@txstate.edu, or by phone at (512) 245-6806

This project 2016S95 was approved by the Texas State IRB on 8/3/2016. Pertinent questions of concerns about the research participants' rights and/or research related injuries to participants should be directed to the IRB chair, Dr. Jon Lasser 512-245-3413 – (lasser@txstate.edu) or to Monica Gonzales, IRB Regulatory Manager 512-245-2334 – (meg201@txstate.edu).

Appendix B.

Source: Bressler et al's. (2006)

Humor Production

1. It doesn't matter to me whether the person I am dating can make me laugh.
2. If someone cannot make me laugh, I am not interested in him/her as a relationship partner.
3. All of the people that I have dated were people who were very good at making me laugh
4. If I do not think the person I am dating is funny, I lose interest in him/her.

Humor Receptivity

5. I don't care whether the person I am dating thinks I am funny or not.
6. All of the people that I have had or wanted relationships with were especially good at appreciating my sense of humor.
7. If I were dating someone who didn't enjoy my sense of humor, I would be very likely to end the relationship.
8. It is very important to me that the person I am dating appreciates my sense of humor.

Appendix C

Source: Bem (1974)

Bem Androgyny Test

Answer the questions as the term best fits you according to the following scale:

- 1 = Never or almost never true
- 2 = Usually not true
- 3 = Sometimes but infrequently true
- 4 = Occasionally true
- 5 = Often true
- 6 = Usually true
- 7 = Always or almost always true

Questions:

- | | | |
|-----------------------------------|-------------------------------|------------------------|
| 1. Acts as a Leader | 22. Inefficient | 43. Masculine |
| 2. Adaptable | 23. Defends own beliefs | 44. Solemn |
| 3. Affectionate | 24. Flatterable | 45. Soft-spoken |
| 4. Conceited | 25. Dominant | 46. Tactful |
| 5. Aggressive | 26. Jealous | 47. Self-reliant |
| 6. Cheerful | 27. Gentle | 48. Sympathetic |
| 7. Ambitious | 28. Likable | 49. Self-sufficient |
| 8. Conscientious | 29. Forceful | 50. Theatrical |
| 9. Childlike | 30. Gullible | 51. Tender |
| 10. Conventional | 31. Has leadership abilities | 52. Truthful |
| 11. Analytical | 32. Moody | 53. Strong personality |
| 12. Compassionate | 33. Loves children | 54. Understanding |
| 13. Assertive | 34. Reliable | 55. Will take a stand |
| 14. Friendly | 35. Independent | 56. Unpredictable |
| 15. Doesn't use harsh language | 36. Loyal | 57. Warm |
| 16. Happy | 37. Individualistic | 58. Unsystematic |
| 17. Athletic | 38. Secretive | 59. Will take risks |
| 18. Eager to soothe hurt feelings | 39. Sensitive to others needs | 60. Yielding |
| 19. Competitive | 40. Sincere | |
| 20. Helpful | 41. Makes decisions easily | |
| 21. Feminine | 42. Shy | |

Answers:

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

7. _____ 8. _____ 9. _____ 10. _____ 11. _____ 12. _____
 13. _____ 14. _____ 15. _____ 16. _____ 17. _____ 18. _____
 19. _____ 20. _____ 21. _____ 22. _____ 23. _____ 24. _____
 25. _____ 26. _____ 27. _____ 28. _____ 29. _____ 30. _____
 31. _____ 32. _____ 33. _____ 34. _____ 35. _____ 36. _____
 37. _____ 38. _____ 39. _____ 40. _____ 41. _____ 42. _____
 43. _____ 44. _____ 45. _____ 46. _____ 47. _____ 48. _____
 49. _____ 50. _____ 51. _____ 52. _____ 53. _____ 54. _____
 55. _____ 56. _____ 57. _____ 58. _____ 59. _____ 60. _____

Column totals: (Add up the values in each of the six columns.)

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

Masculine traits: _____ Add column 1 to column 5.

Feminine traits: _____ Add column 3 to column 6.

Bem score: _____ Subtract Feminine traits from Masculine traits.

Masculine traits - Feminine traits = Bem score.

Compare Bem score to the androgyny scale below.

Androgyny scale:

Masculine	> +20
Nearly Masculine	+10 to +19
Androgynous	+ 9 to - 9
Nearly feminine	-10 to -19
Feminine	< -20

Columns 1 and 5 are the "Masculine" traits.
 Columns 3 and 6 are the "Feminine" traits.
 Columns 2 and 4 are the "Neutral" traits

LITERATURE CITED

- Alain, M. (1987). A French version of the Bem sex-role inventory. *Psychological Reports, 61*(2), 673-674.
- Bailey, J. M., Gaulin, S., Agyei, Y., & Gladue, B. A. (1994). Effects of gender and sexual orientation on evolutionarily relevant aspects of human mating psychology. *Journal of Personality and Social Psychology, 66*, 1081–1093.
- Bargad, A., & Hyde, J. S. (1991). Women's studies: A study of feminist identity development in women. *Psychology of Women Quarterly, 15*, 181–201
- Bem, S. (1974). The psychological measurement of androgyny. *Journal of Consulting and Clinical Psychology, 42*, 155–162.
- Bem, S. L. (1975). Sex-role adaptability: One consequence of psychological androgyny. *Journal of Personality and Social Psychology, 31*, 634-643.
- Bem, S. L. (1977). On the utility of alternative procedures for assessing psychological androgyny. *Journal of Consulting and Clinical Psychology, 45*, 196-205.
- Bem, S. L. (1981). *Bern Sex-Role Inventory: Professional manual*. Palo Alto, CA: Consulting Psychologists Press.
- Bem, S. L., & Lenney, E. (1976). Sex typing and the avoidance of cross-sex behavior. *Journal of Personality and Social Psychology, 33*, 48-54.
- Bein, S. L., Martyna, W., & Watson, C. (1976). Sex typing and androgyny: Further explorations of the expressive domain. *Journal of Personality and Social Psychology, 34*, 1016-1023.

- Best, D. L., & Williams, J. E. (1998). Masculinity and femininity in the self and ideal self descriptors of university students in fourteen countries. In G. Hofstede (Ed.), *Masculinity and femininity: The taboo dimension of national cultures* (106–116). Thousand Oaks, CA: Sage.
- Brannon, R. (1978). Measuring attitudes (toward women and otherwise). In J. Sherman & F. Denmark (Eds.), *The psychology of women: Future directions in research* (647-731). New York: Psychological Dimensions.
- Bledsoe, J. C. (1983). Factorial validity of the Bem sex-role inventory. *Perceptual and Motor Skills*, 56(1), 55–58.
- Bressler, E. R., Martin, R.A., & Balshine. (2006). Production and appreciation of humor as sexually selected traits. *Evolution and Human Behavior*, 27, no. 2: 121-130.
- Bressler, E. R., & Balshine, S. (2006). The influence of humor on desirability. *Evolution and Human Behavior*, 27(1), 29-39.
- Brodzinsky, D. M., Barnet, K., & Aiello, J. R. (1981). Sex of subject and gender identity as factors in humor appreciation. *Sex Roles*, 7(5), 561-573.
- Brodzinsky, D. M., Rightmyer, J (1980). Individual differences in children's humor development. *Journal of Consulting and Clinical Psychology*
- Brodzinsky, D. M., Rubien, J (1976). Humor production as a function of sex subject, creativity and cartoon content. *Journal of Consulting and Clinical Psychology* 44, 597-600.
- Buss, D. M., & Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology*, 50, 559–570.

- Carver, L. F., Vafaei, A., Guerra, R., Freire, A., & Phillips, S. P. (2013). Gender differences: Examination of the 12-item Bem sex role inventory (BSRI-12) in an older Brazilian population. *PLoS ONE*, 8(10), e76356.
- Chu, J. Y., Porche, M. V., & Tolman, D. L. (2005). The adolescent masculinity ideology in relationships scale: Development and validation of a new measure for boys. *Men and Masculinities*, 8, 93–115.
- Darwin, C. (1871). *The descent of man, and selection in relation to sex*. Princeton, NJ: Princeton University Press.
- Donnelly, K., & Twenge, J. M. (2016). Masculine and feminine traits on the Bem sex-role inventory, 1993–2012: A cross-temporal meta-analysis. *Sex Roles*.
- Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, 54, 408–423.
- Edwards, A. L., & Ashworth, C. 11. (1977). A replication study of item selection for the Bem Sex-Role Inventory. *Applied Psychological Measurement*, 1, 501-507
- Feather, N. T. (1978). Factor structure of the Bem sex-role inventory: Implications for the study of masculinity, femininity, and androgyny. *Australian Journal of Psychology*, 30, 241-254.
- Feingold, A. (1992). Good-looking people are not what we think. *Psychological Bulletin*, 111(2), 304-341.
- Fischer, A. R., Tokar, D. M., Mergl, M. M., Good, G. E., Hill, M. S., & Blum, S. A. (2000). Assessing women's feminist identity development: Studies of convergent, discriminant, and structural validity. *Psychology of Women Quarterly*, 24, 15–29.

- Fontayne, P., Sarrazin, P., & Famose, J.-P. (2000). The Bem sex-role inventory: validation of a short version for French teenagers. *European review of applied psychology, Revue European de Psychologie Appliqué*, 50(4), 405–416.
- Gale-Ross, R., Baird, A., & Towson, S. (2009). Gender role, life satisfaction, and wellness: Androgyny in a southwestern Ontario sample. *Canadian Journal on Aging*, 28(2), 135–146.
- Gilmore, D. D. (1990). *Manhood in the making: Cultural concepts of masculinity*. New Haven, CT: Yale University Press
- Greengross, G., & Miller, G. (2011). Humor ability reveals intelligence, predicts mating success, and is higher in males. *Intelligence*, 39(4), 188-192.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: a regression-based approach*. Retrieved from <http://afhayes.com/introduction-to-mediation-moderation-and-conditional-process-analysis.html>
- Herd, G. (Ed.). (1994). *Third sex, third gender: Beyond sexual dimorphism in culture and history*. New York: Zone Books.
- Helmreich, R. L., Spence, J. T., & Wilhelm, J. A. (1981). A psychometric analysis of the personal attributes questionnaire. *Sex Roles*, 7, 1097–1108
- Hoffman, R. M., & Borders, L. D. (2001). Twenty-five years after the Bem sex-role inventory: A reassessment and new issues regarding classification variability. *Measurement and Evaluation in Counseling and Development*, 34(1), 39-55.

- Hone, L. S., Hurwitz, W., & Lieberman, D. (2015). Sex differences in preferences for humor: A Replication, modification, and extension. *Evolutionary Psychology, 13*(1).
- Hooper, J., Sharpe, D., & Roberts, S. G. (2016). Are men funnier than women, or do we just think they are? *Translational Issues in Psychological Science, 2*(1), 54-62.
- Katsurada, E., & Sugihara, Y. (1999). A preliminary validation of the Bem sex role inventory in Japanese culture. *Journal of Cross-Cultural Psychology, 30*(5), 641–645.
- Kohn, N., Kellermann, T., Gur, R., Schneider, F., & Habel, U. (2011). Gender differences in the neural correlates of humor processing: Implications for different processing modes. *Neuropsychologia, 49*(5), 888-897.
- Levant, R. F., Hirsch, L. S., Celentano, E., & Cozza, T. M. (1992). The male role: An investigation of contemporary norms. *Journal of Mental Health Counseling, 14*, 325–337.
- Levant, R. F., Richmond, K., Majors, R. G., Inclan, J. E., Rossello, J. M., Heesacker, M., et al. (2003). A multicultural investigation of masculinity ideology and alexithymia. *Psychology of Men & Masculinity, 4*, 91–99.
- Levant, R., Richmond, K., Cook, S., House, A. T., & Aupont, M. (2007). The femininity ideology scale: Factor structure, reliability, convergent and discriminant validity, and social contextual variation. *Sex Roles, 57*, 373–383
- Li, N. P., V. Griskevicius, K. M. Durante, P. K. Jonason, D. J. Pasisz, and K. Aumer (2009). An evolutionary perspective on humor: Sexual selection or interest indication? *Personality and Social Psychology Bulletin, 35*(7), 923-936.

- Lippa, R. A. (2007). The preferred traits of mates in a cross-national study of heterosexual and homosexual men and women: An examination of biological and cultural influences. *Archives of Sexual Behavior*, *36*(2), 193-208.
- Mahalik, J. R., Locke, B. D., Ludlow, L. H., Diemer, M. A., Scott, R. P. J., Gottfried, M., et al. (2003). Development of the conformity to masculine norms inventory. *Psychology of Men & Masculinity*, *4*, 3–25.
- Mahalik, J. R., Morray, E. B., Coonerty-Femiano, A., Ludlow, L. H., Slattery, S. M., & Smiler, A. (2005). Development of the conformity to feminine norms inventory. *Sex Roles*, *52*, 417–435.
- Martin, C. L. (1990). Attitudes and expectations about children with nontraditional and traditional gender roles. *Sex Roles*, *22*, 151–165.
- Martin, R. A. (2007). *The psychology of humor: An integrative approach*. Burlington, MA: Elsevier Academic Press.
- Mateo, M., & Fernandez, J. (1991). La dimensionalidad de los conceptos de masculinidad y feminidad. *Investigaciones Psicológicas*, *9*, 95–116.
- Mickes, L., Walker, D. E., Parris, J. L., Mankoff, R., & Christenfeld, N. J. (2011). Who's funny: Gender stereotypes, humor production, and memory bias. *Psychonomic Bulletin & Review*, *19*(1), 108-112.
- Miller, G.F. (2000). *The mating mind*. New York: Random House
- McGee, E., Shelvin, M. (2009) Effect of Humor on Interpersonal Attraction and Mate Selection. *The Journal of Psychology*, *143*(1), 67-77.

- Moreland, J. R., Gulanick, N., Montague, E. K., & bIarren, V. A. (1978). Some psychometric properties of the Bem Sex-Role Inventory. *Applied Psychological Measurement, 2*, 249- 256.
- Multicollinearity: Definition, Causes, Examples. (2017, October 24). Retrieved from <http://www.statisticshowto.com/multicollinearity/>
- Myers, A. M., & Gonda, G. (1982). Empirical validation of the Bem sex-role inventory. *Journal of Personality and Social Psychology, 43*, 304-318.
- Ozkan, T., & Lajunen, T. (2005). Masculinity, femininity, and the Bem sex role inventory in Turkey. *Sex Roles, 52*(1-2), 103–110.
- Payne. F. Do (1085). Review of Bem Sex-Role inventory. In S. Vo Mitrhell (Ed.). *The Ninth mental measurements yearbook, 1*(78—179). Lincoln, NE: Buros Institute of Mental Measurements.
- Pedhazur, E. J., & Tetenbaum, T. J. (1979). Bem Sex Role Inventory: A theoretical and methodological critique. *Journal of Personality and Social Psychology, 37*(6), 996-1016.
- Pleck, J. H., Sonenstein, F. L., & Ku, L. C. (1993). Masculinity ideology and its correlates. In S. Oskamp & M. Costanzo (Eds.), *Gender issues in contemporary society* (85–110). Thousand Oaks, CA: Sage
- Smiler A.P., Epstein M. (2010) Measuring Gender: Options and Issues. In: Chrisler J., McCreary D. (Eds) *Handbook of Gender Research in Psychology*. Springer, New York, NY

- Spence, J. T., Helmreich, R. L., & Stapp, J. (1974). The Personal Attributes Questionnaire: A measure of sex-role stereotypes and masculinity-femininity. *JSAS Catalog of Selected Documents in Psychology*, 4, 43-44.
- Spence, J. T., & Helmreich, R. L. (1978). *Masculinity and femininity: Their psychological dimensions, correlates, and antecedents*. Austin, TX: University of Texas Press.
- Spence, J. T., & Helmreich, R. L. (1981). Androgyny versus gender schema: A comment on Bem's gender schema theory. *Psychological Review*, 88, 365-368.
- Spence, J. T. (1984) Masculinity, femininity, and gender-related traits: A conceptual analysis and critique of current research. B. A. Maher & WcB. Maher (Eds.). *Progress in experimental research in personality* (35) (1-97). New York: Academic Press.
- Spence, J. T. (1985). Gender identity and its implications for the concepts of masculinity and femininity. In T. B. Sonderegger (Ed.), *Nebraska Symposium on Motivation: psychology of gender* (59-96). Lincoln, NE: University of Nebraska Press.
- Spence, J. T. (1991). Do the BSRI and PAQ measure the same different concepts? *Psychology of Women Quarterly*, 141
- Sprecher, S., Sullivan, Q., & Hatfield, E. (1994). Mate selection preferences: Gender differences examined in a national sample. *Journal of Personality and Social Psychology*, 66(6), 1074-1080.

- Sprecher, S., & Regan, P. C. (2002). Liking some things (in some people) more than others: partner preferences in romantic relationships and friendships. *Journal of Social and Personal Relationships, 19*(4), 463-481.
- Streiner, D. L., & Norman, G. R. (2008). *Health Measurement Scales: A practical guide to their development and use*. Oxford: OUP
- Sugihara, Y., & Katsurada, E. (2000). Gender-role personality traits in Japanese culture. *Psychology of Women Quarterly, 24*(4), 309–318.
- Thompson, E. H., Jr., & Pleck, J. H. (1986). The structure of male role norms. *American Behavioral Scientist, 29*, 531–543.
- Walkup, H., & Abbott, R. D. (1978). Cross-validation of item selection on the Bem Sex-Role Inventory. *Applied Psychological Measurement, 2*, 63-71.
- Ward, C., & Sethi, R. R. (1986). Cross-cultural validation of the Bem Sex role inventory Malaysian and South Indian research. *Journal of Cross-Cultural Psychology, 17*(3), 300–314
- Waters, C. W., Waters, L. K., & Pincus, S. (1977). Factor analysis of masculine and feminine sex-typed item from the Bem Sex-Role Inventory. *Psychological Reports, 40*, 567-570.
- Wilbur, C. J., & Campbell, L. (2011). Humor in Romantic Contexts: Do Men Participate and Women Evaluate? *Personality and Social Psychology Bulletin, 37*(7), 918-929.
- Wilcox, C., & Francis, L. J. (1997). Beyond gender stereotyping: Examining the validity of the Bem sex-role inventory among 16- to 19-year old females in England. *Personality and Individual Differences, 23*(1), 9–13.

Windle, M., & Sinnott, J. D. (1985). A psychometric study of the Bem Sex Role

Inventory with an older adult sample. *Journal of Gerontology*, 40(3), 336–343.

Zhang, J., Norvilitis, J. M., & Jin, S. (2001). Measuring gender orientation with the Bem

sex role inventory in Chinese culture. *Sex Roles*, 44(3-4), 237–251.