

MAN, THAT'S FUNNY

MAN, THAT'S FUNNY: THE EVOLVED FUNCTION OF AGGRESSIVE HUMOR

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Abstract

Aggressive humor is humor that reflects an intention to ridicule and insult others. Previous studies found that the use of aggressive humor tends to damage interpersonal relationships and associates with traits typically considered socially undesirable. However, the use of aggressive humor is prevalent, so much so that it is considered one of four major types of humor alongside affiliative, self-enhancing, and self-defeating humor. These findings present an evolutionary puzzle: why has nature preserved a seemingly maladaptive behavior such as aggressive humor?

In this thesis, I offered an evolutionary, functional analysis of the use of aggressive humor, and my main argument is that similar to physical aggression and other types of verbal aggression, the use of aggressive humor facilitates intrasexual competition. I conducted a cross-sectional survey ($N = 400$ U.S. adults) to test this intrasexual-competition hypothesis of aggressive humor, and the findings are threefold. First, male respondents, on average, scored significantly higher than female respondents on a self-report measure of the use of aggressive humor, replicating the findings of prior research. Second, a measure of intrasexual-competition (but not courtship) motive positively and significantly correlated with the self-report measure of the tendency to use aggressive humor. This correlation remained significant after I controlled for covariates related to the mating effort and aggression but dropped to non-significance after I controlled for the Dark Triad personality traits. Third, there was no evidence that respondents' sex moderated the correlation between the motive to intrasexually compete and the tendency to use aggressive humor. Collectively, these findings largely support the hypothesis that the use of aggressive humor is related to intrasexual competition, which could be why nature has preserved the use of aggressive humor despite its negative impact on interpersonal relationships.

Keywords: aggressive humor, interpersonal relationship, sexual selection, intrasexual competition, adaptationism

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Chapter 1: Introduction

According to Merriam-Webster (Merriam-Webster, n.d.), humor refers to “something that is or is designed to be comical or amusing.” Prior research found that, while humor generally fosters healthy interpersonal relationships (Cann & Matson, 2014), it sometimes produces just the opposite effect. In particular, aggressive humor, which intentionally teases, ridicules, disparages, and insults others (Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003), can cause unpleasant feelings in the intended audience or bystanders (Bjerke & Rones, 2017; Martin et al., 2003; Prerost, 1995; Zeigler-Hill, Besser, & Jett, 2013). An example of aggressive humor is, “Yo’ mama is so fat when she fell, I did not laugh, but the sidewalk cracked up.” This joke is supposed to be funny by exaggerating the impact of a person falling, and it is aggressive because it insults overweight people and a person’s mother.¹ However, despite the apparent negative effects of aggressive humor on interpersonal relationships, aggressive humor is commonly observed (e.g., “Yo’ mama” jokes, *Comedy Central Roast*, and the White House correspondents dinner) and regarded as one of four major types of humor, alongside affiliative, self-enhancing, and self-defeating humor (Martin et al., 2003). The existence of aggressive humor presents an evolutionary puzzle: why has nature preserved this seemingly maladaptive behavior?

According to evolutionary psychology (Cosmides, Tooby, & Barkow, 1992), a costly behavior can be preserved by nature if the behavior provides compensatory benefits to an individual’s reproductive success. A relevant example would be aggressive behaviors, behaviors that are intended to inflict physical or psychological harm onto others (e.g., fist-fighting,

¹ There may be different types of aggressive humor, such as those that purposefully hurt people (e.g., the “Yo’ mama” jokes) and those that tease others to show affection. This thesis focuses on the former type of aggressive humor.

cursing). In the process of harming others, the aggressor themselves may also be injured and, with the possible exception of self-defense, often incurs third-party punishment (e.g., moral condemnation, incarceration). However, aggressive behaviors are observed in virtually all known human societies (Buss & Shackelford, 1997; Daly & Wilson, 1988) and many other animals (Archer, 1988; Huntingford & Turner, 1987). This is likely because aggressive behaviors can increase the aggressor's reproductive success by excluding others from accessing scarce, fitness-enhancing resources (e.g., food, shelter, mates; Archer, 1988; Huntingford & Turner, 1987). Aggressive behaviors—especially physical and verbal aggression—are more common in men than in women because men, compared to women, on average face more intense intrasexual competition (i.e., competition with same-sex others; Puts, 2010). Thus, being relatively high in aggressiveness (compared to women) is an adaptation rather than a problem of men that facilitates intrasexual competition (Archer, 2009; Buss & Shackelford, 1997; Daly & Wilson, 1988).

In this thesis, I argue that the use of aggressive humor is amenable to the same evolutionary analysis on aggression as outlined above. This argument is based on two facts about aggressive humor. First, aggressive humor teases, ridicules, disparages, and insults others (Martin et al., 2003; see above), all of which are consistent with definitions of verbal aggression (Buss & Perry, 1992) and may instigate physical aggression. Second, prior research found that men compared with women are generally more likely to use aggressive humor (Dyck & Holtzman, 2013; Martin et al., 2003; Mauriello & McConatha, 2007; Shuster, 2012; Sirigatti, Penzo, Gianetti, & Stefanile, 2014; Wu, Lin, & Chen, 2016). This sex difference likely reflects the asymmetric selection pressure on ancestral human males and females to intrasexually compete, which has also likely been selected for the sex differences in physical and verbal

aggression (see above).

In what follows, I first review prior research on the correlates of the use of aggressive humor, followed by a review of an evolutionary analysis of aggression. Next, I state the hypothesis regarding the evolved function of using aggressive humor and describing the findings from a cross-sectional survey that tested this hypothesis. I conclude this thesis by discussing the implications and limitations of the current findings.

Chapter 2: Prior Research on the Use of Aggressive Humor

2.1 Correlates of the Use of Aggressive Humor

Martin et al. (2003) laid much of the foundation for a systematic investigation of the affective, cognitive, and personality correlations of the likelihood of using different styles of humor. Martin et al. extended prior theory, which mostly considered benign humor (e.g., affiliative and self-enhancing humor), by recognizing the prevalence of seemingly maladaptive humor (e.g., aggressive and self-defeating humor). Martin et al. also developed the Humor Style Questionnaire (“HSQ”) to assess people’s self-reported tendency to use affiliative, aggressive, self-enhancing, and self-defeating humor. HSQ consists of 32 items that are evenly distributed across the four types of humor (i.e., eight items per type). Items include: “I enjoy making people laugh” (i.e., the use of *affiliative humor*), “My humorous outlook on life keeps me from getting overly upset or depressed about things” (i.e., the use of *self-enhancing humor*), “If I don’t like someone, I often use humor or teasing to put them down.” (i.e., the use of *aggressive humor*), and “I let people laugh at me or make fun at my expense more than I should” (i.e., the use of *self-defeating humor*). Martin et al. found that all four subscales of the HSQ showed satisfactory internal consistency (e.g., Cronbach’s α ranged from 0.77 to 0.81) and adequate construct validity. For example, Martin et al. found that participants who scored higher on the four subscales were generally rated by their dating partners as more humorous. Further, the subscales on affiliative and self-enhancing humor positively correlated with existing humor scales (e.g., the Situational Humor Response Questionnaire and the Sense of Humor Questionnaire), which mostly measure benign uses of humor, whereas the subscale on the use of aggressive humor positively correlated with trait aggression measured by the Buss-Perry Aggression Questionnaire

(Buss & Perry, 1992).

Subsequent research using the HSQ found that the use of aggressive humor negatively correlated with traits that are typically considered desirable. These traits include lower levels of 1) agreeableness, 2) conscientiousness, 3) self-esteem, 4) subjective happiness, 5) femininity, 6) social competence, 7) empathy, 8) perspective taking, 9) emotionality, 10) honesty-humility, 11) socially desirable, 12) forgiveness likelihood (for citations, see Table 1). At the same time, the use of aggressive humor as measured by the HSQ has been found to correlate positively with traits that are typically considered undesirable. These traits include higher levels of 1) neuroticism, 2) subclinical psychopathy, 3) Machiavellianism, 4) depression, 5) social avoidance, 6) anxiety, 7) physical aggression, 8) verbal aggression, 9) anger, 10) hostility (for citations, see Table 1). Table 1 is not intended to provide an exhaustive list of prior studies on aggressive humor because that body of research is too large for a comprehensive review.² However, the studies listed in Table 1 drew on diverse samples (including undergraduate students, adults from local communities, and Internet users) of adequate sizes (ranging between 96 and 1,195) from 11 countries and world regions. Thus, the findings reviewed above should be representative of the kinds of trait variables that correlate with the use of aggressive humor.

2.2 Sex Difference in the Use of Aggressive Humor

A consistent finding from prior research is that men are generally more likely than women to use aggressive humor. For example, Martin et al. (2003) surveyed 1,195 United States Adults (60.6% females) using the HSQ. They found that, on average, male respondents scored significantly higher than female respondents on the aggressive-humor subscale (32.3 versus 26.3

² A search using “aggressive humor” returned 240,000 hits in Google Scholar as of December 2, 2020.

out of 56 points, $SD = 8.55$ and 8.05). Note that, while the male respondents in Martin et al. (2003) on average also scored higher than female respondents on the other three subscales, the sex difference in the use of aggressive humor was descriptively the largest. Specifically, Cohen's d was estimated 0.72 compared to 0.19 , 0.13 , and 0.36 for the sex differences in the use of aggressive, affiliative, self-enhancing, and self-defeating humor. Dyck and Holtzman (2013) surveyed 826 Canadian young adults (65.3% females) and found that male respondents, on average, scored significantly higher than female respondents on the use of aggressive humor (Cohen's $d = 0.59$). In comparison, the sex differences in the use of the other three types of humor were not statistically significant. Sirigatti et al. (2014) surveyed 203 Italian high schoolers and undergraduates (87.7% females) and found that, again, male respondents on average scored significantly higher than females on the use of aggressive humor (Cohen's $d = 0.50$). Lastly, Wu et al. (2016) surveyed 431 Taiwanese high schoolers (54.8% females) and found that male respondents, on average, scored significantly higher than females on the use of aggressive humor (Cohen's $d = 0.33$). For more evidence on men generally being more likely to use aggressive humor, see Prerost (1995) and Shuster (2012). In sum, prior studies on North Americans, Europeans, and Southeast Asians all found that men are generally more likely to use aggressive humor than women with small to medium effect sizes.

Chapter 3: An Evolutionary Functional Analysis of Aggression

3.1 The Theories of Evolution by Natural and Sexual Selection

Darwin (1859) predicted that “In the distant future I see open fields for far more important research. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation” (p. 488). Darwin was correct. A little more than 160 years later, the field of evolutionary psychology (Buss, 2015; Gaulin & McBurney, 2004; Cosmides, Tooby, & Barkow 1992) has formed exactly to “discover and understand the design of the human mind” (Cosmides & Tooby, 1997, para.1) by drawing on the modern synthesis of Darwin’s theories of evolution by natural (1859) and sexual selection (1871).

Briefly, the theory of evolution by natural selection starts with a pair of seemingly contradictory observations. First, the population size of a species of animals typically grows exponentially, and this is true even for elephants, the slowest reproducing mammals on earth. However, population size tends to remain stable over time (e.g., across generations of the species in question). To reconcile these observations, Darwin (1859) reasoned that some individual members of the species must have failed to reproduce. Importantly, Darwin further argued that the cause of this *differential reproductive success* is that, by natural endowment, some individuals possess traits that increase individual survival and reproduction in a given ecology, whereas others do not possess those traits or possess traits that undermine individual survival and reproduction in the given ecology. Those traits that indirectly increase an individual’s reproductive success are called adaptations (Williams, 2018). Through the hereditary mechanism elucidated by modern molecular biology (e.g., the double helix structure of DNA), individuals

pass the genes that code for those adaptations to their offspring, and, over generational time, those adaptations are populated and fixated in the population.

The theory of evolution by sexual selection complements the theory of evolution by natural selection by explaining the existence of a special kind of traits, namely handicap traits (Zahavi, 1975; e.g., peacocks' tails, red deer stags' antlers). The existence of these traits is puzzling because they do not appear to enhance one's survival (by, e.g., imposing energetic costs on the carriers of the traits) and are mostly—but not always—observed in males. Darwin's (1871) insight is that these handicaps exist because they enhance one's mating success despite their costs on survival. Specifically, handicap traits can be selected via two mechanisms: inter-sexual attraction (i.e., courtship) and intrasexual competition (i.e., contest). While inter-sexual attraction selects for traits that enhance one's attractiveness to members of the opposite sex (i.e., ornament traits; e.g., peacocks' tails), intrasexual competition selects traits that help one exclude same-sex rivals from access to potential mates (weaponries; e.g., red deer stags' antlers).

In general, handicap traits are more commonly seen in males than in females because males compared to females have lower levels of parental investment (i.e., time and effort spent on producing and rearing offspring (Trivers, 1972), which, in turn, increases males' potential reproductive rates (Glutton-Brock & Vincent, 1991). When males reproduce faster than females, there will be, on average, more reproductively available males than reproductively available females in the local mating pool (i.e., a male-based operational sex ratio). Thus, males compared with females generally face more intense intrasexual competition and are thus more likely to develop handicap traits to enhance their mating success. Importantly, when males' potential reproductive rates are slowed down (due to, e.g., increased parental investment), the sex differences in handicap traits will weaken and even disappear (Glutton-Brock & Vincent, 1991).

3.2. Evolutionary Psychology

Evolutionary psychology draws on the core propositions of theories of evolution by natural and sexual selection as outlined above. Specifically, according to Cosmides and Tooby (1997), evolutionary psychology as a theoretical approach posits that the human mind functions as an information processor that consists of multiple psychological programs. Each program is believed to have evolved to resolve a specific, recurring adaptive problem that ancestral humans had faced (e.g., fitness-enhancing resources are scarce). The program will take designated environmental cues (e.g., the level of resource scarcity) as input and generate behaviors appropriate to the environment (e.g., fight or flight). The process preceding behavioral output is often unconscious (e.g., “Should I fight or flight?”), just as the behavior of seeing does not require conscious effort. The goal of evolutionary psychology is to explicate the functional structure of a psychological program (e.g., its affective and cognitive components)—and thereby better understand the human mind—by analyzing how the various components of a psychological program are coordinated to resolve specific adaptive problems.

3.3 The Evolved Functions of Aggression

Aggressive behaviors can lead to somatic damages but are prevalent in humans and other animals (Archer, 1988; Huntingford & Turner, 1987). According to evolutionary psychology, natural selection has preserved aggressive behaviors and their underlying psychology despite their costs because aggressive behaviors provide compensatory benefits (Archer, 1988; Huntingford & Turner, 1987). For animals in general, Archer (1988) argued that aggression has evolved to protect oneself, protect offspring, and enable one to compete for fitness-enhancing resources. Huntingford and Turner (1987) expanded on Archer's (1988) taxonomy and argued

that aggression serves the following functions: 1) acquiring and defending territories, 2) acquiring mates, 3) protecting offspring, 4) interacting with intrasexual members for reproductive success, 5) interacting with intersexual members for reproductive success, and 6) avoiding predation. As for humans, Buss and Shackelford (1997) argued that aggression functions to 1) co-opt resources, 2) defend against attack, 3) inflict costs on intrasexual rivals, 4) negotiate status and power hierarchies, 5) deter rivals from future aggression, 6) deter long-term mates from sexual infidelity, and 7) reduce resources expended on unrelated children. In sum, studies on humans and nonhuman animals agree that aggression, though costly, serves important biological functions.

3.3 Sex Differences in Physical and Verbal Aggression

The theory of evolution by sexual selection (see Section 3.1) readily explains the sex differences in the use of aggression in humans (Archer, 2009). Specifically, due to the sexual division of labor, males relative to females generally have a lesser parental investment. Consequently, males compared to females tend to have higher potential reproductive rates, which means that sexually mature males--on average--can return to the mating pool sooner than sexually mature females can. As a result, there tend to be more reproductively available males than reproductively available females in the local mating pool. Thus, males compared to females typically face more intense intrasexual competition for access fitness-enhancing resources, which selects for weaponry traits (e.g., antlers and claws), physical size (e.g., muscle mass), and general aggressiveness (Andersson, 1994). At the same time, gestation mostly occurs inside females' bodies and discourages females from engaging in physical aggression and verbal aggression, which often escalates into physical aggression.

Research on nonhuman animals confirmed this hypothesis (see for reviews, Archer, 1988; Huntingford & Turner, 1987), as did research on humans because men compared to women also tend to have lower levels of parental investment and higher potential reproductive rates (Archer, 2009; Puts, 2010). For example, Wilson and Daly (1985) found with homicide data in 1972 that the age of male offenders and victims, but not that of female offenders and victims, peaked from 20 to 24 years old. This finding suggests that aggression is a “young male syndrome” (Wilson & Daly, 1985, p. 61-65). Griskevicius et al. (2009) found that men’s but not women’s participants under a status-competition prime (compared to those under a control prime) reported stronger aggressive tendencies. Extending Griskevicius et al. (2009), Ainsworth and Maner (2012) found that male but not female participants who experienced a sexual-motive prime (compared to those who experienced a control prime) showed higher levels of behavioral aggression. Elaborating on Ainsworth and Maner (2012), Chen and Chang (2015) confirmed that it was the motive to compete for mates rather than the motive to attract mates that increased male participants' physical aggression.

Fewer studies have examined the sex difference in verbal aggression, but extensive evidence suggests that men are more likely than women to engage in verbal aggression. For example, Buss and Perry (1992) found that male respondents scored significantly higher than female respondents on their measure of verbal aggression. As reviewed above, Griskevicius et al. (2009) found that a status-competition prime increased male but not female participants’ self-reported aggressive tendencies. Their measure of aggressive tendency included the tendency to insult others and to get in others’ faces.

3.4 An Evolutionary Hypothesis of Aggressive Humor

The evolutionary analysis of aggression presented above offers a novel perspective to understanding aggressive humor. Like physical and verbal aggression, the use of aggressive humor appears to be costly (e.g., damaging interpersonal relationships; see Chapter 1) and correlates with socially undesirable traits (e.g., lower levels of agreeableness and higher levels of Machiavellianism; see Section 2.1). Like physical and verbal aggression, the use of aggressive humor is sexually dimorphic, with men on average being more likely than women to use aggressive humor (see Section 2.2). Lastly, as the term implies, aggressive humor is a form of verbal aggression (Dozois, Martin, & Faulkner, 2013; Martin et al., 2003). Indeed, Martin et al. (2003) found that the use of aggressive humor positively and significantly correlated with trait aggression measured with the Buss-Perry Aggression Questionnaire (see also, Dozois et al., 2013).

Given these considerations, the use of aggressive humor should be amenable to the same evolutionary analysis that has been applied to understand physical and verbal aggressive behaviors (see Section 3.2). Specifically, I argue that aggressive humor, like physical and behavioral aggressive behaviors, functions to facilitate intrasexual competition, especially in men. A specific function that the use of aggression (among men) serves is to negotiate status and power hierarchies, a function that Buss and Shackelford (1997) argued that aggressive behaviors serve (see Section 3.3). Indeed, it is often the case that individuals of higher status “tease” individuals of lower status but not the other way around. Individuals of similar status can tease each other, which is likely to jockey for a finer status differentiation. Consistent with these anecdotal observations, prior research found that the use of aggressive humor positively and significantly correlated with Machiavellianism (Martin, Jeffery, Vernon, & Veselka, 2012; Veselka, Schermer, Martin & Vernon, 2010a), and Machiavellianism characterizes a tendency to

gain status and power through manipulative means (Jones & Paulhus, 2014).

In this thesis, I offer the first test of the intrasexual-competition hypothesis of aggressive humor. Specifically, I first predict that the motive to intrasexually compete will positively correlate with the tendency to use aggressive humor (**Prediction 1**). I also predict that the correlation specified in Prediction 1 will be stronger in men than in women (**Prediction 2**).

Chapter 4: Methods

4.1 The Sample

Respondents were 400 U.S. adults (males = 197, median age = 36, ranging from 18 to 55) recruited from Amazon's Mechanical Turk (MTurk). MTurk is an online crowdsourcing marketplace that academic researchers have used to collect high-quality human-subject data from a more diverse adult population than undergraduate subject pools (e.g., Berinsky, Huber, & Lenz, 2012; Casler, Bickel, & Hackett, 2013; Hauser & Schwarz, 2016) but see Chmielewski & Kucker, 2020). Following Zhang (2017), I set the HIT approval rate to be >95% as an inclusion criterion to ensure data quality. In the sample, 73.4% of the respondents self-identified as "White of any race," 10.9% self-identified as "Asian," 7.4% as "African American or Black," 4.3% as "Hispanic of any race," 2.6% "Native American or Alaska Native," 0.5% "Native Hawaiian or Other Pacific Islander," 0.5% elected not to answer, and 0.2% chose "self-identified" or "did not know." Most of the sample was not mixed-raced; 94.8% chose one race, 4.8% chose two races, and 0.3% chose four races from the list above. In the sample, 87% of the respondents identified their sexual orientation as "Straight/ Heterosexual," 7.8% as "Gay/ Lesbian/ Homosexual," 3.8 as "Self-identified," and 1.5% preferred not to answer. Finally, 44.5% of the respondents were married, 37.5% were single, 16.5% were in a relationship, and 0.5% either chose "other" for their relational status or preferred not to answer. Participants received \$1.00 for their participation.

4.2 Procedure and Measures

After providing informed consent, participants first provided demographic information,

including their sex and sexuality. Doing so enabled me to assign respondents to questions that properly assessed their intrasexual-competition and courtship motives (see Section 4.2.3 below). Respondents completed the measures in the order they were described below. See Figure 1 for a schematic representation of the procedure of this research.

4.2.1 The Humor Style Questionnaire (HSQ)

After providing demographic information, all participants completed the 32-item HSQ (Martin et al., 2003; Appendix 2) that measures their self-reported tendency to use affiliative (e.g., “I enjoy making people laugh”), self-enhancing (e.g., “If I am feeling depressed, I can usually cheer myself up with humor”), aggressive (e.g., “If someone makes a mistake, I will often tease them about it”), and self-defeating (e.g., “I let people laugh at me or make fun at my expense more than I should”) humor (1 *strongly disagree*, 7 *strongly agree*). After reverse coding, all four subscales showed satisfactory internal consistency with Cronbach’s α estimated .88, .87, .76, and .86 for the affiliative, self-enhancing, aggressive, and self-defeating humor subscales. Higher values indicated a stronger tendency to use a particular type of humor, and respondents’ self-reported tendency to use aggressive humor is the core outcome variable of this research.

4.2.2 Mating Strategies

Respondents then completed a 26-item scale on mating strategies (adapted from Chen & Chang, 2015; Appendix 3). This scale measures respondents’ self-reported tendency to engage in 1) intrasexual competition (e.g., “I would compete with other guys for the women I like”) and 2) courtship (e.g., “I would do everything to attract the women I like”) (1 *totally disagree*, 7 *totally agree*). The original scale measured only heterosexual males’ mating strategies and was thus

revised in this research to measure heterosexual females' and homosexual individuals' mating strategies. For example, two items that measure heterosexual women's mating strategies are "I would compete with other women [men] for the guy [women] I like" (intrasexual competition; pronouns in brackets were used in the original item that measured heterosexual men's motive to intrasexually compete") and "I would do everything to attract the man [woman] I like" (courtship; the pronoun in brackets was used in the original item that measured heterosexual men's courtship motive). To measure homosexual males' mating strategies, two example items are "I would compete with other men for the guy I like" (intrasexual competition) and "I would do everything to attract the man I like" (courtship). Lastly, to measure homosexual females' mating strategies, two example items are "I would compete with other women for the woman I like" (intrasexual competition) and "I would do everything to attract the woman I like" (courtship). Respondents who chose "self-identified" or "prefer not to answer" did not receive the mating strategies measure. See Appendix 3 for details. Both subscales—intrasexual competition and courtship—showed excellent internal consistency (Cronbach's $\alpha = .95$ and $.90$). Higher values indicate a stronger tendency to engage in intrasexual competition and courtship, and respondents' self-reported intrasexual competition motive is the core predictor variable of this research.

The tendency to use aggressive humor and the motive to intrasexually compete are the core variables for hypotheses testing. However, measuring courtship motive would enable me to test that it is intrasexual competition but not courtship that predicts the tendency to use aggressive humor. To stringently test the predictions, I further included several additional covariates. First, I measured participants' self-perceived physical strength and attractiveness because those variables have been shown to correlate with aggression in men and women (Sell et

al., 2009). I also measured sociosexuality to control for respondents' mating effort. Lastly, I measured the Dark Triad personality traits because they have been shown to correlate with the use of aggressive humor (Martin et al., 2012; Veselka et al., 2010a) and also intrasexual competition (Carter, Montanaro, Linney & Cambell, 2015; Jonason, Li, Webster, & Schmitt, 2009).

4.2.3 Physical Strength and Attractiveness

Respondents then completed measures of self-perceived physical strength ("I am physically stronger than __% of other men/women") and attractiveness ("I am more attractive than __% men/women") (Sell, Tooby, & Cosmides, 2009; Appendix 4). Respondents who chose "self-identified" or "prefer not to answer" did not receive the physical strength and attractiveness measure.

4.2.4 Sociosexuality (SOI-R)

Next, all respondents completed the Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008), which measures one's tendency to engage in short-term mating (Appendix 5). After reverse recording, the scale showed satisfactory internal consistency (Cronbach's $\alpha = .87$). Higher values indicate a stronger tendency to engage in short-term mating.

4.2.5 Dark Triad (SD3)

Lastly, respondents were then asked to complete three scales that respectively measure one's narcissism, Machiavellianism, and psychopathy (collectively known as the "Dark Triad of personality or SD3; Jones & Paulhus, 2014; Appendix 6). After recoding, the scales reported strong internal consistent, with narcissism ($\alpha = .79$), Machiavellianism ($\alpha = .87$), and

psychopathy ($\alpha = .81$). Larger values indicate higher levels of narcissism, Machiavellianism, and subclinical psychopathy.

Chapter 5: Results

Descriptive statistics and inter-correlations are presented in Table 2.

To examine the potential confounding effect of marital status on the correlation between the motive to intrasexually compete and the tendency to use aggressive humor, I first recoded the marital status variable (1 = married, 2 = non-married) and created two sub-samples, namely married and non-married respondents. Next, I conducted two ordinary-least-squared (OLS) regression models, the first with the subsample of married respondents ($n = 171$) and then the subsample non-married respondents ($n = 206$). The regression coefficients between the the motive to intrasexually compete and the use of aggressive was positive and significant in both models: for married respondents, $b = 0.20$, $se = 0.039$, $t = 5.59$, $p < .001$; and for non-married respondents, $b = 0.37$, $se = 0.063$, $t = 5.87$, $p < .001$. Next, I compared these two regression coefficients in a Z -test (Preacher, 2002; <http://quantpsy.org>). The results revealed that the two regression coefficients (i.e., 0.22 versus 0.37) did not significantly differed from each other. Thus, the results marital status (i.e., relationship status) did not significantly affect correlation between the motive to intrasexually compete and the use of aggressive humor (see Figure 2). We thus used the full sample for the following analyses.

5.1 The Sex Differences in Use of Different Types of Humor

Before testing this study's core predictions, I first performed a series of independent-sample t -tests to verify whether men were generally more likely than women to use aggressive humor. As expected, the male respondents of this study on average scored higher than female respondents on aggressive-humor subscale ($M = 3.72$, $SD = 1.02$ versus $M = 3.19$, $SD = 1.03$), $t(397) = 5.13$, $p < .001$, Cohen's $d = 0.52$ (Figure 3). In comparison, the sex differences in the use of the other three types of humor were non-significant ($ps = .31$, $.13$, and $.11$ for affiliative,

self-enhancing, and self-defeating humor; Figure 3). The significant sex difference in the use of aggressive humor replicated prior studies' findings (see Section 2.2).

5.2 Did the Motive to Introsexually Compete Positively Correlate with the Tendency to Use Aggressive Humor?

Prediction 1 posited that the motive to introsexually compete would positively correlate with the tendency to use aggressive humor. To test this prediction, I first estimate respondents' self-reported tendency to use aggressive humor in an OLS regression model with the motive to introsexually compete as the sole predictor (Model 1, Table 3). I then entered different classes of covariates to test the robustness of the correlation found in Model 1. These covariates included: 1) courtship motive (Model 2, Table 3), 2) SOI (Model 3, Table 3), 3) self-perceived physical attractiveness and strength (Model 4, Table 3), and 4) SD3 (Model 5, Table 3). In Model 6 (Table 3), the tendency to use aggressive humor was regressed to compete introsexually, and all covariates to see which variable(s) emerged as significant predictors.

Confirming Prediction 1, Model 1 revealed a significant, positive correlation between the motive to introsexually compete and the tendency to use aggressive humor (semi-partial $r = 0.13$).³ Further supporting Prediction 1, this correlation remained significant after courtship motive, SOI, and self-perceived physical attractiveness and strength were controlled for (Model 2-4). However, in Model 5, the correlation between the motive to introsexually compete and the tendency to use aggressive humor was not significant when the SD3 was included as covariates. Instead, Machiavellianism and psychopathy positively and significantly correlated with the tendency to use aggressive humor. Finally, Model 6 showed that, of all the variables tested in

³ By convention, $r_s = .10, .30,$ and $.50$ denote small, medium, and large effect sizes (Cohen, 1992).

Model 1-4, only SOI, Machiavellianism, and psychopathy emerged as significant predictors of the tendency to use aggressive humor. Overall, Prediction 1 was supported in four of the six models.

5.3 Did Sex Moderate the Correlation between the Motive to Introsexually Compete and Tendency to Use Aggressive Humor?

Prediction 2 stated that the motive to introsexually compete would correlate with the tendency to use aggressive humor more strongly in men than in women. I used two methods to test this prediction. With the first method, I estimated the tendency to use aggressive humor from the motive to introsexually compete in two OLS regression models, one with the male subsample ($n = 187$) and the other with the female subsample ($n = 190$). The regression coefficient of the motive to introsexually compete and the use of aggressive humor was positive and significant in both models: for male respondents, $b = 0.20$, $se = 0.049$, $t = 4.10$, $p < .001$; and for female respondents, $b = 0.28$, $se = 0.046$, $t = 6.04$, $p < .001$. Next, I compared these two regression coefficients in a Z test, which is facilitated in an online application developed by Preacher (2002; <http://quantpsy.org>). The test provided no evidence that the two regression coefficients (i.e., 0.20 versus 0.28) significantly differed from each other.

With the second method, I used the full sample to estimate the following moderated multiple regression model (Aiken & West, 1991):

Aggressive_humor_i

$$= \beta_0 + \beta_1 \text{Intraseexual_competition}_i + \beta_2 \text{Sex}_i \\ + \beta_3 \text{Intraseexual_competition} \times \text{Sex}_i + u_i$$

In this model, when the categorical variable “Sex” is dummy-coded (males = 0, females = 1), the

regression coefficient was associated with the interaction term (i.e., β_3) tests whether the simple slope of the motive to intrasexual competition differs between male and female respondents. The analysis revealed a significant positive simple slope of the motive to intrasexually compete ($b = 0.20$, $se = 0.049$, $t = 4.10$, $p < .001$; for male respondents) and a significant simple effect of respondents' sex ($b = -0.70$, $se = 0.22$, $t = -3.14$, $p = .002$). This effect indicated that the sex difference in the tendency to use aggressive humor remained significant even after the motive to intrasexually compete was controlled for. Importantly, the interaction term between Sex and the Motive to intrasexually compete was not significant ($b = 0.08$, $se = 0.067$, $t = 1.13$, $p = .26$; see Figure 4). Thus, consistent with the results obtained from the first approach (see above), there was no evidence that sex moderated the correlation between the motive to intrasexually compete and the tendency to use aggressive humor. These findings do not support Prediction 2.

Chapter 6: Discussion

This research provided an evolutionary, functional analysis of the use of aggressive humor, drawing on sexual selection theory (Darwin, 1871) and, more specifically, the notion of intrasexual competition. The hypothesis is that similar to physical aggression, and other types of verbal aggression, the use of aggressive humor facilitates intrasexual competition. It followed from this hypothesis that the motive to intrasexually compete would positively correlate with the tendency to use aggressive humor (Prediction 1). Further, because men compared to women have faced more intense intrasexual competition throughout human evolutionary history (Puts, 2010), I also predicted that the correlation between the motive to intrasexually compete and the tendency to use aggressive humor would be stronger in men than in women (Prediction 2).

I found that respondents' motive to intrasexually compete but not the motive to engage in courtship positively and significantly correlated with their self-reported tendency to use aggressive humor in four out of six OLS regression models (see Model 1 - 4, Table 3). These findings largely supported Prediction 1. However, this correlation became non-significant when the Dark-Triad personality traits—in particular, Machiavellianism and psychopathy, were entered as covariates (Model 5 and 6, Table 3). These findings suggest that Machiavellianism and psychopathy mediated the correlation between the motive to intrasexually compete and the tendency to use aggressive humor (i.e., intrasexual competition → Machiavellianism [or psychopathy] → aggressive humor). Consistent with this reasoning, prior research found that intrasexual competition correlated with both Machiavellianism and psychopathy in males and females (Carter et al., 2015; Jonason et al., 2009) alike. Corroborating those findings, this study's zero-order correlations showed that the motive to intrasexually compete positively and significantly correlated with Machiavellianism and psychopathy ($r = 0.61$ and 0.70 , $ps < 0.01$;

see Table 1). Future research may consider formally testing whether Dark Triad personality traits mediate the correlation between the motive to compete intrasexually and the tendency to use aggressive humor.

Regarding Prediction 2, I found that the coefficient of the correlation between the motive to compete intrasexually and the self-reported tendency to use aggressive humor in male respondents was similar in size as that in female respondents (see Figure 4). I used two approaches to compare these two correlation coefficients formally, and neither approach provided evidence that the two correlation coefficients significantly differed from each other. This finding suggests that, while men compared to women tend to have stronger tendencies to use aggressive humor (see Section 3.3 and 5.1), both men and women are generally more likely to use aggressive humor as they are more motivated to intrasexually compete. In hindsight, this finding is not surprising because women intrasexually compete, too (Buss & Perry, 1992; Griskevicius et al., 2009). When they do, they primarily use verbal means to attack their same-sex rivals (e.g., derogation and spreading rumors; Buss & Perry, 1992; Griskevicius et al., 2009). This finding regarding Prediction 2 suggests that using aggressive humor is another way women engage in intrasexual competition. Thus, while the results do not support Prediction 2, they have important implications for the growing body of research on women's intrasexual competition (Stockley & Campbell, 2013; Vaillancourt, 2013).

6.1 Implications for Prior Research on Aggressive Humor

As reviewed in Section 2.1, prior research using the HSQ found that the use of aggressive humor tends to negatively correlate with traits that are typically considered desirable (e.g., empathy, perspective-taking) and positively correlated with traits that are typically considered

undesirable (e.g., Machiavellianism, psychopathy, social avoidance). These findings have been taken to suggest that aggressive humor is a maladaptive type of humor, in the sense that it tends to damage interpersonal relationships, be used to cope with suboptimal psychological development in early childhood, and to reduce psychological well-being (Dozois et al., 2013; Guenter, Schruers, Emmerik, Gijbers, & Itersen, 2013)

However, the fact that aggressive humor is a major type of humor used across cultures (i.e., being universal; see Section 2.1) suggests that it has been preserved by nature. According to evolutionary psychology (Cosmides & Tooby, 1997), a costly trait (e.g., decreasing one's chance of survival) that has been preserved by nature must offer compensatory benefits. The findings of this thesis suggested one such benefit that aggressive humor provides is facilitating intrasexual competition for both men and women. This is a benefit because humans have similar design features and thus rely on similar resources for survival and reproduction. This competition is especially intense in the mating context because men and women of high "mate value" are almost always a scarce resource (Puts, 2010). Thus, any trait or behavior that, however, indirectly increases one's chance to exclude same-sex others for accessing potential mates would be preserved despite their negative impact on other aspects of an individual (e.g., psychological well-being). After all, nature does not care how one feels but whether an individual is able to pass their genes to the next generation (Darwin, 1859; Daly & Wilson, 1978).

Thus, this thesis points to a novel and potentially fruitful direction for future research on aggressive humor, that is, to examine the role of aggressive humor in contexts related to male and female intrasexual competition. For example, does the motive to intrasexually compete predict the use of aggressive humor above and beyond a general competitive personality? Are variables related to intrasexual competition able to account for the large sex difference in the use

of aggressive humor (see Section 5.1)? Will primes of intrasexual competition relative to a control prime increase the use of aggressive humor in men and women? How would men and women respond to aggressive humor when there are status discrepancies between them and the teller of the joke? All these are theoretically important and interesting questions to address in future research.

6.2 Implications for an Evolutionary Approach to Studying Humor

This thesis is not the first attempt to offer an evolutionary explanation of humor. Miller (2000) also hypothesized that humor is sexually selected but argued that the main selection mechanism is intersexual attraction (i.e., courtship; Greengross & Miller, 2011; Miller, 2000). Specifically, Miller argued that cultural displays, such as painting and music albums, are similar to peacocks' extravagant tails and function to demonstrate men's quality and to attract potential mates. Miller believed that humor is a type of cultural display and thus amenable to the same intersexual-attraction analysis as other types of cultural displays (Miller, 2000). Supporting this hypothesis, Greengross and Miller (2011) had 400 university students (50% female) write captions for New Yorker cartoons and coded for respondents' verbal humor. Greengross and Miller found that respondents' verbal humor positively predicted both male and female respondents' mating success.

The sexual-selection hypothesis advanced in this thesis differs from Miller's hypothesis by focusing on intrasexual competition (i.e., contest) rather than intersexual attraction (i.e., courtship) as the main selection mechanism. Indeed, I found that the courtship motive did not significantly correlate with the use of aggressive humor when it was entered simultaneously with the motive to intrasexually compete (Model 2, Table 3). However, the intrasexual-competition

hypothesis advanced in this research and Miller's courtship hypothesis can co-exist because they likely explain the evolved function of different types of humor. While the intrasexual-competition hypothesis is better at explaining the evolved function of aggressive humor (as the findings of this research suggest), the courtship hypothesis is likely better at explaining the evolved function of self-enhancement and/or affiliative humor. Uniting these two hypotheses will likely offer a more comprehensive sexual-selection explanation of humor in general.

6.3 Limitations

The first limitation of this research is the scale used to measure respondents' self-reported tendency to use aggressive humor. The 7-point scale was anchored with "1 *strongly disagree*" and "7 *strongly agree*" and thus any score below 4 would arguably indicate that a respondent disagreed that he/she would use aggressive humor. If this assumption is correct, then the sample mean on the use of aggressive humor ($M = 3.45$, $SD = 1.05$; for men: $M = 3.72$, $SD = 1.02$; for women: $M = 3.19$, $SD = 1.03$) would indicate that, on average, the respondents—males and females alike—did not believe that they would use aggressive humor. As a result, it might be problematic to argue that the result of this thesis indicates that men are on average more likely than women to use aggressive humor. A more accurate interpretation would be that, compared to men, women disagree more that they would use aggressive humor. Thus, in hindsight, it would have been more appropriate if I had measured the use of aggressive humor with a scale anchored by "1 *never*, 7 *always*."

A second limitation of this study is that it used cross-section data, which generally do not permit the making of causal inferences. Thus, more evidence is needed to argue that the motive to intrasexually compete *causally* precedes the use of aggressive humor. For example, future

research may consider using the priming paradigm (Ainsworth & Miller, 2013) and compare men's (self-reported) tendency to use aggressive humor under the primes of intrasexual competition and control primes.

As a third limitation, this research relied on self-report data, which could have caused Type-II errors (i.e., false negatives). For instance, following the intrasexual-competition hypothesis, I predicted that men's physical strength would positively correlate with their use of aggressive humor. While this correlation was positive and significant in zero-order correlations (see Table 2), it was not in OLS regression that controlled the motive to intrasexually compete (Model 4, Table 3). The association between physical strength and the use of aggressive humor may be better captured by measuring one's *actual* physical strength instead of self-perceptions. Thus, future research may consider including objective measures of men's (and women's) physical strength (e.g., flexed bicep circumference, chest strength) to further test the intrasexual-competition hypothesis of aggressive humor.

Finally, the use of self-report data also might have also undermined the ecological validity of this research. For example, using HSQ only allowed me to measure one's *tendency* to use aggressive humor but not one's actual use. Future research may consider recording how men or women in a relationship talk about potential mate competitors and subsequently coding the frequency in which aggressive humor is used. A naturalistic study like this (see also, Shuster, 2012) would be valuable to corroborate the findings of this thesis and offer a more stringent test of the intrasexual-competition hypothesis of aggressive humor.

Chapter 7: Conclusion

This thesis offered an evolutionary, functional analysis of the use of aggressive humor, which has been shown to have a negative impact on interpersonal relationships. Following the theory of evolution by sexual selection, I argued that aggressive humor, similar to physical and other forms of verbal aggression, enables men and women to compete with same-sex rivals for fitness-enhancing resources. The findings from a cross-section survey generally supported this intrasexual-competition hypothesis of aggressive humor by finding a positive and significant correlation between the motive to compete intrasexually and the tendency to use aggressive humor. While more research is needed to establish the causal relationship between intrasexual competition and the use of aggressive humor, the findings of this thesis provides a plausible explanation of why a type of humor that generally damages interpersonal relationships has been widely observed and practiced.

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Appendix 1
Demographics Information

For the following items, please select the *one* response that describes you or fill in the blank as appropriate.

Age: _____

Your sex is:

1. Male
2. Female
3. Self-identified _____
4. Prefer not to answer

Ethnicity (Check all that apply):

1. Hispanic of any race
2. Native American or Alaska Native
3. Asian
4. Black or African American
5. Native Hawaiian or Other Pacific Islander
6. White
7. Races and Ethnicities Unknown
8. Self-identified _____
9. Prefer not to answer

Sexual Orientation

1. Gay/ Homosexual
2. Straight/Heterosexual
3. Self-identified _____
4. Prefer not to answer

Relationship Status

1. Single
2. In a relationship
3. Married
4. Self-identified _____
5. Prefer not to answer

Appendix 2

Humor Styles Questionnaire (Martin, Puhlik-Doris, Larsen, Gray, & Weir, 2003)

Instructions: Please indicate how much you agree or disagree with the following statements (1 *Strongly Disagree*; 7 *Strongly Agree*).

(AFF = Affiliative humor; SE = Self-enhancing humor; AGG = Aggressive humor; SD = Self-deprecating humor; * = reverse coded)

1. I usually don't laugh or joke around much with other people. AFF *
2. If I am feeling depressed, I can usually cheer myself up with humor. SE
3. If someone makes a mistake, I will often tease them about it. AGG
4. I let people laugh at me or make fun at my expense more than I should. SD
5. I don't have to work very hard at making other people laugh. -- I seem to be a naturally humorous person. AFF
6. Even when I'm by myself, I'm often amused by the absurdities of life. SE
7. People are never offended or hurt by my sense of humor. AGG *
8. I will often get carried away in putting myself down if it makes my family or friends laugh. SD
9. I rarely make other people laugh by telling funny stories about myself. AFF *
10. If I am feeling upset or unhappy, I usually try to think of something funny about the situation to make myself feel better. SE
11. When telling jokes or saying funny things, I am usually not very concerned about how other people are taking it. AGG
12. I often try to make people like or accept me more by saying something funny about my own weaknesses, blunders, or faults. SD
13. I laugh and joke a lot with my closest friends. AFF
14. My humorous outlook on life keeps me from getting overly upset or depressed about things. SE
15. I do not like it when people use humor as a way of criticizing or putting someone down. AGG *
16. I rarely say funny things to put myself down. SD *
17. I usually don't like to tell jokes or amuse people. AFF *
18. If I'm by myself and I'm feeling unhappy, I make an effort to think of something funny to cheer myself up. SE
19. Sometimes I think of something that is so funny that I can't stop myself from saying it, even if it is not appropriate for the situation. AGG
20. I often go overboard in putting myself down when I am making jokes or trying to be funny. SD
21. I enjoy making people laugh. AFF
22. If I am feeling sad or upset, I usually lose my sense of humor. SE *
23. I never participate in laughing at others even if all my friends are doing it. AGG *
24. When I am with friends or family, I often seem to be the one that other people make fun of or joke about. SD
25. I don't often joke around with my friends. AFF *

26. It is my experience that thinking about some amusing aspects of a situation is often a very effective way of coping with problems. SE
27. If I don't like someone, I often use humor or teasing to put them down. AGG
28. If I am having problems or feeling unhappy, I often cover it up by joking around, so that even my closest friends don't know how I really feel. SD
29. I usually can't think of witty things to say when I'm with other people. AFF *
30. I don't need to be around other people to feel amused – I can usually find things to laugh about even when I'm by myself. SE
31. Even if something is really funny to me, I will not laugh or joke about it if someone will be offended. AGG *
32. Letting others laugh at me is my way of keeping my friends and family in good spirits.
SD

Appendix 3

Men's Mating Strategy Scale (Chen & Change, 2015)

The following questions ask what you would do to attract a man[woman] you like. That man[woman] can be your current partner if you are in a relationship, but he can also be someone that you have a crush on. Please indicate how much you agree or disagree with the following statements. (1 *Strongly Disagree*; 7 *Strongly Agree*).

Women's Mating Strategy Scale (alteration to Chen & Change, 2015)

Alterations: Any gender or sex vocabulary was replaced with an antonym

(e.g., women → guys, her → him, men → women, etc.)

Courtship

1. I would do everything to attract the woman[guy] I like.
2. I would put on good behavior in front of her[him].
3. I would talk to her[him] more.
4. I would make her[him] show interest in me.
5. I would work hard to accommodate her[him].
6. I would show her[him] how good I am.
7. I would work hard to show her[him] that I am worth her[his] love.
8. I would do what she[he] likes.
9. I would learn to play musical instruments for her[him].
10. I would try every means to make her[him] like me.
11. I would learn special skills to attract her[him].
12. I would appeal to her[him].

Intrasexual competition

1. I would compete with other guys[women] for the woman[guy] I like.
2. I would tease other guys'[women's] physical appearance in front of her[him].
3. I would tell her[him] that other guys[women] are dumb.
4. I would fight anyone who covets the guy[woman] I like.
5. I would badmouth other guys[women] interested in her[him].
6. I would challenge anyone who shows an interest in the woman[guy] I like.
7. I would retaliate if anyone tries to steal her[him].
8. I would threaten anyone who dares to think about her[him].
9. I would prevent other men[women] from getting too close to her[him].
10. I would not let her[him] talk to other guys[women].
11. I would show her[him] off with my friends.
12. I would humiliate other guys[women] in front of her[him].
13. I would make sure I am respected by other guys[women] in front of her[him].
14. I would brag about her[him] to other guys [women].

Appendix 4

Self-Report Physical Strength and Attractiveness Questions (Sell, Tooby, & Cosmides, 2009)

Male

1. I am stronger than ___% of other men.
2. I am more attractive than ____% of other men of my age.

Female

1. I am stronger than ____ % of other women.
2. I am more attractive than ____% of other women of my age.

- 5) About once every two weeks
 - 6) About once a week
 - 7) Several times per week
 - 8) Nearly every day
 - 9) At least once a day
9. In everyday life, how often do you have spontaneous fantasies about having sex with someone you have just met?
- 1) Never
 - 2) Very seldom
 - 3) About once every two or three months
 - 4) About once every two weeks
 - 5) About once every two weeks
 - 6) About once a week
 - 7) Several times per week
 - 8) Nearly every day
 - 9) At least once a day

Appendix 6

Short Dark Triad (SD3; Jones & Paulhus, 2014)

Please indicate how much you agree or disagree with the following statements (1 *Strongly Disagree*; 5 *Strongly Agree*).

(* = reverse coded)

Machiavellianism subscale

1. It's not wise to tell your secrets.
2. I like to use clever manipulation to get my way.
3. Whatever it takes, you must get the important people on your side.
4. Avoid direct conflict with others because they may be useful in the future.
5. It's wise to keep track of information that you can use against people later.
6. You should wait for the right time to get back at people.
7. There are things you should hide from other people because they don't need to know.
8. Make sure your plans benefit you, not others.
9. Most people can be manipulated.

Narcissism subscale

1. People see me as a natural leader.
2. I hate being the center of attention. *
3. Many group activities tend to be dull without me.
4. I know that I am special because everyone keeps telling me so.
5. I like to get acquainted with important people.
6. I feel embarrassed if someone compliments me. *
7. I have been compared to famous people.
8. I am an average person. *
9. I am likely to show off if I get the chance.

Psychopathy subscale

1. I like to get revenge on authorities.
2. I avoid dangerous situations. *
3. Payback needs to be quick and nasty.
4. People often say I'm out of control.
5. It's true that I can be mean to others.
6. People who mess with me always regret it.
7. I have never gotten into trouble with the law. *
8. I enjoy having sex with people I hardly know.
9. I'll say anything to get what I want.

Appendix 7

Table 1

Correlations with Aggressive Humor

	Population		Correlations with Aggressive Humor
	<i>N</i>	Sample	(+ = positive correlation; - = negative correlation)
(Bippus et al., 2012)	442	U.S. West Coast University U.S. South-Central University	(+) funniness, likability, counterarguing, credibility
(Cann & Matson, 2014)	353	North Carolina, United States	(+) maladaptive humor = socially undesirable
(DiDonato & Jakubiak, 2016)	224	Mid-Atlantic Jesuit University/ workers on MTurk	(-) humor production, short-term relationships
(Dozois et al., 2013)	208	Psych students University of Western Ontario	(+) anger, hostility, physical and verbal aggression
(Greengross & Miller, 2011)	96	Intro – Psych students University of New Mexico	(-) agreeableness, neuroticism
(Hampes, 2016)	112	Midwest community college students	(-) forgiveness likelihood, presences of positive
(Hugelshofer et al., 2006)	418	Intro-Psych students Pacific Northwest	(+) depressive symptoms among women
(Kazarian & Martin, 2006)	278	Lebanese Residents	(+) horizontal individualism (-) horizontal collectivism, vertical collectivism, vertical individualism, family adjustment
(Kuiper & Harris, 2009)	105	Undergrad Psych students	(+) dysfunctional coping patterns, greater denial, reduction in the ability to change perspective
(Martin et al., 2003)	1195	Intro – Psych students University of Western Ontario	(+) neuroticism, unmitigated masculinity (-) agreeableness, conscientiousness, femininity
(Martin et al., 2012)	200	Psych students	(+) Machiavellianism, psychopathy

	Population		Correlations with Aggressive Humor
	<i>N</i>	Sample	(+ = positive correlation; - = negative correlation)
(Masui et al., 2013)	139	Undergraduate students, Japan	(+) psychopathy, social exclusion
(Mauriello & McConatha, 2007)	182	Psych students The University of Pennsylvania, community adults	(+) coping humor scale
(Ozyesil, 2012)	440	Turkey	(-) self-esteem
(Ruch & Heintz, 2019)	570	Swiss (70.7%) German (20.9%)	(+) sarcasm, fun, irony
(Sari, 2016)	489	High School students Turkey	(+) cyberbullying
(Taher et al., 2008)	435	Lebanon	(+) depressive symptoms, social anxiety, social avoidance
(Tucker et al., 2013)	306	Psych students	(+) symptoms of depression
(Veselka et al., 2010b)	114	Twins from Canada and the United States	(+) psychopathy, Machiavellianism
(Veselka et al., 2010a)	1186	Twins from King's College London, England	(-) honesty-humility, emotionality, agreeableness, conscientiousness
(Winterheld et al., 2013)	96	Intro psychology students who were in a relationship	(+) avoidant attachment (-) partner satisfaction with conflict resolution
(Wu et al., 2016)	431	Taiwan adolescents	(-) empathy, perspective-taking
(Yip & Martin, 2006)	111	Undergrad students University of Western Ontario	(-) emotional perception, provide emotional support to others, ability to manage conflicts in relationships
(Yue et al., 2014)	337	City University of Hong Kong (159) Hangzhou Normal University (178)	(+) Hong Kong (-) Hangzhou (ns) emotional loneliness and social loneliness

Appendix 8

Table 2

Descriptive Statistics and Intercorrelations

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Affiliative Humor	5.10	1.19	-										
2. Self-enhancing Humor	4.78	1.09	0.49**	-									
3. Aggressive Humor	3.45	1.05	0.06	0.14**	-								
4. Self-defeating Humor	3.69	1.23	-0.04	0.15**	0.42**	-							
5. Intrasexual Competition	2.98	1.48	-0.30**	0.07	0.36**	0.46**	-						
6. Courtship	4.81	1.14	0.01	0.20**	0.16**	0.37**	0.55**	-					
7. SOI-R	4.14	1.77	-0.07	0.15**	0.42**	0.27**	0.33**	0.18**	-				
8. Machiavellianism	3.10	0.86	-0.17**	0.02	0.49**	0.32**	0.61**	0.42**	0.41**	-			
9. Narcissism	2.98	1.26	-0.09	0.20**	0.31**	0.30**	0.66**	0.47**	0.34**	0.58**	-		
10. Psychopathy	2.11	1.47	-0.29**	0.07	0.50**	0.46**	0.70**	0.36**	0.57**	0.62**	0.64**	-	
11. Physical Strength	50.70	24.22	-0.012*	0.11*	0.16**	0.14**	0.37**	0.21**	0.26**	0.45**	0.33**	0.40**	-
12. Attractiveness	52.80	23.68	-0.11*	0.09	0.14**	0.09	0.40**	0.26**	0.23**	0.54**	0.36**	0.37**	0.68**

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Appendix 9

Table 3

Regression Analysis on Use of Aggressive Humor

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	2.67 *** (0.11)	2.85 *** (0.22)	2.09 *** (0.14)	2.66 *** (0.14)	2.00 *** (0.18)	2.03 *** (0.25)
Intrasexual Competition	0.26 *** (0.34)	0.29 *** (0.04)	0.18 *** (0.03)	0.26 *** (0.03)	-0.02 (0.5)	0.29 (0.50)
Courtship		-0.50 (0.05)				-0.06 (0.5)
SOI-R			0.20 *** (0.03)			0.10 ** (0.03)
Physical Strength				-0.00 (0.00)		-0.00 (0.00)
Attractiveness				-0.00 (0.00)		-0.00 (0.00)
Machiavellianism					0.39 *** (0.07)	0.38 *** (0.07)
Narcissism					-0.10 (0.05)	-0.05 (0.06)
Psychopathy					0.28 *** (0.05)	0.20 *** (0.05)
R^2	0.13	0.13	0.23	0.13	0.30	0.33
Degrees of Freedom	378	378	378	378	377	378

Notes. The first line is unstandardized regression coefficients, followed by standard error in parentheses.

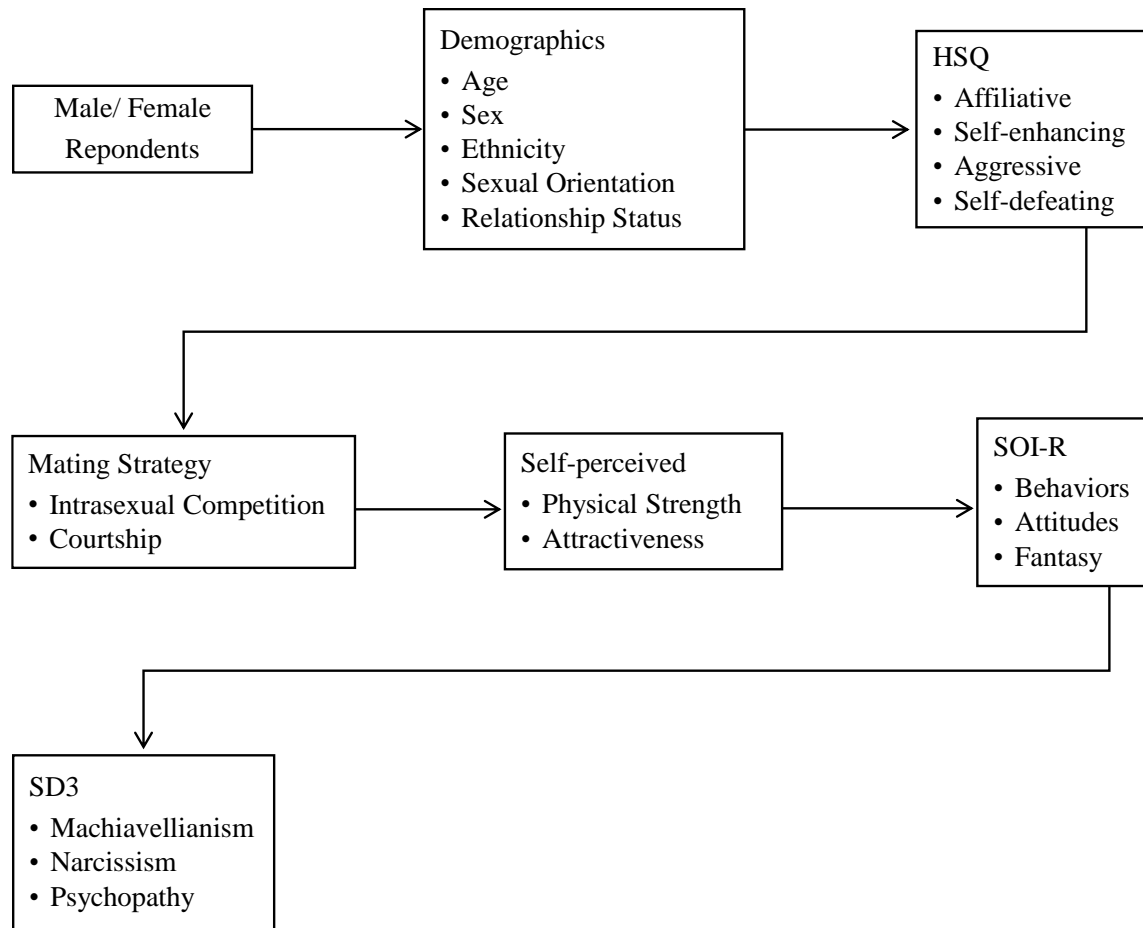
***. Correlation is significant at $p < 0.001$ level (2-tailed).

** . Correlation is significant at $p = 0.01$ level (2-tailed).

Appendix 10

Figure 1

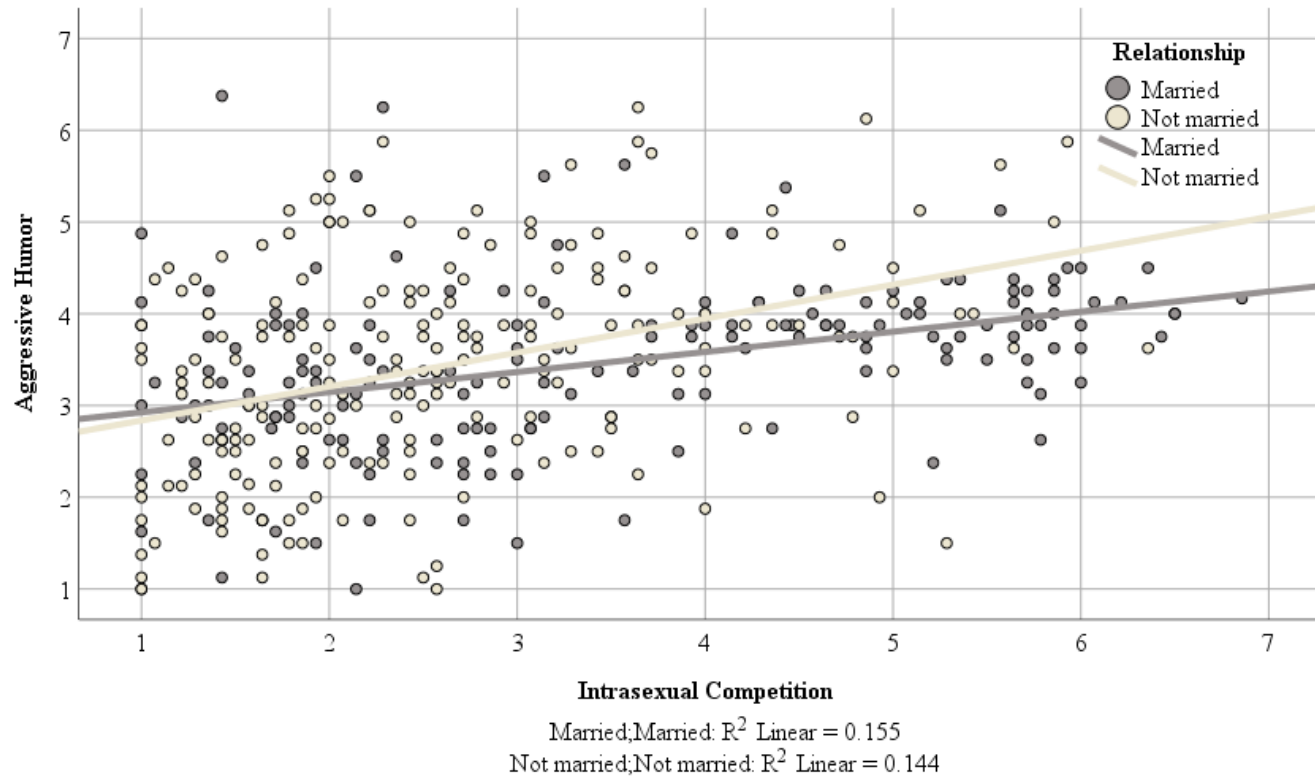
The Procedure of Methods



Appendix 11

Figure 2

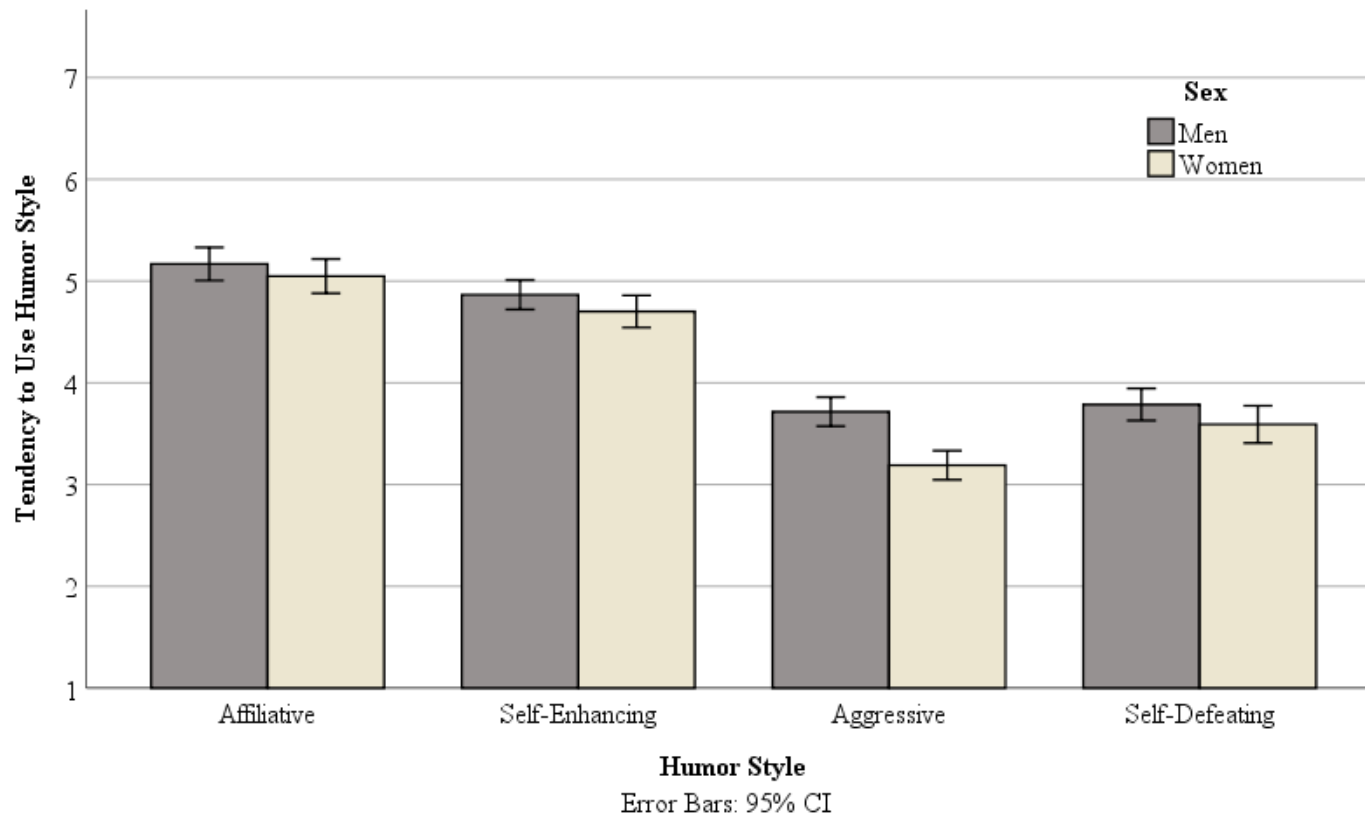
Relationship Correlations with the Motive to Introsexually Compete and the Use of Aggressive Humor



Appendix 12

Figure 3

The Sex Differences in the Use of Different Types of Humor



Appendix 13

Figure 4

Sex Correlations with the Motive to Intrasexually Compete and Tendency to Use Aggressive Humor

