University of Nevada, Reno

The Predisposition of the Five Factor Personality Traits Associated with Animal Attraction

A thesis submitted in partial fulfillment
of the requirements for the degree of

BACHELOR OF SCIENCE, VETERINARY SCIENCE

by

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ABSTRACT

Although there is considerable public interest in animal welfare, little work has been conducted on the relationship between animal attitudes and personality. The following study attempts to determine if there is a relationship between personality traits and animal welfare attitudes. The author examines the relationship between personality and attitudes toward animal welfare by administering the Mini-International Personality Item Pool Scale and the Animal Attitudes Scale to ninety-seven college students. The personality factors were only weakly correlated with animal welfare attitudes and none of the factors were statistically significant. The results of the following study will add to the increasing amount of literature on personality and animal welfare attitudes and will be useful in both the psychological and veterinary fields by providing information about human attitudes toward animals.

ACKNOWLEDGEMENTS

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INTRODUCTION

The question being addressed in this study is: Is there a significant correlation between personality traits—as described by the Five Factor Model (FFM) of personality—and animal welfare attitudes? This research will be building on previous studies; however, since there has not been much work done on the correlation between personality and animal affinity, any new research will help to progress the field. The results of this study will not only be helpful in psychological fields, but will be helpful in veterinary fields as well. Understanding attitudes towards animals is essential in veterinary practice in order to properly assess the relationship between the pet owner and the patient. Having a set body of knowledge on the level of affinity certain personality types possess for animals is an excellent tool for predicting how people may react to animals in welfare settings. Mistreatment of an animal can be an indicator of violent tendencies towards other people as well (Gullone, 2012). For this reason, having a vast database on aspects of human personalities and how they may correlate with an attraction to, or empathy for, animals is of the utmost importance. All research conducted in this field will be helpful in further exploring this novel topic. This study will play a role in advancing not only the field, but the general public's knowledge and interest as well.

The views people have concerning the treatment toward non-human animals differ significantly. While some may find the hunting of wild game, the consumption of meat and the use of non-human animals in medical and psychological research disturbing, others may not associate these activities with any moral problems (Mathews and Herzog, 1997). What can these differences in the perception of animal usage be attributed to?

Scientists have only recently begun to study attitudes towards non-human animals. However, research into animal attitudes has been gaining popularity and scientists have found that demographic variables like educational level, geographic region, age and race (Kellert, 1988), gender (Driscoll, 1992; Gallup and Beckstead, 1988; Herzog et al., 1991; Hills, 1993; Kellert and Berry, 1987), early experiences with pets (Paul and Serpell, 1993), beliefs about animal mentality (Herzog and Galvin, 1997) and religious affiliation (Bowd and Bowd, 1989) all influence individual differences in animal attitudes (Mathews and Herzog, 1997).

Less is known about the relationship between personality traits and attitudes about non-human animals. In 1993, Broida et al. found that college undergraduate students that were characterized as "intuitive and feeling types" by the Myers-Briggs Type Inventory (MBTI) were more in favor of animal experimentation than "sensate and thinking types" (Broida et al., 1993; Mathews and Herzog, 1997). When performing a similar study using the Sixteen Personality Factor Inventory, Mathews and Herzog (1997) found that the personality factors of sensitivity and imaginativeness were significantly correlated with attitudes toward animals.

Studies utilizing the Five Factor Model (FFM) of personality have found similar results. The most consistent predictor in most every study was the personality trait of agreeableness (Austin et al., 2005; Furnham et al., 2003; Signal and Taylor, 2007). Because agreeableness is associated with being compassionate, tender-minded and empathetic, it makes perfect sense that agreeable people are more sensitive to the pain in others—either human or non-human (McGowan et al., 2012). This correlation was found in many of the studies about animal welfare or animal research (Furnham et al., 2003).

The traits of extraversion, openness and neuroticism were also significantly associated with attitudes towards animals (Austin et al., 2005; Bagley and Gonsman, 2005; Ellingsen et al., 2010; Furnham et al., 2003). Conscientiousness, however, varied between studies. In Austin et al.'s 2005 study on farm animal welfare, conscientiousness was associated with a higher likelihood to read and to be aware of welfare information; however, in Furnham et al.'s 2003 study on animal research, conscientiousness was not a significant predictor.

Personality

The consensus on the definition of personality has varied amongst personality psychologists for as long as the discipline has existed. According to John D. Mayer, who held a conference on "Asserting the Definition of Personality" in 2007, although it is worded differently by various psychologists, the central idea behind the definition of personality remains the same: "personality is a system of parts that is organized, develops, and is expressed in a person's actions" (Mayer, 2007, p. 1). The "system of parts" includes motives, emotions, mental models, and the self (Mayer, 2007). Authors of five different textbooks were present at the conference and all of the definitions found in their books were similar. For example, *Personality psychology: Domains of knowledge about human nature* defines personality as "the set of psychological traits and mechanisms within the individual that are organized and relatively enduring and influences his or her interactions with, and adaptations to, the intrapyschic, physical and social environments" (Larsen and Buss, 2005, p. 4), while *Personality: Theory and Research* defines personality as referring to "those characteristics of the person that account for consistent patterns of feelings, thinking, and behaving" (Pervin, Cervone and

John, 2005, p. 6).

      Personality arises from within an individual person and usually remains fairly constant throughout a person's entire life. There are four characteristics of personality that are generally agreed upon by contemporary personality psychologists: consistency, psychological and physiological aspects, impacts on behaviors and actions, and multiple expressions (Costa and McCrae, 1992; Digman, 1990; Chapman, 2011). Personality is consistent, and there is usually a decipherable order and pattern to behavior; so people act in the same or similar ways in a variety of situations (Cherry, 2012a; Kazdin, 2000). Personality is both psychological and physiological. Personality is driven not only by psychology but also driven by a person's biological processes and requirements such as hormones, like testosterone and cortisol, and neurotransmitters, like epinephrine, norepinephrine, dopamine and serotonin (Cherry, 2012a; Kazdin, 2000). Personality also affects both behaviors and actions. Not only does personality affect how people respond to their environment, but it also causes people to act in certain ways (Cherry, 2012b, Kazdin, 2000). Finally, personality is displayed in multiple expressions. Personality is seen in more than just behavior, it can also be observed in thoughts, feelings, close relationships and other social interactions (Cherry, 2012b; Kazdin, 2000). The study of personality focuses on two expansive areas: the first is the quest to understand individual differences in certain personality traits, like nervousness or sociability, and the second is the investigation of how the many parts of a person come together as a whole (Kazdin, 2000).

Personality Trait Models

Personality researchers have long had models to describe the different aspects of human personality. Trait theorists have suggested many models, such as Gordon Allport's list of 4,000 personality traits, Raymond Cattell's sixteen trait theory, or even Hans Eysenck's three-factor theory (Allport and Odbert, 1936; Cattell, 1946; Eysenck, 1964). However, these models were either too complicated or not extensive enough and only added to the confusion and controversy of generating the perfect personality model (McCrae and John, 1992). It was surprising when, in 1961, Tupes and Christal discovered five persistent factors in personality ratings in eight independent samples.

Regardless of Tupes and Christal's work—and also the more widely publicized replication study done by Norman in 1963—many personality psychologists were unaware of the importance of these five factors throughout the majority of the 1960s and the 1970s (McCrae and John, 1992). By the 1980s, however, personality researchers from countless backgrounds and empirical traditions were led to accept that these factors were fundamental aspects of personality seen in self-reports and ratings; in natural languages and theoretically based questionnaires; in children, college students, and older adults; in men and women; and in English, Dutch, German and Japanese samples (John, 1990; McCrae and John, 1992). Each of the five factors was found to express convergent and discriminant validity across mechanisms and observers, and to endure across decades in adults (McCrae and Costa, 1990; McCrae and John, 1992). The new consensus grew rapidly, and, as a result, the five-factor model (FFM) emerged to describe the basic traits that serve as the building blocks of personality and is the model that many contemporary personality psychologists use today (Cherry, 2012).

The Lexical and Questionnaire Traditions

The pathway that led to the five-factor model was dominated by two different approaches: the lexical tradition and the questionnaire tradition. Although historically the lexical approach was responsible for the guidance of the questionnaire approach, it is possible that the questionnaire method may have eventually developed on its own.

It is common knowledge that the FFM originated in the studies of natural language trait terms (John et al., 1988; McCrae and John, 1992). Historically, Allport and Odbert (1936) abstracted terms from the dictionary; Cattell (1946) placed the words into synonym clusters and then made rating scales using categories of adjectives; Tupes and Christal (1961) acquired observer ratings on the thirty-five scales and factored them; and Norman then used the twenty best scales from the Tupes and Christal studies to perform his own replications, leading to the scales' use in many consequential studies (McCrae and John, 1992). Throughout the 1960s and 1970s, the FFM model was exiled; however, reanalyses of datasets by Digman and Takemoto-Chock (1981) and the new analyses of Goldberg (1981, 1982) led to a renewed interest in the FFM and the lexical approach (McCrae and John, 1992).

Starting the search for personality dimensions in natural language is an extremely helpful tool in personality psychology. For an ordinary person, personality is described in such terms as "friendly", "responsible", or "excitable" (McCrae and John, 1992). These, and other terms, are the basic ways by which people describe and understand themselves. A complete personality theory must then explain the phenomena to which these terms apply in real life and the way the terms are used every day (McCrae and John, 1992). Due to the fact that psychologists often rely on self-reports and peer-evaluations

to obtain data, the researchers must speak and be familiar with the language of their informants (McCrae and John, 1992).

Taken further, the study of natural language trait terms represents an even more important aspect of personality psychology. The fact that traits are important leads to the observation that traits are thoroughly represented in natural languages; in fact, Allport and Odbert (1936) recorded approximately 4,500 trait words in the English language alone—certainly such a vast quantity of personality-related vocabulary confirms the social significance of personality traits (McCrae and John, 1992). According to the lexical hypothesis, all of the important differences found in individuals will have been observed and recorded at some point in the evolution of language and thus encoded in the language as trait terms; by studying these terms (e.g. "friendly," "excitable," etc.), psychologists can deduce the basic dimensions of personality (McCrae and John, 1992). Thus, the use of the lexical approach gives a broad taxonomy of personality traits (McCrae and John, 1992).

If it is then assumed that personality traits are universal across all cultures and races, then it should hold true that the same basic personality factors can be found in all natural languages and there is some evidence of this. When the rating scales composed by Norman were translated into German (Borkenau and Ostendorf, 1990), Japanese (Bond et al., 1975) and Chinese (Yang and Bond, 1990) similar factor trends were observed (McCrae and John, 1992). Although five personality factors were found in Chinese, a one-to-one correlation to those found in English was not observed (Yang and Bond, 1990); however, the extensive study of German trait adjectives provided an almost perfect replication of the English language studies (McCrae and John, 1992; Ostendorf,

1990).

Although the lexical approach has played a role in the history of personality research, the majority of personality assessment has been conducted through questionnaires with scales designed for specific practical applications or to measure certain aspects of personality theories (Goldberg, 1971; McCrae and John, 1992). It might be assumed that since personality theories have been extremely diverse, that the questionnaire methods used to test the theories would be of little resemblance to each other; however, a fair amount of redundancy throughout the scales can be observed (McCrae and John, 1992). For example, many of the scales focus on the persistent negative emotions that are important to clinical psychologists or on the intricate interpersonal relationships studied by many social psychologists (McCrae and John, 1992). Because of these similarities, it was widely agreed upon throughout the psychological community that the factors of neuroticism (N) and extroversion (E) were essential dimensions of personality (H. J. Eysenck and S. B. G. Eysenck, 1964, 1975; McCrae and John, 1992). Through the contributions of Leary (1957), Tellegen and Atkinson (1974), Costa and McCrae (1976) and Tellegen (1982), the remaining dimensions of agreeableness (A), openness (O), and conscientiousness (C) were added to the scale (McCrae and John, 1992). It was after the scale was completed that the lexical and questionnaire approaches merged and became the five-factor model (FFM) as it is today (McCrae and John, 1992).

The Five-Factor Model

The five-factor model (FFM) consists of the theorized personality traits of neuroticism, extraversion, agreeableness, conscientiousness, and openness (Austin et al.,

2005; Chapman, 2011; Furnham et al., 2004; Matthews and Herzog, 1997). Neuroticism is associated with irritable and temperamental behaviors and is often associated with emotional instability (Grice, 2006). Extraversion is associated with lively, confident and sociable behaviors; and agreeableness is indicated in kind, caring and sympathetic mannerisms (Grice, 2006). Conscientiousness refers to the level of responsibility and prescience a person possesses, while openness, also referred to as intellect, indicates an individual's level of contemplation and propensity for intellectually stimulating activities (Grice, 2006). Each of the five personality types represents a range between two extremes. For example, extraversion corresponds to a continuum from extreme extraversion to extreme introversion; in reality, most people fall somewhere between the two ends of each personality dimension. Studies done have shown that the five traits are not only universal across different cultures, but also that the five personality dimensions may have biological origins (Cherry, 2012b; McCrae and John, 1992).

Neuroticism

In the personality psychology field, there is probably the least amount of disagreement over the definition of neuroticism (N). N symbolizes the propensity of individual differences in the ability to perceive stress and the cognitive and behavioral styles that result from these tendencies (McCrae and John, 1992). Research has shown that high N scores are often correlated with increased negative stress and an increased tendency to experience psychiatric disorders (McCrae and John, 1992; Watson and Clark, 1984; Zonderman et al., 1989). The nervous tension, depression, irritation, guilt and self-consciousness that many individuals who score high in N experience is often associated with irrational thinking, low self-esteem, poor impulse and craving control, somatic

complaints and ineffective coping mechanisms (McCrae and Costa, 1987; McCrae and John, 1992). However, a low N score does not denote high mental health, but rather indicates that the individual may be calm, relaxed, composed and levelheaded (McCrae and John, 1992).

Extraversion

Although the designation of extraversion (E) has long been used in personality psychology, the consensus about its definition is rather varied. Most of the disagreements around the description of E can be traced to the fact that both E and agreeableness (A) make up the Interpersonal Circumplex—which is a model for organizing, conceptualizing, and accessing interpersonal behaviors, traits and motives, around which interpersonal terms are arranged evenly (McCrae and John, 1992; Wiggins, 1979). The traditional orthogonal axes of the circumplex include the vertical axis of status, power, dominance and control and the horizontal axis of solidarity, warmth, friendliness and love; the major concern about E is associated with E's alignment with these axes (McCrae and John, 1992; Wiggins, 1979). Wiggins (1979), guided by interpersonal tradition and Goldberg (1990), guided by lexical analyses, identify E with Dominance; while, McCrae and Costa (1989) describe its position as midway between Dominance and Warmth, a position designated as I' (McCrae and John, 1992).

The main advantage of the I' position is that it aligns E with the noninterpersonal aspects of positive emotionality (McCrae and John, 1992). In their contribution to the issue, Watson and Clark (in press) theorize that positive and negative emotions are not opposites, but orthogonal dimensions that define an affective plane (McCrae and John, 1992). People who are positive, lively, cheerful and outgoing are not necessarily low in

anxiety and depression—these traits are defined by the individual's level of N—but, cheerful, happy people are more likely to be dominant, loquacious, and warm; indicating that positive emotionality is the core of E (McCrae and John, 1992). Watson and Clark (in press) further define E with the seven components of: venturesomeness, affiliation, positive affectivity, energy, ascendance, and ambition (McCrae and John, 1992).

Agreeableness

Although the label agreeableness (A) has been almost universally accepted, Digman (1990) notes that, "Agreeableness…seems tepid for a dimension that appears to involve the more humane aspects of humanity—characteristics such as altruism, nurturance, caring and emotional support at one end of the dimension, and hostility, indifference to others, self-centeredness, spitefulness, and jealousy at the other" (pp. 422-424) (Digman, 1990; McCrae and John, 1992). The label of "Friendly Compliance versus Hostile Noncompliance" by Digman and Takemoto-Chock (1981) and "Agreeableness versus Antagonism" by Graziano and Eisenberg (in press) offered different descriptions of A. However, since A must be orthogonal to E, the interpretation of A is dependent on one's description of E. Costa et al. (1991) note many attributes that blur Warmth and Submission, including trust, modesty and compliance (McCrae and John, 1992).

Conscientiousness

Conscientiousness (C), is a highly evaluated factor—understandable considering that A and C are the classic dimensions of a character; describing "good" versus "evil" and "strong-willed" versus "weak-willed" people (McCrae and John, 1992). Both of these factors are extremely observable characteristics of individual differences; some

people are thorough, neat, achievement-orientated, organized and diligent while others are not, and these characteristics are easily identified by self or peer evaluations (McCrae and Costa, 1987; McCrae and John, 1992).

Openness

The largest degree of controversy and disagreement amongst personality psychologists is in the interpretation of openness (O), and the controversy can be traced to differences within lexical and questionnaire studies. In lexical studies of trait adjectives in English (Goldberg, 1990; John, 1990) and in German (Ostendorf, 1990), O is normally defined by such items as intelligent, imaginative, and perceptive, leading many researchers—such as Fiske (1949), Hogan (1986) and Digman (1990)—to conclude the factor as some form of intellect (McCrae and John, 1992). However, many traits that are related to O are not found as single words in the English language. For example, there is no single word in English that means "sensitive to art and beauty" (McCrae, 1990; McCrae and John, 1992). As such, researchers using questionnaires have found a much broader view of O that includes creative and intellectual interests, differentiated emotions, aesthetic sensitivity, need for variety, and unconventional values (McCrae and John, 1992). This larger concept can be attributed to Rogers (1961), Rokeach (1960), Coan (1974) and McCrae and Costa (in press), who have argued that O is seen structurally in the intensity, range and permeability of consciousness and motivationally in the need of variety of experience (McCrae and John, 1992). In O, ideas form a significant aspect of consciousness; however, fantasies, feelings, sensations, and principles are also experiences to which people can be more or less open (McCrae and John, 1992).

It is important to note, that neither Openness or Intellect is equivalent to measured intelligence; O is not a measure of intellectual ability but rather a dimension of personality and many people score high in O without having a correspondingly high IQ score (McCrae and John, 1992).

Animal Welfare Attitudes

The association between personality, behavior and attitudes of people has been researched extensively (Austin et al., 2005). A large body of work has shown that personality can be linked to behavior in logical ways; studies have found that conscientiousness has a positive correlation with health-protective actions and career achievement (Austin et al., 2005; Bermúdez, 1999; Booth-Kewley and Vickers, 1994; Hurtz and Donovan, 2000). Furthermore, a large amount of literature has been amassed based on the thought that attitudes and values can be used to predict behavior (Austin et al., 2005). Research has been done on the relationship between personality and attitudes to animals, and evidence is available on the relationship between personality and health, ideology, close relationships and consumption; furthermore, studies have shown a correlation between personality and animal ownership (Bagley and Gonsman, 2005; Evan and MacKenzie, 2012; Furnham and Heaven, 1999; Furnham et al., 2003; Gunter, 1999; Hergovich et al., 2011).

In 2004, Serpell summarized the common findings of previous literature on attitudes to animals. He hypothesized the existence of two primary motivational dimensions underlying attitudes to animals, which he calls "affect" and "utility," with the first covering affective responses (like vs. dislike) and the second covering the perception of how valuable or disadvantageous to human interests a certain species is (Austin et al.,

2005; Serpell, 2004). Although personality measures are not usually seen in animal welfare studies, one study found that sensitivity and imaginativeness were linked to positive attitudes towards animals (Austin et al., 2005; Mathews and Herzog, 1997).

The Animal Production Industry

There is a significant body of work on the attitudes and personality of farmers or other people involved in the animal production industry and their views on animal welfare—particularly in farm animals (Austin et al., 2005; Kauppinen et al., 2012). A number of small studies were conducted on individual differences between farmers and other animal handlers focused on animal welfare; however, these studies have mostly examined the relationship between the human attitudes and style of interaction with the animals and the productivity of the animals themselves (Austin et al., 2005; Kauppinen et al., 2012). In Kauppinen et al.'s study on the correlation of farmer animal welfare attitudes and piglet production parameters, it was found that farms with good results in production parameters were also the farms in which the farmers had more positive attitudes, subjective norms and perceived behavioral control in practices that related to animal welfare (Kauppinen et al., 2012). Furthermore, farmers who possessed the most positive animal welfare attitudes were found to gain 0.34-0.54 more piglets per litter compared to the average farmer (Kauppinen et al., 2012). The results indicated a causal pathway between a farmer's attitude to the animals and their welfare and the animals' level of production.

Findings show that farm animals' fear of humans is negatively correlated with productivity and that positive attitudes of the handlers to the animals were associated with less negative handling behavior and lower disease levels in calves when positive

animal welfare techniques were used (Austin et al., 2005; Breur et al., 2000; Hemsworth et al., 1989; Hemsworth et al., 2000; Lensink et al., 2001). Furthermore, in a study done on the relationship between the stockperson's personality and attitudes and the productivity of dairy cows, the personality traits of agreeableness and conscientiousness were most strongly associated with positive attitudes towards working with dairy cows (Hanna et al., 2009). While personality traits were not correlated with milk yield, three attitudes scales were significantly correlated with milk yield; i.e., with higher levels of empathy and job satisfaction and lower levels of negative beliefs (Hanna et al., 2009).

Although not much study has been done on personality and farm animal welfare, a study of Scottish farmers provided a detailed description of the associations between farmer attitudes, personality and business conduct (Austin et al., 2005; Willock et al., 1999a). The results indicated an association between production-orientated behavior with the personality traits of conscientiousness, openness and extraversion and with open and accomplishment-orientated farming outlooks (Austin et al., 2005; Austin et al., 2001; Austin et al., 1998; Willock et al., 1999b).

Laboratory Animal Research

Large scale studies done on attitudes to animal welfare have generally focused on targeted groups such as students or the general public (Austin et al., 2005; Furnham et al., 2003). Many of these studies have researched the relationship between personality and attitudes toward laboratory animal experimentation (Furnham et al., 2003; Swami et al., 2008). In order for the examination of personality differences in laboratory animal research to be studied, it is first necessary to determine the formation of public attitudes regarding animal research. In a 2012 study done in Denmark, different ways of dealing

with the conflict between animal welfare and possible human benefits gave rise to three different attitudinal stances on animal research: Disapprovers, Reserved and Approvers (Lund et al., 2012). Although these stances are grounded in stable underlying values, they leave room for variable interpretations on the different types of animal research; thus creating the potential of shifts between disapproval and approval, particularly for the Reserved who experience ambivalence on the subject matter (Lund et al., 2012).

Investigating attitudes toward animal testing has been a very popular area of study. In an international study, 185 British and 143 American undergraduates completed an array of tests that measured general attitudes toward animal testing and animal welfare and conditions of testing (Swami et al., 2008). Although overall the results indicated support for the testing of animals under the appropriate conditions, a concern was also raised over the welfare of the animals and the conditions under which the testing took place (Swami et al., 2008). Small, but significant, national differences in both factors were also measured—Americans were more positive about testing and less positive about animal welfare conditions—and a sex difference in the first factor with women being less positive about testing (Swami et al., 2008). However, correlation and regression analyses showed little significance in the individual difference factors (Swami et al., 2008).

Studies have also focused specifically on animal attitudes and personality traits (Broida et al., 1993; Furnham et al., 2003; Mathews and Herzog, 1997). Using the Myers-Briggs Type Inventory (MBTI) personality factors of sensation, intuition, feeling and thinking, Broida et al. (1993) examined personality and attitudes to animal research (Broida et al., 1993; Furnham et al., 2003). The results showed that extraverted, thinking

types who also happened to be male, masculine, conservative and less empathic were in favor of animal experimentation; while intuitive and feeling types, vegetarians, more ecologically concerned and those more likely to come across animal experimentation in their studies were anti-vivisectionists and animal rights advocates (Broida et al., 1993; Furnham et al., 2003). Broida et al. (1993) noted:

> "Animal rights advocates tended to be intuitive and feeling types. Thus, they might be expected to be less interested in the process of reductionist scientific exploration, more concerned with how the results are used and future possibilities. In contrast, the sensate and thinking types, characteristics of pro-vivisectionists, would tend to focus on the mechanisms and process of obtaining new information." (p. 142)

In Mathews and Herzog's (1997) study using the 16 Personality Factor inventory to explore the attitudes toward the treatment of animals in American college students, only a small correlation between two of the 16 factors was found: tender-minded, imaginative instead of tough-minded, practical students were compassionate to animals (Furnham et al., 2003; Mathews and Herzog, 1997).

Finally, in Furnham et al.'s (2003) study done on personality and attitudes to laboratory animal welfare, it was found that negative attitudes to the use of animals in laboratory research was positively correlated with the personality traits of agreeableness and openness and negatively correlated with the personality trait of extraversion; whereas the liking of animals and the belief that they have feelings and thoughts was positively associated with the personality trait of openness (Furnham et al., 2003).

Empathy and Individual Differences

Many studies conducted on animal welfare attitudes, be they farm or laboratory animal research, have included empathy factor variables in their attitude assessments (Austin et al., 2005; Furnham et al., 2003; Hanna et al., 2009, Mathews and Herzog, 1997). Further work with empathy towards animals, specifically identification and sympathetic reactions toward animal pain and suffering, has lead to a growing body of literature on the subject (Ellingsen et al., 2010; Lee et al., 2010; Lee and Quarles, 2012;).

In 2007, NFL Quarterback Michael Vick pled guilty to federal felony charges for being implicated in an illegal interstate dog-fighting ring, garnering much attention by the public (*United States v. Vick,* 2007). Even though many people who watched the footage provided by media sources of the abused dogs in the Vick case may have felt sympathy for them, the individual characteristics associated with these people were unknown (Lee et al., 2010). In a study done by Lee et al. (2010) personality and gender were examined as predictors of sympathetic attitudes to the mistreatment of a bait dog in a provided film clip (Lee et al., 2010). The results showed that animal-related sympathy, trait sympathy, agreeableness and gender predicted sympathetic reaction to the dogs (Lee et al., 2010). Although analyses showed that trait sympathy was unable to explain unique variance beyond animal-orientated sympathy, agreeableness successfully mediated the relationship between gender and sympathetic reactions to the bait dog (Lee et al., 2010). Unexpectedly, emotional stability also was a unique predictor—which may or may not correlate to the personality trait of neuroticism (Lee et al., 2010).

Since the 2007 Michael Vick dog-fighting case, much attention has been focused

on cruelty towards dogs; however, cockfighting roosters have been practically ignored by both scientists and the general public (*United States v. Vick,* 2007). In a 2012 study, Lee and Quarles examined the influence of feelings, belief in animal mind, personality and empathy related traits in sympathy towards cock-fighting roosters. The results were strong, with 51% of the variation in sympathy reactions to cock-fighting roosters being explained by individual difference variables (Lee and Quarles, 2012). Significant predictors emerged in feelings toward roosters, extraversion, conscientiousness, and trait sympathy for animal suffering, while belief in animal mind had no significant effect (Lee and Quarles, 2012).

Many factors affect human-animal interactions, including empathy, attachment level, anthropomorphism, belief in animal mind and attitudes towards pets (Ellingsen et al., 2010; Lee and Quarles, 2012). In Ellingsen et al.'s 2010 study, the relationship between empathy, attitudes and perceived animal pain in the typical Norwegian dog owner was assessed through the dissemination of questionnaires including four parts: demographics, the Pet Attitude Scale (PAS), the Animal Empathy Scale (AES), and the Pain Assessment Instrument (PAI) (Ellingsen et al., 2010). For the PAI, the study participants were presented with 17 images of dogs in varying degrees of pain situations and asked to rate the level of pain they felt the animal was experiencing using the Visual Analogue Scale (VAS) (Ellingsen et al., 2010). The results showed that, although there were differences based on gender, childhood pet ownership, income, education and the use of the dog (companionship or hunting), Norwegian dog owners had high levels of empathy toward animals and equally high levels of positive attitudes towards pets (Ellingsen et al., 2010). The correlation between high animal empathy levels and high

positive attitudes towards pets was strong (r = 0.58) and was the best indicator of how participants rated the pain in dogs (Ellingsen et al., 2010).

The strength of the relationship between a human and an animal, especially in pets, can at times work against animal pain perception. Because the human-horse bond is very unique and often strengthened by years of ownership, the decision for euthanasia is often extremely difficult and distressing for horse owners (McGowan et al., 2012). In a study done on owners of 350 aged horses in South East Queensland, Australia, a questionnaire was distributed that measured personality and the degree of distress concerning euthanasia (McGowan et al., 2012). The results indicated that most horse owners found the decision to euthanize their horse distressing and difficult and based their decision on considerations of the horse's health, anticipated future quality of life and veterinary advice (McGowan et al., 2012). McGowan et al. (2012) found that female owners who found it more difficult to make a decision were often categorized as neurotic personality types and based their decision more on their relationship with the horse and the horse's quality of life. Because veterinarians play a crucial role in not only the diagnosis of health factors that influence the decision to euthanize the horses found in this study—and the majority of pets worldwide—it is important that they be sensitive to the distress the owner is feeling, due more to the loss of their animal rather than the act of euthanasia itself (McGowan et al., 2012).

METHODOLOGY

Ninety-seven undergraduate students from the University of Nevada, Reno participated in the current study. The majority of the participants were pursuing majors

in veterinary or other science related fields. During the last twenty minutes of three University classes that the professors teaching the class allowed the surveys to be distributed in, participants in the courses completed the survey instrument consisting of a covering information sheet, Donnellan et al.'s (2006) Mini-International Personality Item Pool (IPIP) Scale and Herzog et al.'s (1991) Animal Attitude Scale (AAS) (Appendix A). It was disclosed that there would be no direct benefits to the participants but the information gathered would be beneficial in both the psychological and veterinary fields. The participants were informed that although their participation in the study would be greatly appreciated, it was not required and there would be no repercussions for declining to participate in the study. To decline, the survey was distributed to each student and those who were not interested in participating in the research were instructed to simply turn in blank surveys; completed surveys implied consent. The surveys were collected after the participants placed their surveys face down on their table or desk, to insure protection to the participants' privacy, and exited the room. The answers themselves were confidential and were not connected to the participants. Due to suggestions by the Institutional Review Board (IRB), further confidentiality was provided by not having any identifiable demographics such as name, age, sex or education level included in the survey.

Five Factor Model Questionnaire Scales

Due to the popularity of the questionnaire approach in assessing personality factors, many different scales have emerged over the years. However, many of these scales are long and detailed. Even though investigators often want to cover a wide range of factors in their research, completing a large packet of questionnaires can be boring and

frustrating to participants, leading to measurement errors due to negative moods (Donnellan et al., 2006). Furthermore, even a mildly unpleasant research experience due to a long questionnaire may cause a participant to decide not to complete the study, decline to participate in further longitudinal studies, or refuse to take part in future studies (Donnellan et al., 2006). For these reasons, several short FFM questionnaires have been developed over the years; such as, the 60-item NEO Five-Factor Inventory (NEO-FFI; Costa and McCrae, 1992), the 50-item International Personality Item Pool – Five-Factor Model (IPIP-FFM; Goldberg, 1999), the 44-item Big Five Inventory (BFI; John and Srivastava, 1999) and the 40-item Big Five Mini-Markers (Saucier, 1994) (Donnellan et al., 2006). The majority of these scales were still too long however, leading to Gosling et al.'s (2003) development of the Ten-Item Personality Inventory (TIPI) of the Big Five which, although effective, was considered by many to be too unreliable to obtain sufficient internal consistencies or practical content due to the fact that it only contained two items per scale (Donnellan et al., 2006; Saucier and Goldberg, 2002).

The Mini-International Personality Item Pool Scale (Mini-IPIP)

As such, Donnellan et al. (2006) constructed a short inventory of the Big Five scale in which they shortened the 50-item IPIP-FFM—due to the fact that it is frequently used in personality research and is readily available to researchers at no cost (Donnellan et al., 2006). In accordance to measures set by Saucier and Goldberg (2002, p. 43-44) a 20-item Mini-IPIP scale was constructed with four items per Big Five scale, since four items serves as a "practical minimum" (Donnellan et al., 2006; Saucier and Goldberg, 2002). Furthermore, because of Saucier and Goldberg's (2002) recommendation that the scales be balanced with equal numbers of positively and negatively keyed items, the

Mini-IPIP scale has two items keyed in the positive direction and two items keyed in the negative direction for each of the Big Five—except for O, which was composed of three negatively keyed items and one positively keyed item (Donnellan et al., 2006; Saucier and Goldberg, 2002).

Through testing of the Mini-IPIP scale, it was concluded by Donnellan et al. that the Mini-IPIP had acceptable internal consistencies across five studies, similar coverage of all facets of the Big Five as other larger scales, and test-retest measures that were similar to parent measures across several weeks and months (Donnellan et al., 2006). Furthermore, the Mini-IPIP scale showed a similar pattern of convergent, discriminant and criterion-related validity as other Big Five measures, indicating that the Mini-IPIP is a psychometrically suitable and practically useful measure of five-factor personality traits (Donnellan et al., 2006).

Because the Mini-IPIP scale is only a twenty question scale—as opposed to other fifty item or more scales—and it does not take a great deal of time to complete, the Mini-IPIP was used as the personality measuring tool in this study.

The Animal Attitude Scale (AAS)

Developed by Herzog et al. in 1991, the Animal Attitude Scale (AAS) is a tool for assessing individual differences toward the treatment of animals (Mathews and Herzog, 1997). The original scale was composed of twenty-nine items which participants would rate their answers to on a five-point Likert scale (*Strongly Agree* to *Strongly Disagree*) (Herzog et al., 1991; Mathews and Herzog, 1997). Originally, items numbered 21 to 29 were used as a subscale to measure the degree to which people were willing to help animals in distress; however, further factor analysis by the authors indicated that all of

the items in the scale fell into one factor and so the items were eliminated from the AAS (Herzog et al., 1991). Samples of the remaining questions included: *There is nothing morally wrong with hunting wild animals for food"* and *"The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped".* The alpha of the present version of the scale is usually around .90 (Herzog et al., 1991). In previous studies, it has been found that factors that tend to influence scores include gender and sex-role orientation (Herzog et al., 1991), empathy (Galvin and Herzog, 1994), personal moral philosophy (Galvin and Herzog, 1992) and beliefs about an animal's ability to experience mental states (Herzog and Galvin, 1997) (Mathews and Herzog, 1997).

Because the AAS is a fairly short questionnaire and has high internal consistencies (Mathews and Herzog, 1997), it was used for assessing animal attitudes in the current study.

RESULTS

Table 1. Number of participants classified as each personality trait and correlations between the five personality factors and the Animal Attitude Scale.

FFM Factor	N	r
Extroversion (E)	10	-0.2550
Agreeableness (A)	35	-0.0466
Conscientiousness (C)	25	0.0634
Neuroticism (N)	2	*
Openness (O)	25	-0.0688
Total	97	

* Indicates insufficient data collection to perform a correlation analysis

Table 1 (Number of participants classified as each personality traits and

correlations between five personality factors and the Animal Attitude Scale) shows the Pearson product-moment correlations between the personality factors measured by the FFM and AAS scores. The correlations on the table are between the personality factor on the left side and higher scores on the AAS. For example, a statistically significant positive correlation between the first factor (extroversion) would indicate that the FFM trait of extroversion was associated with high pro-animal attitudes; whereas, a negative correlation would indicate that extroversion was associated with low pro-animal attitudes. Overall, the correlations between personality traits and attitudes toward the treatment of animals were low and none were statistically significant (Table 1). The personality traits of extroversion (r = -0.2550), agreeableness (r = -0.0466) and openness (r = -0.0688) showed a negative correlation with high AAS results, while conscientiousness (r = 0.0634) showed a positive correlation with high AAS results; however, none of the correlations proved to be significant (Table 1). Out of ninety-seven completed surveys, only two participants were classified with the FFM trait of neuroticism which was an insufficient number to run a Pearson product-moment correlation analysis on this particular trait (Table 1).

Regression analysis was used to assess the relative importance of personality variables in explaining individual differences in animal welfare attitudes. The regression was conducted with AAS scores entered as the dependent variable and FFM scores entered as the independent variable. The analysis indicated that none of the variables was significant predictors of animal attitudes.

Table 2. Descriptive statistics showing the score differences between the results of the five personality factors.

	M	SD	Minimum	Maximum
Extroversion (E)	12.96	3.65	6	19
Agreeableness (A)	16.19	2.66	7	20
Conscientiousness (C)	14.89	3.13	6	20
Neuroticism (N)	10.52	3.02	4	18
Openness (O)	15.91	2.41	9	20
Total				97

The majority of participants were classed in "agreeableness" ($N = 35$) and the least amount of participants were classed in "neuroticism" ($N = 2$) (Table 1). Table 2 (Descriptive statistics showing the score differences between the results of the five personality factors) shows the differences in the overall results obtained from each personality dimension. The results indicate that agreeableness had the highest average score ($M = 16.19$, $SD = 2.66$) and neuroticism had the lowest average score ($M = 10.52$, $SD = 3.02$) (Table 2). The lowest standard deviation was associated with openness, which also had the second highest average score ($M = 15.91$, $SD = 2.41$) (Table 2). Neuroticism had both the lowest minimum and maximum scores (Minimum = 4, Maximum = 18) (Table 2). The highest minimum score of 9 was with openness, which also shared the highest maximum score of 20 with agreeableness and conscientiousness (Table 2).

Table 3. Descriptive statistics showing means and standard deviations of personality statements of the Mini-IPIP.

	M	SD
Personality Factor 1: Extroversion (E)		
6. I don't talk a lot*	3.35	1.29
16. I keep in the background*	3.34	1.12
11. I talk to a lot of different people at parties	3.32	1.16
1. I am the life of the party	2.96	1.19
Personality Factor 2: Agreeableness (A)		
2. I sympathize with other's feelings	4.44	0.644
17. I am not really interested in others*	4.12	0.832
7. I am not interested in other people's problems*	3.84	0.921
12. I feel others' emotions	3.78	1.05
Personality Factor 3: Conscientiousness (C)		
13. I like order	4.13	0.759
18. I make a mess of things*	3.78	0.971
8. I often forget to put things back in their proper place*	3.58	1.18
3. I get chores done right away	3.40	1.11
Personality Factor 4: Neuroticism (N)		
19. I seldom feel blue*	2.75	1.11
9. I am relaxed most of the time*	2.75	1.24
4. I have frequent mood swings	2.61	1.08
14. I get upset easily	2.38	1.03
Personality Factor 5: Openness (O)		
20. I do not have a good imagination*	4.16	0.898
5. I have a vivid imagination	4.04	0.815
10. I am not interested in abstract ideas*	3.89	0.848
15. I have difficulty understanding abstract ideas	3.80	0.799

* Indicates reverse worded question

Table 3 (Descriptive statistics showing means and standard deviations of personality statements of the Mini-IPIP) shows the differences in means and standard deviations of each personality question listed on the Mini-IPIP section of the survey. The question with the highest average score was number two (*I sympathize with other's feelings*) (*M* = 4.44, *SD* = 0.644), which was a question under the personality trait of agreeableness (Table 3). The question with the lowest average score was number fourteen (*I get upset easily*) (*M* = 2.38, *SD* = 1.03), which was under the personality trait of neuroticism (Table 3).

Table 4. Animal Attitude Scale results for all personality traits together.

Animal Attitude Scale Results	
Mean	59.68
Standard Deviation	9.79
Median	58
Mode	58
Standard Error	0.995
Sample Variance	96.01
Kurtosis	0.279
Skewness	0.108
Range	52
Minimum	33
Maximum	85

N=97. Score is out of a possible 100.

Table 5. Descriptive statistics showing the Animal Attitude Scale score differences and associated personality factors.

Animal Attitude Scale Results	E	A	C	N	O
M	52.90	61.49	56.84	64.50	62.32
SD	9.24	7.96	10.55	13.43	10.09
Minimum	35	48	33	55	46
Maximum	67	80	85	74	84

E = Extroversion, A = Agreeableness, C = Conscientiousness, N = Neuroticism, O = Openness.

The highest score possible on the AAS section of the survey was 100. Table 4 (Animal Attitude Scale results or all personality traits together) shows that the average score on the AAS, not accounting for the different personality traits, was 59.68, with a standard deviation of 9.79. The highest and lowest scores obtained differed drastically, with the highest score being 85 and the lowest score being 33 (Table 4). When the personality dimensions were accounted for in Table 5 (Descriptive statistics showing the Animal Attitude Scale score differences and associated personality factors), neuroticism

had the highest average AAS score (*M* = 64.50, *SD* = 13.43); however, neuroticism only

had an *N* = 2, so it should be discounted (Table 5). The highest average would then be

openness (*M* = 62.32, *SD* = 10.09) (Table 5). Extroversion had the lowest average AAS

score (*M* = 52.90, *SD* = 9.24) (Table 5). The lowest minimum and highest maximum

scores, both with and without the personality dimensions factored in, belonged to

conscientiousness (Minimum = 33, Maximum = 85) (Table 4 and Table 5). The highest

minimum score belonged to neuroticism (Minimum = 55), or agreeableness

(Minimum = 48), if neuroticism is discounted (Table 5). Extroversion had the lowest

maximum score (Maximum = 67) (Table 5).

Table 6. Descriptive statistics showing mean and standard deviations of Animal Attitude
Scale questions.

	M	SD
12. In general, I think that human economic gain is more important than setting aside more land for wildlife*	4.08	0.986
14. Breeding animals for their skins is a legitimate use of animals*	3.98	0.946
3. There should be extremely stiff penalties including jail sentences for people who participate in cock fighting	3.92	0.986
10. The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work	3.84	0.898
18. The production of inexpensive meat, eggs and dairy products justifies maintaining animals under crowded living conditions*	3.77	0.919
4. Wild animals, such as mink and raccoons, should not be trapped and their skin made into fur coats	3.74	1.09
13. Too much fuss is made over the welfare of animals these days when there are many human problems that need to be solved*	3.59	1.06
9. Basically, humans have the right to use animals as we see fit*	3.52	1.00
1. It is morally wrong to hunt wild animals just for sport	3.47	1.38
17. It is unethical to breed purebred dogs for pets when millions of dogs are killed in animal shelters each year	3.05	1.00
19. The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped	3.04	0.919
11. I sometimes get upset when I see wild animals in cages at zoos	2.96	1.19
6. I think people who object to raising animals for meat are too	2.59	0.988

sentimental*		
2. I do not think that there is anything wrong with using animals in medical research*	2.51	1.05
20. The use of animals in rodeos and circuses is cruel	2.48	1.14
7. Much of the scientific research done on animals is unnecessary and cruel	2.19	0.917
15. Some aspects of biology can only be learned through dissecting preserved animals such as cats*	1.89	0.941
16. Continued research with animals will be necessary if we are to conquer diseases such as cancer, heart disease and AIDS*	1.78	0.753
8. I think it is perfectly acceptable for cattle and hogs to be raised for human consumption*	1.69	0.698
5. There is nothing morally wrong with hunting wild animals for food*	1.59	0.731

* Indicates reverse worded question

Table 6 (Descriptive statistics showing mean and standard deviations of Animal Attitude Scale questions) shows the differences in means and standard deviations of each of the AAS questions presented on the survey. Question twelve (*In general, I think that human economic gain is more important that setting aside more land for wildlife**), which was a reverse worded question, had the highest average score ($M = 4.08$, $SD = 0.986$) (Table 6). The lowest average score was seen with question five (*There is nothing morally wrong with hunting wild animals for food**), which was also a reverse worded question ($M = 1.59$, $SD = 0.731$) (Table 6).

DISCUSSION OF RESULTS

Pearson Product-Moment Correlations

None of the Pearson product-moment correlations between the FFM personality factors and high AAS scores showed statistically significant results; as such, there was not a significant correlation between FFM personality traits and animal welfare attitudes

(Table 1). The Pearson product-moment coefficient of correlation (r) is a sample statistic that reflects the amount of variability that is shared between two variables (personality and AAS score) and assumes a value between -1 and +1. A value close to zero would indicate little or no relationship, while a value of exactly -1 or +1 would indicate a perfectly linear relationship; so the closer the value gets to -1 or +1, the stronger the relationship. A positive r value would indicate a direct relationship, where both variables move in the same direction, whereas a negative r would indicate an indirect relationship, where the variables move in opposite directions. By performing a multiple regression test with $\alpha = 0.05$, the Analysis of Variance (ANOVA) output indicated that the results were not statistically significant and they could have occurred by chance alone.

Agreeableness Results

Although the results were not significant, the correlations yielded some surprising outcomes. In most of the previous studies using the FFM, agreeableness was the most significant predictor of pro-animal welfare attitudes (Austin et al., 2005; Furnham et al., 2003; Signal and Taylor, 2007). In Austin et al.'s 2005 study, agreeableness in university students was positively and significantly correlated with "Knowledgeable/Interactive" ($r = .26$), "Animal Individuality" ($r = .24$), and "Welfare Orientation" ($r = .26$). Regression analyses done in Furnham et al.'s 2003 study found that agreeableness was significant with high scores of "Empathic Concern," attitudes against animal research, attitudes against the use of animals for testing non-medical products, a willingness to take non-animal tested products and a desire to replace animals in experiments. However, results from the current study showed that agreeableness ($r = -0.0466$) not only has a negative correlation with high AAS scores, but it also has the weakest correlation out of

the factors measured (Table 1). The fact that the largest number of participants ($N = 35$) were classified under agreeableness and that agreeableness has the highest mean score of all the personality factors ($M = 16.19$) also show that, out of all the factors studied, agreeableness should have the most accurate correlation coefficient due to a larger sample size (Table 1 and Table 2). One explanation for the inconsistency in the current study with previous studies may be due to the variety of subject areas the participants in the current study were majoring in. In the two previous studies, the populations sampled were exclusively agriculture students (Austin et al., 2005) and psychology students (Furnham et al., 2003), while in the current study, students of multiple disciplines were sampled.

Openness Results

Further variation occurred concerning the trait of openness. Austin et al. (2005) found that openness was significantly correlated, either positively or negatively, with each animal empathy factor they studied. Overall, students who scored high in welfare dimensions tended to be high on the trait of openness and were associated with being receptive to new ideas (Austin at al., 2005). Openness was the second most consistent predictor in Furnham et al.'s (2003) study, where openness was correlated with the participants liking animals who the participants believed had feelings and being against the use of animals for testing non-medical products. In Mathews and Herzog's 1997 study of personality and attitudes toward animal attitudes, the Sixteen Personality Factor Questionnaire (16PF) was used to measure personality instead of the FFM. Mathews and Herzog (1997) found that the personality dimension of Imaginative ($r = 0.203$) was significantly correlated with attitudes toward animal welfare. High scores on the

Imaginative Factor of the 16PF tend to be associated with unconventional attitudes, and the factor of openness in the FFM is defined by imaginative and unconventional values; thus, the descriptions of the traits in relation to animal attitudes are similar (Krug, 1981; Mathews and Herzog, 1997; McCrae and John, 1992). However, in the current study, openness (r = -0.0688) had a negative correlation to high AAS scores, which may also be attributed to the range of subject areas the participants majored in (Table 1).

Extroversion Results

Unlike agreeableness and openness, the negative correlation between extroversion (r = -0.2550) and high AAS scores was consistent with previous studies (Broida et al., 1993; Furnham et al., 2003). In 1993, Broida et al. used the Myers-Briggs Type Inventory to look at personality in relation to animal research attitudes. Broida et al. (1993) found that extraverted, male, masculine, conservative, less empathic thinking types were more in favor of animal experimentation. Furnham et al. (2003) also found that extraversion was negatively associated with negative attitudes toward the use of animals in research. In the current study, extraversion had the strongest correlation (r = -0.2550) of all of the personality factors, showing that extroversion was the most likely to become a significant predictor (Table 1). Although—discounting neuroticism—extraversion had the smallest sample size (N = 10), the fact that extraversion had the lowest maximum score on the AAS (Max = 67) and the second lowest minimum score (Min = 35) indicates that extroversion followed the expected trend of low animal welfare attitudes (Table 1 and Table 5). The fact that only a small number of extroverts were found in the sample collected may be attributed to the students who participated; perhaps, students from the majors that were sampled are less likely to have extroverted

personalities. However, it can be reasonably hypothesized that if a larger sample size was obtained, extroversion would form a significant negative correlation with high AAS scores.

Conscientiousness Results

Conscientiousness ($r = 0.0634$) was the only positively correlated trait found in the current study (Table 1). In previous studies, correlations between conscientiousness and animal attitudes have varied (Austin et al., 2005; Furnham et al., 2003). In Austin et al.'s 2005 study, conscientiousness was correlated with high scores on general welfare-friendliness. Conscientiousness was also associated with diligence, rule-keeping and a higher likelihood to read welfare information and be familiar with welfare issues (Austin et al., 2005). However, Furnham et al. (2003) found that conscientiousness was not a significant predictor. Because Austin et al. (2005) found a positive correlation between conscientiousness and animal welfare attitudes, the fact that the current study showed a small positive correlation makes sense. The most interesting result concerning the factor of conscientiousness was that, both with and without the personality dimensions factored in, conscientiousness had both the highest maximum AAS score (85) and the lowest minimum AAS score (33) (Table 4 and Table 5). Although the significance of this fact is unknown, clearly more empirical research is needed concerning the trait of conscientiousness in order for more valid conclusions to be stated.

Neuroticism Results

In Furnham et al.'s (2003) previous study, neuroticism was a small predictor of attitudes toward animal research. Furnham et al. (2003) found that neuroticism was correlated with the belief that meat eating was cruel and unnecessary. However, in the

current study, the lack of a sufficient sample size ($N = 2$), prevented any adequate correlations to be drawn from the data. Due to the fact that neuroticism is characterized by high degrees of personal distress, irritation and guilt, it can be hypothesized that individuals characterized as neurotic would have higher animal welfare attitudes—especially in laboratory animal and empathy studies (McCrae and John, 1992). According to McCrae and John (1992), females have a higher tendency to be classified under the neuroticism factor than males. Due to the fact that females also tend to have higher animal welfare and empathy attitudes, and be anti-vivisectionists and animal rights activists, it is possible that a larger sample of neurotic females may have made neuroticism a significant positive predictor of animal welfare attitudes in the current study (Driscoll, 1992; Furnham et al., 3003; Gallup and Beckstead, 1988; Herzog et al., 1991; Hills, 1993; Kellert and Berry, 1987).

Mini-IPIP Results

In accordance with the fact that agreeableness had the largest sample size ($N = 35$) and neuroticism has the smallest sample size ($N = 2$), the personality questions associated with the highest and lowest averages were classified under agreeableness and neuroticism (Table 1 and Table 3). Question 2 (*I sympathize with other's feelings*) was under the category of agreeableness and had the highest average score ($M = 4.44$) (Table 3). It is not surprising that an agreeable question had the highest average, due to the fact that the majority of participants were categorized under agreeableness. Question 14 (*I get upset easily*) had the lowest average score ($M = 2.38$) and was under the neuroticism category (Table 3). It is interesting to note that while Question 14 had the lowest score overall, the other three questions (4, 9 and 19) under the neuroticism category were the next three

lowest scores overall (Table 3). This lends further evidence to the hypothesis that the sample pooled from had an insufficient number of neurotic personalities, which could indicate the majors in which the participants were enrolled in did not attract many neurotic personality types.

Animal Attitude Scale Results

A large degree of variation was found among the average scores for each of the questions making up the AAS (Table 6). The question with the highest average score was Question 12 (*In general, I think that human economic gain is more important than setting aside land for wildlife**), which was a reverse worded question with an average of 4.08 (Table 6). Although Question 12 does deal with an animal welfare issue, it is not as emotionally worded as other questions are (*e.g. The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work*; *Wild animals, such as mink and raccoons, should not be trapped and their skins made into fur coats; etc.*) (Table 6). The fact that Question 12 merely mentions "wildlife" and does not specifically name certain species may appeal to a broader base of people—such as hunters or conservationists, who might be more concerned with sustainability or environmental issues than the specific issue of animal welfare. Furthermore, because Question 12 refrains from the use of words like "slaughter," "trapped," or "cruel," it may encourage a greater logical, rather than emotional, thought process which may be a preferable method of dissecting the AAS questions. The question with the lowest average score was Question 5 (*There is nothing morally wrong with hunting wild animals for food**), which was also a reverse worded question with an average of 1.59 (Table 6). Because the subject matter of Question 5 regards hunting wild animals for the sole

purpose of human survival, it is easily the least controversial question on the AAS and a rational question to receive the lowest average score.

CONCLUSION

Due to constrictions placed on the current study by the IRB, variables such as gender, race and religious affiliation were not included in the current study so that the confidentiality of the participants may be secured. However, it would have been very interesting to have added demographic variables to the current study. Previous studies have found that females tend to have higher animal welfare attitudes than males and that non-religious people are more prepared to use non-animal tested products and be against animal experimentation (Driscoll, 1992; Furnham et al., 3003; Gallup and Beckstead, 1988; Herzog et al., 1991; Hills, 1993; Kellert and Berry, 1987). If demographic variables had been included, the results of the study may have shown a greater degree of significance.

It is important to note that because the current study was conducted using university students, like many other studies on the subject of personality and animal attitudes, the results do not represent the entire population who may be interested in animal welfare (Austin et al., 2005; Broida et al., 1993; Furnham et al., 2003; Mathews and Herzog, 1997, Swami et al., 2008). A number of studies concerning animal attitudes have been done using farmers, the general public and even animal rights activists (Austin et al., 2005; Ellingsen et al., 2010; Jasper and Nelkin, 1992; Kauppinen et al., 2012; McGowan et al., 2012; Plous, 1991). However, in the sociological and psychological studies done concerning animal rights activists, personality has not been taken into

account (Jasper and Nelkin, 1992; Mathews and Herzog, 1997; Plous, 1991). Although personality was not highly or significantly related to animal attitudes in the current study, it may be interesting to investigate whether the personality of committed animal rights activists—who generally have more extreme animal rights views—has any significant relationship to animal attitudes.

Among the participants in this study, personality differences—as measured by the Mini-IPIP scale—were only weakly related to attitudes toward animal welfare. None of the five FFM personality traits were significantly correlated with the AAS scores, which indicated that personality was not a major factor in determining the attitudes of a group of college-age students toward non-human animals. Thus, according to the data collected and analyzed in the current study, there is not a significant correlation between personality traits—as described by the FFM—and animal welfare attitudes.

Although the current study did not yield any statistically relevant conclusions, the results will add to the growing amount of literature on attitudes toward animals and animal welfare. Hopefully, the completion of the current study will spark the interest of other researchers fascinated by the important topic of animal welfare attitudes. More work on the subject of animal welfare and personality type will help add knowledge to both psychological and veterinary fields and will bring about new discoveries concerning human-animal relations—and perhaps the capacity of the human mind itself.

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Appendix A. Personality and Animal Attraction Scale Survey

Part 1. Survey Information Cover Sheet

Information Sheet for a University of Nevada, Reno Research Study

Title of Study: Predisposition of the Five Factor Personality Traits Associated with Animal Attraction
Investigators: Meaghan Greb (775) 225-8289 and Dr. Richard Simmonds, D.V.M., M.S. Director of Laboratory Animal Medicine (775) 742-7944.
Protocol #: 2013E056

PURPOSE
You are being asked to participate in a research study. The purpose of this study is to investigate the five major personality traits—as described by the five-factor model—and their connection to human affinity for non-human animals.

PARTICIPANTS
You are being asked to participate because you are an adult and a University of Nevada, Reno student. If you are under the age of eighteen years old you are not eligible to participate.

PROCEDURES
If you volunteer to participate, you will be asked to complete the attached survey and then place the survey face down on the table before exiting the room. If you do not wish to participate in the study, you may simply turn in a blank survey. Participation is voluntary and you have the right to withdraw at any time without penalty.

BENEFITS
There may be no direct benefits for participants but we hope to learn more about the relationship between human personality and animal attraction—which will be beneficial in both the psychological and veterinary fields.

CONFIDENTIALITY
Please do not write your name on the survey. This will allow us to protect your privacy. The Department of Health and Human Service (HHS) and the University of Nevada, Reno Institutional Review Board may inspect your study records. You will not be personally identified in any reports or publications that may result from this study. The data will be stored in protected files located in a locked cabinet for two years. This will allow plenty of time for collection, analysis and report preparation before the data are destroyed.

CLOSING STATEMENT
You may ask about your rights as a research subject or you may report (anonymously if you so choose) any comments, concerns, or complaints to the University of Nevada,

Reno Social Behavioral Institutional Review Board, telephone number (775) 327-2368, or by addressing a letter to the Chair of the Board; c/o UNR Office of Human Research Protection; 218 Ross Hall/331; University Of Nevada, Reno; Reno, Nevada 89557

Appendix A. Personality and Animal Attraction Scale Survey

Part 2. The Mini-International Personality Item Pool.

Below are a number of phrases, which describe people's behavior. Using the rating scale provided, describe how accurately each statement describes you. Please read each statement carefully, and circle the letters that indicate the extent to which you agree or disagree with the statement.

SA = Strongly Agree
A = Agree
U = Undecided
D = Disagree
SD = Strongly Disagree

1. I am the life of the party.	SA A U D SD
2. I sympathize with other's feelings.	SA A U D SD
3. I get chores done right away.	SA A U D SD
4. I have frequent mood swings.	SA A U D SD
5. I have a vivid imagination.	SA A U D SD
6. I don't talk a lot.	SA A U D SD
7. I am not interested in other people's problems.	SA A U D SD
8. I often forget to put things back in their proper place.	SA A U D SD
9. I am relaxed most of the time.	SA A U D SD
10. I am not interested in abstract ideas.	SA A U D SD
11. I talk to a lot of different people at parties.	SA A U D SD
12. I feel others' emotions.	SA A U D SD
13. I like order.	SA A U D SD
14. I get upset easily.	SA A U D SD
15. I have difficulty understanding abstract ideas.	SA A U D SD

16. I keep in the background.   SA A U D SD

17. I am not really interested in others.   SA A U D SD

18. I make a mess of things.   SA A U D SD

19. I seldom feel blue.   SA A U D SD

20. I do not have a good imagination.   SA A U D SD

Appendix A. Personality and Animal Attraction Scale Survey

Part 3. The Animal Attraction Scale

Below are a number of statements regarding the use of animals. Using the rating scale provided, describe how accurately you agree with each statement. Please read each statement carefully, and circle the letters that indicate the extent to which you agree or disagree with the statement.

SA = Strongly Agree
A = Agree
U = Undecided
D = Disagree
SD = Strongly Disagree

1. It is morally wrong to hunt wild animals just for sport.

SA A U D SD

2. I do not think that there is anything wrong with using animals in medical research.

SA A U D SD

3. There should be extremely stiff penalties including jail sentences for people who participate in cock fighting.

SA A U D SD

4. Wild animals, such as mink and raccoons, should not be trapped and their skin made into fur coats.

SA A U D SD

5. There is nothing morally wrong with hunting wild animals for food.

SA A U D SD

6. I think people who object to raising animals for meat are too sentimental.

SA A U D SD

7. Much of the scientific research done on animals is unnecessary and cruel.

SA A U D SD

8. I think it is perfectly acceptable for cattle and hogs to be raised for human consumption.

SA A U D SD

9. Basically, humans have the right to use animals as we see fit.

SA A U D SD

10. The slaughter of whales and dolphins should be immediately stopped even if it means some people will be put out of work.

SA A U D SD

11. I sometimes get upset when I see wild animals in cages at zoos.

SA A U D SD

12. In general, I think that human economic gain is more important than setting aside more land for wildlife.

SA A U D SD

13. Too much fuss is made over the welfare of animals these days when there are many human problems that need to be solved.

SA A U D SD

14. Breeding animals for their skins is a legitimate use of animals.

SA A U D SD

15. Some aspects of biology can only be learned through dissecting preserved animals such as cats.

SA A U D SD

16. Continued research with animals will be necessary if we are to conquer diseases such as cancer, heart disease and AIDS.

SA   A   U   D   SD

17. It is unethical to breed purebred dogs for pets when millions of dogs are killed in animal shelters each year.

SA   A   U   D   SD

18. The production of inexpensive meat, eggs, and dairy products justifies maintaining animals under crowded living conditions.

SA   A   U   D   SD

19. The use of animals such as rabbits for testing the safety of cosmetics and household products is unnecessary and should be stopped.

SA   A   U   D   SD

20. The use of animals in rodeos and circuses is cruel.

SA   A   U   D   SD