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AN INVESTIGATION OF EMPATHY IN ADULTS AS A FUNCTION OF
VARIABLES IN THREE CLUSTERINGS:
DISPOSITIONAL, SITUATIONAL,
AND BIOPHILIAL

by

Beth Daly

A Dissertation

Submitted to the Faculty of Graduate Studies and Research
through the Faculty of Education and the Joint Ph.D. Program
in Partial Fulfillment of the Requirements for
the degree of Doctor of Philosophy at the
University of Windsor

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Abstract

To determine which variables (Dispositional, Situational, Biophilial) best predict levels of empathy, 448 (M = 144, F = 304) teacher candidates were examined with respect to the Questionnaire Measure of Emotional Empathy (QMEE) (Mehrabian and Epstein, 1972). Variables were assigned to “clusters” that have been linked, either logically or empirically, to empathy, and are potentially important predictors. Dispositional variables (anti- and prosocial behaviour, and personality measures) are reportedly linked to the empathic development of children and young adults, as are Situational variables (parental behaviour during childhood, age, and gender). Biophilial variables related to pets (e.g., history with pets, pet ownership, pet attitudes, and pet preference) are also logically linked to empathy and provide a theoretical framework for situating the determinants of empathy. Multiple regression analyses showed that certain personality traits (SONSO Personality Inventory, Kentle, 1994), physical aggression (The Aggression Questionnaire, Buss & Perry, 1992), certain demographics (e.g., sex, age, parents’ marital status, etc.), and pet-related aspects of biophilia (Pet Attitude Scale, Templer, Salter, Dickey, Baldwin, & Veleber, 1981; Pet Preference Inventory, Daly & Morton, 2003) were predictors of empathy. Psychological influences, particularly sympathy, were quite strong, as was the demographic variable of Sex, indicating higher empathy in females. A fine-grained analysis of empathy based on factor analyses yielded six Aspects of Empathy from the QMEE revealing that individuals may be high in specific types of empathy as a function of different variables. When “Sex” and “Sympathy” were removed from the analyses, it was apparent that certain biophilic variables (e.g., “Would Love a Dog,” “Would Love a Cat”) were more prominent. Variables were also configured in

terms of model-building. The biophilia cluster was divided into two subclusters: Pet-Relations and anthrozoophilia, which was comprised of the two variables Humanizer of Pets, and Lover of Pets. Specific variables from the three new clusters (Dispositional, Situational, Pet-Relations) correlated with anthrozoophilia. Anthrozoophilia was a predictor of empathy. Implications extend to (1) understanding empathy in terms of both innate and environmental determinants, (2) profiling empathic individuals, (3) building a model to predict empathy based on human-animal relationships, (4) developing ways to promote student and teacher empathy and examine this impact in broader educational settings, and (5) exploring anthrozoophilia as a theoretical component of the biophilia hypothesis.

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Dedication

In loving memory of Mary Slater,
without whom I would be a different person today,
and her daughter, Susan Dupuis.

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CHAPTER 1

INTRODUCTION

There is an increasingly important need for the continued aspiration to, and promotion of, empathy in contemporary society. Escalating problems related to manners, bullying, drug use, corporate fraud, political unrest, and terrorism underscore the growing need for tolerance and respect among individuals. Further, technological advances have also expanded small communities to a “global village” and made many of the global issues a North American concern, indeed, even a local concern. While conflict in the Middle East, famine in African nations, and genocide in European countries were once regarded as problems confined to their own countries, they now have a direct impact on North Americans and contribute to an array of social consequences. For instance, the American and Canadian political involvement in overseas countries obviously has a direct impact on economic and social issues at home. Also, an influx of immigrants requires sensitivity to other cultures from within communities and classrooms, even when individuals come from areas that are perceived to be threatening.

An array of problems within schools, ranging from bullying and hazing to random acts of violence, such as the mass shootings in Littleton, Colorado, or the killing of Reena Virk in Canada, have come to characterize the climate in which educators now find themselves. Furthermore, the increase of families in which both parents work, or that are headed by single-parents, makes it incumbent upon educators to promote in children and adolescents the importance of caring for one another and of developing a compassionate nature, which traditionally has been regarded as the role of parents. Further, educators must not only promote empathy in their students, but should also model empathy by

being empathic themselves. Accordingly, many schools have begun implementing value-training programs such as *Character Counts* and *The Roots of Empathy*, in which educators aspire to instill in students the meaning of such core values as trustworthiness, respect, responsibility, fairness, caring and citizenship.

While such pedagogic endeavours have met with success, the development of empathy is clearly influenced by a variety of factors, both throughout childhood as well as later in life. In fact, that “empathy” has often been used interchangeably with compassion, kindness, sympathy, and sentimentality speaks to its vitality as an important, even necessary, quality for all individuals. Each of these descriptors contributes to the picture of empathy as a vital and sustainable quality.

There appear to be two major areas of influence with respect to empathy development: nurture (i.e., external, demographic and environmental variables) and nature (i.e., innate or psychological trait variables). While children certainly become more empathic with developmental age, clear differences exist with respect to biological variables such as sex (i.e., females are typically more empathic than males), and environmental variables such as family dynamics (i.e., parental marital status, number of siblings, etc.). While personality, behaviour, and environment are instrumental in the development of empathy, one area that is not typically viewed as important, or even relevant for the development of empathy is what has been termed biophilia (Wilson, 1984), or at least the aspect of biophilia linked to the human-animal relationship. As may be seen in the wealth of literature related to human-animal relationships, such relationships reportedly have a dramatic impact on empathy development. These pet-related variables are related to both nature and nurture, as they are associated with both

demographic and psychological areas. Demographically, for instance, pet ownership, number of siblings, age of owner, and type of pet, have been linked to empathy.

Psychologically, factors such as attachment to pets and attitude toward animals, as well as personality and sex, have been linked to empathy. Further, because cruelty toward animals is consistently found to be a precursor to violence toward other persons, it logically follows that kindness towards animals is, at least to some degree, a predictor of empathy throughout one's life. The notion of biophilia, that is, an innate tendency to attend to animals and nature for adaptive purposes (Wilson, 1984), may serve as a valid integrating perspective.

In addition, a relationship between positive attitudes toward pets and high empathy, as has been demonstrated in much of the literature, could have significant implications for educators in designing more effective and meaningful pedagogic strategies for developing empathy. For example, animal life forms in the classroom, which requires the care and nurture of these animals, is not just an element of a science curriculum unit on animal behaviour. It quite likely fosters empathy development. Other techniques, such as encouraging activities such as an animal-visitation program, or volunteer work in shelters, can also facilitate empathy development. Nevertheless, while positive benefits are consistently reported with respect to human-animal contact, there are conflicting reports regarding the nature of the positive influence of pet ownership on empathic development that invite further exploration. For instance, the majority of researchers in the area of the human-animal bond report that pet relationships generally yield positive benefits for both children and adults. There is overwhelming support, however, for research that supports that animals provide emotional support and

companionship for children in disadvantaged environments (Gonski, 1985; Mallon, 1994) or with disabilities (Limond, Bradshaw, & Cormac, 1997; Redefer & Goodman, 1989), serve as a transitional object for adolescents (Triebenbacher, 1998), and as a means of encouraging social acknowledgement for children in wheelchairs (Mader, Hart, & Bergin, 1989). For adults, pets have been shown to reduce stress (Allen, Blascovich, Tomaka, & Kelsey, 1991; Beck & Katcher, 1996; Baun, Oetting, & Bergstrom, 1991) and blood pressure (Allen, 2001; Allen, Gross, & Izzo, 1997; Beck & Katcher, 1996; Katcher, Friedmann, Goodman & Goodman, L., 1983), improve the survival rates following heart attacks (Friedmann, Katcher, Lynch, & Thomas, 1982; Friedmann & Thomas, 1995), provide therapeutic benefits for infertile couples (Blenner, 1991), and serve as a means of affection and companionship for seniors (Crowley-Robinson, Fenwick, & Blackshaw, 1996; Francis, 1991; Garrity, Stallones, Marx, & Johnson, 1989) and single persons (Zasloff & Kidd, 1994). Nevertheless, findings remain inconsistent in the area of pet-relationships and empathy. Moreover, while several researchers have pointed to studies that yield a correlation between pets and empathic development in individuals, others have found inconclusive results that lead to speculation with respect to more specific factors (Daly & Morton, 2003; Poresky & Hendrix, 1990). It is likely, then, that there are other factors that contribute to empathic development in individuals, perhaps in support of relationships with pets. Accordingly, an investigation of these variables is warranted.

CHAPTER II

REVIEW OF THE LITERATURE

The Significance of Empathy

A number of researchers have characterized empathy as instrumental to the development and enhancement of prosocial behaviour (Eisenberg et al., 2002; Ellis, 1982; Zahn-Waxler & Robinson, 1992). On one hand, empathy reportedly contributes to the reduction of aggressive behaviour (Davis, 1994; Feshbach & Feshbach, 1969; Mehrebian & Epstein, 1972). Yet, Eisenberg and Fabes (1990) reported that investigations of the relationship between empathy and prosocial behaviour might be limited because researchers have not identified specific behaviours and responses. However, when such limitations are controlled for, there appears to be a consistent association between empathy and prosocial behaviour in children. Thus, there might be implications for empathy as a self-regulator for one's own behaviour (Braaten & Rosen, 2000).

Another value that empathy has for an individual, and arguably for a society as a whole, is its relationship to altruistic behaviour, simply defined as one's motivation to increase another person's welfare (Batson, Ahmad, & Stocks, 2004). Hoffman (1981) speculated that empathy mediates altruism and argued for evidence pointing to empathic distress as a precursor to helping behaviour. As related to prosocial behaviour, empathy is also vital to healthy growth and development (Zahn-Waxler & Radke-Yarrow, 1990). To demonstrate concern for others is a sign of positive mental health, while mental and emotional problems are often linked to a disruption in the empathic processes. For example, schizophrenia, personality disorders, antisocial behaviour, and narcissism are

often marked by diminished empathy (Zahn-Waxler & Radke-Yarrow, 1990). It has also been speculated that people low in empathy are at risk for such externalizing behaviours as threatening, attacking, and fighting with others (Zhou et al., 2002).

The link between empathy and pro- and anti-social behaviour is an important area in empathy research. In a longitudinal study of prosocial development in young adults (Eisenberg et al., 2002), researchers investigated factors in childhood that may have contributed to prosocial behaviour later in life. The instruments included self-reports, mothers' reports, friends' reports, and observed prosocial behaviour in preschool. The subjects' self-reported empathy was also linked to prosocial behaviour. Dispositions found in early childhood were generally stable into adulthood (N=32). Further, a recent exploration pointed to evidence that high empathy leads to increased helping behaviour, reduced aggression, more cooperation in conflict situations, and improved attitude toward marginalized groups (Batson et al., 2004).

There also exists considerable evidence for empathy as an antecedent to altruism. Batson and colleagues (1988) advanced that, according to the empathy-altruism hypothesis, the prosocial motivation that one feels toward another person is solely intended to benefit the other person, rather than for one's own self-gratification. This hypothesis contrasts the general psychological speculation that prosocial behaviour is ultimately egoistic. In order to test egoistic explanations alternative to the empathy-altruism hypothesis (Batson et al., 1988), five studies were conducted to test both the empathy-specific reward hypothesis and the empathy-specific punishment hypothesis. The former predicts that when individuals feel empathy, social- and self-rewards are motivational in inducing helping behaviour. Similarly, the empathy-specific punishment

hypothesis speculates that individuals are motivated toward helping behaviour in order to avoid negative consequences that result from not helping.

In order to test the prediction of the empathy-specific reward hypothesis, high-empathy subjects should report a more positive mood when they cause relief to a victim than when the victim experiences relief from another source. The first of the five studies created a situation in which this was tested, and it was found that, contrary to the prediction, high-empathy individuals felt no more relief when they were the agent of a victim's relief than when they were not. Thus, the empathy-altruism hypothesis was the prevailing finding. In the second and third studies, there was no support for the empathy-specific punishment hypothesis. Rather, subjects exhibited helping behaviours that were consistent with the empathy-altruism hypothesis. Similarly, the implications for studies four and five showed virtually no support for the empathy-specific punishment hypothesis but significant support for the empathy-altruism hypothesis. In other words, the findings that emerged as a result of the five studies were remarkably consistent. The researchers found no support in any of the studies for either the empathy-specific punishment hypothesis, or the empathy-specific reward hypothesis. Although it was cautioned that more evidence is needed to directly support the empathy-altruism hypothesis, they advanced that empathy does appear to evoke altruistic behaviours.

While conventional wisdom may lead to the presumption that altruism is all good, Batson et al. (2004) pointed to both benefits and liabilities related to the empathy-altruism hypothesis. They refer, for instance, to the "empathy avoidance" which one might enact when the potential to experience empathy causes one to ignore a person in distress. Similarly, "compassion fatigue" may result, especially among those in the

helping professions, due to the overwhelming amount of assistance required by individuals. Further, empathy-induced altruism may challenge moral action if one's desire to help an individual trumps the moral principle of acting fairly for the benefit of a group.

The Definition of Empathy

Historically, *einfuhlung* (empathy) is rooted in late-nineteenth century German aesthetics (Wispe, 1987), and literally translates to “feeling into” (Karem, Fishman, & Josselson, 2001). Lipps (1905, German translation, in Wispe, 1987) wrote that an object of beauty provides aesthetic satisfaction, and while this satisfaction consists of the object, it does not reside in the object, but in the observer. The distinction between the objects and one's self is key to the definition of *einfuhlung*. Since then, empathy has been given different names and examined in different contexts. Titchener (1909) coined the term “empathy” in early twentieth-century American experimental psychology, although its original meaning remains vague. Accordingly, Wispe (1987) pointed out that every decade appears to see new psychological concepts that make previous concepts untenable. At the beginning of the twentieth century, the concept of empathy was ubiquitous (Wispe, 1987). Prandtl (1910) posited that individuals can understand both their self and others either by “empirical empathy” (association) or by empathy through feeling. Similar to Lipps' definition is the experience that what is occurring in the perceiver is also occurring in the object. Thus, *einfuhlung* essentially explained how one grasps the meaning of both aesthetic objects and others' consciousness. Essentially, what is now “vicariousness” was inherent to the initial definition of empathy.

Empathy has had a sporadic history throughout the psychological and educational literature for a number of reasons, due to, quite simply, major problems in empathy research (Duan & Hill, 1996). Among the major obstacles are vague and varying definitions, controversy over whether empathy is comprised of cognitive or affective elements, and difficulties in establishing valid measurement tools, perhaps related to the inconclusive definitions. It has been suggested that empathy is a “response,” as opposed to the motivational “state” of altruism, to which empathy has been regarded as a precursor (Batson et al., 2004). However, empathy “is, and always has been, a broad, somewhat slippery concept” (Eisenberg & Strayer, 1987), and defining it is inconclusive by nature (Clark, 1980). Nevertheless, Wispe (1987) pointed out that there has been a “remarkable consistency of usage and meaning” with respect to its definition. Although one cannot fully explain empathy, just as memory or imagination cannot be fully explained, the parameters of empathy can be investigated. It has a fluid definition that does not lend itself well to significant and valid research (Clark, 1980; Zahn-Waxler & Radke-Yarrow, 1990), and has perhaps been partly to blame for hindering investigations of empathy throughout the last decade (Moore, 1990). Yet, there has been a consistent ongoing attempt to define it.

The crux of problem in defining empathy, at least in the early literature, appears to have been linked with the need to identify it as either cognitive or affective (Duan & Hill, 1996; Feshbach, 1975; etc.) In fact, Karem et al. (2001) even questioned whether or not defining empathy was necessary. Nevertheless, significant researchers in the field have acknowledged that empathy is both cognitive and affective and acknowledged the interwoven relationship of both as essential components of empathy (Baron-Cohen &

Wheelright, 2004; Davis et al., 1999; Feshbach & Roe, 1968; Hoffman, 1984; Mehrabian & Epstein, 1972; Moore, 1990; Zahn-Waxler & Radke-Yarrow, 1990). Simply described, the cognitive component of empathy is one's ability to recognize, know, and understand what another person is feeling, though not necessarily share in the experiencing of the feeling. The affective component is the emotional component of empathy. Thus, this component enacts a vicarious emotional response with which the empathizer matches the emotion of the other. Because the two components are dependent on one another, empathy should therefore be conceptualized as a cognitive product mediated by affective factors, or an affective response mediated by cognitive processes. Similarly, their mutual relationship leads to the ability to understand, imagine, and share another person's emotional state (Zahn-Waxler et al., 1992) and enacts a vicarious response (Feshbach & Roe, 1968; Moore, 1990). Thus, for the purposes of this research, empathy is defined as a combination of cognitive and affective components of one's ability to recognize and understand another person's experience, and to affectively and vicariously share in the feeling.

Determinants of Empathy

There are several bodies of literature suggesting that empathy emerges from different sources (i.e., biological, environmental, etc.). Interestingly, while the different explanations do not necessarily contradict one another, and can perhaps even be regarded as complementary, they do compete with one another in terms of which is the stronger influence: nature (internal sources) or nurture (external sources). A number of theorists have advanced that empathy is biological, and emerges as a result of internal factors. This theory is not limited to the notion that empathy is innate, since psychological

development is generally believed to enhance inborn empathy. On the other hand, some theorists have advanced that empathy is affected and enhanced by external factors, as opposed to biological factors, and that one's surroundings strongly determine one's level of empathy. Finally, there is a less explored but growing body of literature that advances the notion that empathy has both internal and external sources, and is enhanced or diminished by attitudes or feelings. Of particular interest in this dissertation are the attitudes and feelings with respect to animals and human-animal relationships since the biophilia hypothesis (Wilson, 1984) may serve as an integrative explanation for empathy.

Biological Foundations of Empathy.

There is a range of evidence that empathy, at least in its initial stages, is biologically based and thus innate in humans. Biologically-based theories are rooted in the concept that empathy is linked to a survival instinct: individuals must be able to identify others' emotions, comprehend their intentions and motives, and make a positive investment in the interpersonal relationship with the other (Zahn-Waxler et al., 1992).

Hoffman (1981) also speculated that empathy, at least in its most primitive form, is innate, as evidenced in newborn's reflexive crying. Because survival is an immediate concern at birth, there must exist inherent mechanisms to ensure survival, by attracting the immediate attention of one another (Plutchik, 1987). In this rudimentary form there would be no affective or cognitive elements, just the hard-wiring that would provide an infrastructure for the later development of empathy.

In examining the way in which empathy is related to biological and evolutionary issues, Plutchik (1987) explored whether animals exhibit behaviour patterns homologous to empathy in humans, and the survival instinct that is then served by this empathy. That

empathy is a “widespread phenomenon” in animals is suggested by a large number of different behaviours. In the animal kingdom, behaviours include the tendency toward schooling, flocking, mobbing, and herding in birds, fish, and mammals. Shermer (2004) described a number of characteristics that appear to be shared by humans and other mammals, including altruism, mutual aid, and empathy. This may be, as Plutchik (1987) points out, a component of affective signaling, based on innate, genetically determined, schema. According to Plutchik, the essence of empathic responding is the communication of an emotional state from one organism to another. In fact, it was suggested that one aspect of empathy is inherent in the way in which individuals bond to one another, particularly with respect to mothers and infants. It is a process in which two or more individuals share significant emotional experiences, either positive or negative experiences.

Plutchik (1987) also suggested that empathy is advanced through display signals, related to specific types of interaction. These are related to motivationally important events, including courtship and mating displays, distress displays, and feeding displays. The common element in all these is the likelihood of inducing similar feelings between the individuals sending and receiving the messages. Plutchik’s hypothesis is consistent with Hoffman’s (1981) assertion that empathic distress should precede, and contribute to, helping behaviours, and that its intensity should be diminished following the helping behaviour. The researcher pointed to considerable evidence that the intensity of physiological arousal is positively correlated with the intensity of subsequent helping behaviours. For instance, as the intensity of victim pain cues increase, so does an observer’s physiological arousal. Other researchers have reported similar findings for the

immediacy-nonaggression hypothesis. The findings of two seminal research endeavors (Mehrabian & Epstein, 1972; Milgram, 1965) indicated that those who were high in empathy were less aggressive when a victim's pain was immediate.

Studies of empathic development in twins have also shown evidence for a biological foundation for empathy as genetic and heritable. In a study of the prosocial patterns of twin children (Zahn-Waxler et al., 1992), these patterns were examined for how they mediate or disrupt orientations toward empathy in both monozygotic (MZ) and dizygotic (DZ) twins. Sex differences were evident, and expected, with females demonstrating higher empathy than males. With respect to prosocial behaviour, there was evidence of such, though not as evident as is typically found in singletons. Further, correlations were found at 14 months for prosocial acts (.43) and empathic concern (.29) with monozygotic twins, but not for dizygotic twins. At 20 months, correlations were still present for empathic concern (.30) in monozygotic twins. Thus, there was modest evidence for heritability of empathy and, interestingly, the influence of a shared environment for twins was also a factor. It was advised that these results be interpreted with caution, as they were based on mothers' reports, many of whom may have been reluctant to report that one twin exhibited more empathic behaviours than the other. However, if this were the case, one might expect similar findings for both the MZ and the DZ groups. Nevertheless, it was reported that both environmental and genetic factors influence empathy in twins, and that parents' influence on prosocial behaviour during development may play an important role.

While there exists substantial evidence for a biological basis to empathic development, the majority of researchers who maintain that empathy is innate also

suggest that empathy is increased as a result of development (Eisler & Levine, 2002; Hoffman, 1981; Plutchik, 1987; Thompson, 1987), which Hoffman (1981) likened to “helping to throw light on a central issue in the sociobiological literature” (p. 121). Similarly, Plutchik (1987) suggested that “as with all behaviors that have genetic components, there is reason to believe that experience and learning may also influence the intensity and frequency of empathic behaviors.” Innate empathy, for example, lacks the cognitive complexities necessary in order for young children to engage in appropriate helping behaviours. As a child’s cognitive capacities develop, these responses also increase. Thompson (1987) advanced a similar notion: when children observe clear signals, it is because these symbols resonate with the observer’s own experiences. However, if clues are not readily available, if they are outside the child’s experience, they must be inferred, which requires cognitive and role-taking abilities that are typically more advanced and sophisticated. Accordingly, evidence of empathy may depend on the kind of information that is available. Thus, cognitive elements are necessary to understand this. Ungerer et al. (1990) also pointed to the “considerable controversy” surrounding the nature of empathic response in infants and toddlers. For instance, young children’s responses to others obviously lack cognitive capacities. As such, rather than demonstrating empathy, they might only be displaying emotional contagion (Ungerer et al., 1990). However, this is not inconsistent with the notion that empathy increases with natural development, and the researchers indicated evidence of empathic responses appear to evolve across developmental periods.

In addition to the natural developmental course, environment also plays a key role in the increase of empathy. In an introduction to a discussion of research on brain

development and caring behavior, Levine (2002) speculated that biological aspects of empathy are mediated by social contexts. In a theoretical framework outlining the conflict between nurture and nature, Eisler and Levine (2002) advanced that while a solely genetic explanation for caring behaviours is inadequate, the evolutionary nature of such behaviours in all mammals is essential for survival. In fact, the Darwinian paradigm of natural selection supports the notion that humans, as a group, survived because their capacity to care and empathize was desirable for evolution. Evolution has essentially provided the opportunity for the increased thinking capacity required to recognize similarities between one's self and others, leading to empathic behaviour. This is consistent with Shermer's (2004) assertion that there does exist an evolutionary basis for caring behaviour in animals, which he calls "moral sentiments." While one might expect that a natural competitiveness would abound among animals, Shermer points to the cooperative behaviour of vampire bats and primates that strongly suggest an evolutionary model for moral behaviour in humans. Hoffman (1981) also pointed to competitive behaviours as intending to advance a group, rather than an individual, as a means of explaining cooperation and group selection. Accordingly, Eisler and Levine (2002) advanced that *gene expression* is the process of individuals' genes either expressing or inhibiting the capacity to demonstrate caring behaviours as a result of the interplay between environmental influences and personality traits. Central tendencies mediate the behaviours. Essentially, biological, psychological, and environmental factors influence one another in the mediation of empathy. Clearly, then, a growing body of research addressing the conflict between nature versus nurture points to evidence of biology and heredity playing a key role in empathic development, but as mediated by external,

experiential factors (Davis, 1994; Hoffman, 1981; Levine, 2002; Plutchik, 1987; Thompson, 1987).

It is apt to include at least a brief discussion of the contributions of Jean Piaget. Gladstein (1984) reported that although Piaget did not specifically write about empathy, he provided much of the major grounding for the psychological views on the roots of empathy in children. For instance, a child's ability to decenter (Ginsburg & Opper, 1969), to eventually understand the separateness of one's self from other objects in the environment, surely is necessary as a precursor to empathic development. Further, although the notion exists that Piaget has shifted the interests of developmental psychology only toward cognitive development, it has been speculated that his theory of emotional development contributes to a theory of the relationship between emotional and cognitive development (Cicchetti & Hesse, 1993). In fact, Cicchetti and Hesse (1993) point to Piaget as the only researcher who specified the relationship between cognition, emotion, and morality. This resonates with other theorists' speculations (Hoffman, 1981; Thompson, 1987) that empathy develops along a complex continuum of development. Nevertheless, Strayer (1987) cautioned that Piagetian theory is not appropriate for making links to empathy development because of Piaget's belief that affect and cognition are not necessarily related.

Dispositional Determinants of Empathy

There are a number of psychological factors which contribute to the development of empathy. For instance, Davis (1994) argued that temperament, which emerges from biological makeup, is a mediator of empathic response in individuals. Other researchers also support the claim that certain personality traits are linked to empathy, particularly

aggressive and antisocial behaviours (Sandoval, Hancock, Poythress, Edense, & Lilienfeld, 2000). In an early study, Feshbach and Feshbach (1969) questioned whether high empathy could be predicted in individuals who exhibited less aggression when compared to individuals who were high in aggression. This speculation was based on observations that distress responses would be elicited in an observer of consequences of an aggressive act, regardless of the perpetrator of the act. Two age groups were investigated, comprised of 48 four- and five-year old nursery school students, and 40 six- and seven-year old students. Males and females were equally distributed within the two groups. The children observed pictures and heard stories related to a series of affective situations reflecting happiness, sadness, fear, and anger. Empathy was determined by how the children expressed their feelings, as aligned with pictures they observed and stories that they heard. Aggression was rated by either one or two teachers, on a nine-item aggression rating scale. While the difference was insignificant for all girls, high empathy boys were somewhat surprisingly rated as significantly more aggressive than those with low empathy. However, 6- and 7-year old boys with high empathy were significantly less aggressive than the low empathy category.

While the findings were inconclusive, there was partial support for the predicted relationship between empathy and aggression. However, it is important to note that there were several limitations to the study. First, because the subjects were all students in a laboratory school within a university, it was a fairly homogeneous population of predominantly middle-class Caucasians, and two-thirds of parents were in either professional or managerial occupations. It is possible that parental influences might have contributed to certain behaviours. Secondly, the situations that the children observed in

the slide sequence series involved a scenario in which a dog has run away and is described as perhaps being “gone and lost forever.” It is likely that children who own pets, or who are attached to animals, would respond more strongly to this particular situation, yet individual experiences were not controlled for in this study. Additional demographic information, and a more diverse experimental population, might have yielded very different, and perhaps more conclusive, results.

In a study of the relationship between the aspects of psychopathic personalities and empathy, Sandoval et al. (2000), investigated how the Psychopathic Personality Inventory (PPI) (Lilienfeld, 1990) correlated with four theoretical aspects of psychopathy. The PPI was constructed, in part, to eliminate limitations found in other self-report measures for psychopaths that allow the manipulation of the instrument in order for the subject to present a favourable self-presentation. The PPI omitted items that assessed antisocial and criminal behaviours, focusing on certain traits of psychopathy. The four theoretical aspects measured were empathy, aggression, work ethic, and borderline personality disorder. In addition to expecting a negative relationship between psychopathy and empathy, a negative relationship was also expected for the two PPI subscales of (1) Machiavellian Egocentricity and (2) Coldheartedness, and empathy.

In addition to the PPI, the measures used included the Questionnaire Measure of Emotional Empathy (Mehrabian & Epstein, 1972), the Aggression Questionnaire (Buss & Perry, 1992), the Protestant Ethic Scale (Mirels & Garrett, 1971), and the Self-Report for Borderline Personality (Oldham et al., 1985). One-hundred pretrial inmates (M = 96, F = 4) from a Florida county prison participated in the research. They ranged in age from 18 to 51 years (mean = 32.5) and had an average of 11.4 years of schooling. Fifty-two

percent were White and 44% were African-American. Approximately 50% had already served time in prison.

As expected, there was a significant negative relationship ($r = -.45$) between the PPI's total score and the QMEE. There were also negative correlations between the QMEE and the PPI subscales of Machiavellian Egocentricity ($r = -.40$) and Coldheartedness ($r = -.52$). It was reported that there are personality features typically associated with psychopaths which explained the negative correlations between empathy and these two PPI subscales. For instance, callousness and manipulation in social relationships are common, and these subscales measure ruthless and narcissistic attitudes (Machiavellian Egocentricity) and guiltlessness and nonsentimentality (Coldheartedness). However, while the researchers pointed out that the findings supported the construct validity of the PPI, they cautioned that because all of the data were based on self-report, they could not exclude the possibility that some of the findings were attributed to methodological issues.

In an investigation of the relationship between self-report empathy and self-report aggression (Richardson, Hammock, Smith, Gardner, & Signo, 1994), empathy was highly correlated with non-aggressive responses. In a large-group testing environment, 95 male and 94 female university students completed several questionnaires related to empathy and aggression. The Rahim (1983) Organizational Conflict Inventory referred to the behaviour of a friend or a sibling and produced a problem-solving score. The Interpersonal Reactivity Index (Davis, 1983) assessed the cognitive and affective components of empathy as perspective-taking and empathic concern. Dispositional hostility and aggression were assessed with the Buss-Durkee (1957) Hostility Inventory,

and the Steinmetz (1977) Family Problem Solving Questionnaire assessed the type of responses used when in conflict with siblings. This particular instrument was modified and yielded two subscales. The Discussion subscale referred to calm discussion and arguing without yelling. The Aggression subscale included behaviours such as yelling, throwing items, and hitting. As expected, perspective-taking was positively related to discussion, problem-solving, and obliging with sibling, as well as problem-solving with a friend. Further, empathic concern was negatively related to aggressive tendencies. Based on the results of this study, it is interesting to note that cognition and affect played independent but complementary roles in the mediation of empathy. For instance, cognitive empathy was only related to aggression in moderate threat, as opposed to low- and high-threat, conditions. Although caring behaviours may inhibit aggression, a heightened cognitive response may further reduce aggressive behaviour.

Miller & Eisenberg (1988) have also claimed a consistent negative relationship between empathy and aggression. It was posited that if empathy inhibits negative social behaviours, including aggression, then individuals with lower empathy levels may exhibit delays in sociomoral development, including increased antisocial behaviours. This likely leads to reduced empathic expressiveness toward others. Among the theoretical considerations, it was pointed out that the presence of cues that indicate pain are often associated with individuals who have a history of aggressive behaviour and who may not be aware of, or respond appropriately to, other's pain cues. Abusive parents, for instance, who are less likely to respond to their children's pain cues might affect a similar pattern in children, who in turn may have difficulty responding to pain cues in others. Because children do not have their needs and feelings appropriately acknowledged and attended

to, they are denied the experience of empathic responding and may be unlikely to demonstrate this toward others.

The researchers (Miller & Eisenberg, 1988) undertook a comprehensive—if not, exhaustive—meta-analysis of research and literature related to empathy and aggression in a variety of age groups. It included published studies, unpublished manuscripts, dissertations, reviews, and so on. To ensure inclusion of all relevant materials, and to control for the omission of nonsignificant findings, additional searches were initiated in order to solicit from researchers any in-progress or unpublished works. The studies were then grouped and examined according to three areas: empathy measures related to empathy-aggression, findings related to externalizing behaviours, and studies involving victims or perpetrators of abuse.

They sought to examine whether aggressive individuals exhibited lower empathy than nonaggressive persons, and whether other negative, antisocial, and psychopathologic behaviours were associated with empathic responsiveness. Three hypotheses were put forth. First, that because individuals with dispositional empathy should empathize in any situation, they would exhibit lower levels of aggression. Secondly, negative externalizing behaviours similar to aggression would also be negatively related to empathy. Finally, victims of abuse, because of their negative socializing experiences, would exhibit lower empathy than those without a history of abuse.

It was concluded by the authors that empathy was negatively related to aggression, externalizing and antisocial behaviours, and enactment and receipt of physical abuse. However, estimates for these associations of the common correlation were only low to moderate (-0.6 to -.46). Furthermore, the significance of some of these

estimates was influenced by age, mode of assessing empathy, or method of assessing negative behaviours. Nonetheless, reasons for this moderate correlation were considered. For instance, there was some variance that seemed related to different instruments used to assess empathy. A significant negative relationship occurred when empathy was assessed with questionnaires, but not with measures of facial affect, experimental induction, and picture/story methods, which are typically used on young children. Further, while age appeared to influence results related to picture/story measures, the results were actually significant when preschoolers were excluded from the analysis. It was noted that age as a moderating variable between empathy and aggression is an important issue for further research.

Again, there was a significant negative correlation between empathy and externalizing/antisocial negative behaviours, but not when picture/story instruments were included. It was suggested, however, that these results underestimate this association for a number of reasons. First, the measures often solicited empathic responses to both positive and negative situations. If reactions to negative affective states were assessed separately from reactions to positive affective states, there might be a stronger relationship. Secondly, it is possible that some criterion measures of aggression may actually be influenced by empathic responses of subjects. Finally, the authors thought it likely that the inhibition of negative reactions was influenced by factors other than empathic responding. They refer to such things as sex differences, aggressive nature, and inappropriate interpretations of another person's behaviour.

Ellis (1982) examined the relationship between empathy and aggressive and antisocial behaviour in juvenile delinquents. The experimental group was comprised of

331 incarcerated male delinquents, aged 12 to 18, and a control group of 64 nondelinquent (no history of arrest) high school males. The experimental group was further divided into three subgroups of delinquency and three types of aggression. The subgroups were psychopathic delinquent, neurotic delinquent, and subcultural delinquent. Individuals assigned to the psychopathic group were characterized as manipulative, amoral, guiltless, self-centered, and held no loyalties. The neurotic delinquent shared some of the same characteristics, but experienced guilt and tension over inappropriate behaviours. The subcultural delinquent had a tendency to reflect the values and behaviour of a disadvantaged subculture, but exhibited loyalty and adjustment within a peer group and was generally self-satisfied. The three types of aggression ascribed to the delinquents were nonaggressive (81 subjects), aggressive-against-person (159 subjects), and aggressive-against-property (91 subjects). The individuals were assigned to the appropriate group based on their recorded history of criminal behaviour.

An analysis of variance revealed that the subculture delinquent group was significantly more empathic than the psychopathic delinquents, who were in turn more empathic than the neurotic group. Though higher, the difference between empathy scores of nondelinquents and the subcultural delinquents was not significant. As expected, the delinquents scored significantly lower in empathy than did the nondelinquent group. Further, nonaggressive delinquents were significantly more empathic than both the aggressive-against-person and aggressive-against-property groups. There was also a significant relationship between age and empathy for the control group and the subcultural delinquents, including the nonaggressive delinquents, but not for the two aggressive groups. Thus, support was found for a delay or arrest in empathy development

among aggressive delinquents in both subgroups. Further, the delinquents who were somewhat adjusted within their own subculture demonstrated higher empathy than those who were more maladjusted, suggesting that empathy is indeed an important factor for prosocial development. Empathy was therefore demonstrated to be a contributing variable for the inhibition of aggression.

Similarly, Cohen and Strayer (1996) conducted an investigation of cognitive and affective components of empathy in both conduct-disordered youths and a comparison group. A total of 62 adolescents participated in the study. The conduct-disorder (CD) group was comprised of 30 volunteers (M=14, F=16) from a residential treatment facility with a mean age of 14.9 years. The youths had been assessed by a mental health professional for externalizing-type behaviours, and all were reportedly of average or above-average intelligence. The comparison group (NC) was comprised of 32 volunteers (M=15 boys, F=17) from a local high school with a mean age of 15.6 years and reportedly had average intelligence scores

Several instruments were used to measure empathy, including the Bryant (1982) Empathy Index, which is based on the Mehrabian and Epstein (1972) Questionnaire Measure of Emotional Empathy. However, cognitive and affective aspects were examined separately using the Davis (1983) Empathic Concern Scale, which has been also called, elsewhere in this review, the Interpersonal Reactivity Index. As expected, overall empathy was significantly lower for the CD group, indicating that both affective and cognitive aspects contribute to poorer performance. The low affective components were regarded as particularly important because this aspect differentiates empathy from other emotional constructs. It was also cautioned that low empathy should not be equated

with low emotionality, however, and that CD youth actually tended to report higher levels of personal distress than non-CD individuals. Finally, girls were reportedly more empathic than boys, although gender differences were not evident on the cognitive scales. In assessing the overall findings, the researchers called for further investigation of family and socialization variables in order to better understand the developmental factors that may have also contributed to these reported differences between the CD and the NC groups.

Schonert-Reichl (1993) found marked differences between adolescent males with behavioural disorders and those without, in an investigation of empathy and social relationships. Several variables related to social competence were examined for their correlation with empathy. For the study, 39 adolescent males with behavioural disorders and 39 of their peers without such disorders were matched. The mean age of the subjects was 17.5 years. The variables that were measured were participation in extracurricular activities, amount of peer contact, number of close friends, and the quality of relationships with peers and family members

There were several major findings with respect to group differences. First of all, male adolescents with behavioural disorders were less empathic, engaged in few extracurricular activities, had less contact with friends, and enjoyed lower quality relationships than adolescents without behavioural disorders. Secondly, higher empathy was associated with improved relationships in adolescents without behaviour disorders. Interestingly, there were no differences reported in the number of close friends between individuals with and those without behavioural disorders, and empathy continued to predict the quality of relationships even after the effects of age and SES were controlled

for in the adolescents exhibiting behavioural disorders. This important finding is consistent with previous studies indicating that developmental changes in empathy correlate with age (Ellis, 1982; Feshbach & Feshbach, 1969).

Burke (2001) investigated empathy levels among adolescent sex offenders as compared to nonoffenders. Forty-six males, aged 13 to 17, were chosen from an outpatient sex offender treatment program. All had been charged at least once for first- or second-degree sexual assault, and a condition of participation was that subjects acknowledge their commitment of the offense. The control group was comprised of 23 males, aged 15-18, randomly chosen from a public high school within the same community as the offender program. The 28-item Interpersonal Reactivity Index (Davis, 1983) assessed empathy using four subscales: Perspective Taking, the cognitive aspect of empathy; Empathic Concern, the affective aspect of empathy; Fantasy, the ability to identify with fictitious characters; and Personal Distress, the degree of anxiety or discomfort associated with viewing another's anguish. The subjects used a 5-point Likert (1932) scale to record how accurately their feelings were reflected for each question.

It was found that the sexual offenders scored significantly lower, $t(44)=-2.37, p < .02$, on the empathy measure than did the control group. Further, the experimental group exhibited lower empathy on the Perspective Taking, $t(44)=-2.85, p < .009$, and Empathic Concern, $t(44)=2.29, p < .03$, subscales. While no significant differences were found on the Fantasy and Personal Distress subscales, several limitations to the study should be noted. While the results support a negative association between sexual offending and empathy levels, the behaviour of sexual offense was not separated from other forms of aggression. The researchers also pointed out that this was a relatively small sample size,

and that the one-year mean age difference between the experimental and control groups may be problematic due to the developmental growth during adolescent years. Further, establishing profiles of typical sex offenders is elusive, as is the efficacy of promoting victim empathy in these offenders. As such, it was suggested that future researchers examine factors associated with developmental failures in empathy, and continue advancing studies in order to establish the extent to which offenders differ from nonoffenders.

Similarly, Kaplan and Arbuthnot (1985) investigated whether deficiencies in affective empathy and cognitive role-taking contributed to delinquent behaviour in male and female adolescents. The subjects were administered a structured self-report affective empathy questionnaire, an unstructured affective empathy task, and a role-taking measure. There were no significant differences in role-taking, but there was a significant main effect for delinquency on the affective empathy measure, with the nondelinquents displaying higher empathy. The researchers suggested that the unstructured empathy task, on which respondents must generate and verbalize empathic responses, may present more difficulties for delinquents than nondelinquents. Further, delinquent males scored significantly lower than delinquent females on the unstructured measure of empathy, but there were no significant sex differences in the nondelinquent sample for either empathy measures, or for the delinquent group on the structured empathy measure. In concluding, they questioned whether poor empathy skills contribute to delinquency, or whether becoming delinquent leads to a lack of empathy in social interaction.

Other areas have also been explored that support a negative relationship between empathy and prosocial behaviour. For instance, though not necessarily related to

antisocial behaviour, empathic differences have also been reported in boys with attention deficit-hyperactivity disorder (ADHD) compared with those not diagnosed with ADHD (Braaten & Rosen, 2000). The general findings of the study indicated that the boys who were diagnosed with ADHD demonstrated lower empathy on an empathic reasoning task than did a control group. They also demonstrated more sadness, anger, and guilt than did the control group. Most important, according to the researchers, was that children with ADHD were not as likely as control subjects to match their emotions with those of the children in stories they heard, which were intended to elicit negative emotions. However, there were no significant differences between the groups with respect to those stories intended to elicit positive emotions, although there were differences in the way the two groups of individuals interpreted the positive emotions. The authors consequently suggested that positive emotions might be easier to match than negative emotions. Overall, it was concluded that children with ADHD exhibit less emotional control and empathy only in relation to negative emotions, and that they may indeed be capable of self-regulating their positive emotions.

Depression has also been shown to be linked with empathy, although positively. In a study of women who worked in the helping professions (Gawronski & Privette, 1997), the two independent variables of empathy and life events were examined for their relationship with the dependent variable of depression. It was explained that only women were recruited for the study for the following three reasons: women typically exhibit higher empathy than do men, they are more likely to become depressed as a consequence of life events, and they report higher depression scores than men. The age group was chosen due to the frequency of stressful life events being highest with the 20- to 55-year

age interval, and individuals involved in helping professions were chosen because of the likely differences related to empathy and career choices.

The 53 females were also homogeneous with respect to age and profession. All volunteer subjects worked, or planned to work, in the helping professions, ranged from 21 to 52 years in age, and were either enrolled in a psychology or social work graduate program, or worked as professionals (i.e., nurse, counselor, social worker) in a community care center. Empathy was measured using the Mehrabian and Epstein (1972) Questionnaire Measure of Emotional Empathy (Mehrabian & Epstein, 1972). Life events were measured using Paykel's Scale for Life Events (Paykel, Prusoff, & Uhlenhuth, 1971), which was comprised of a list of events ranging from trivial events to highly distressing and very catastrophic. The Self-Rating Depression Scale (Zung & Durham, 1965) was adapted to measure depression, and a qualitative component which was also employed in which each individual described her own symptoms.

Significant and modest positive correlations were found between empathy and depression for the whole sample, whereas a moderately strong correlation was discovered for the group who had experienced the most severe life events. It was suggested that a larger sample and different population might yield clearer results, as one of the limitations of the study appears to be the sample group. For instance, although individuals who have experienced severe life events were higher in empathy than the entire group, there was still a modest correlation between the entire sample and empathy. Because all individuals worked in, or planned to work in, the helping professions, it is possible that the positive correlations found in the study result from the predispositions of

individuals who choose this type of career path. In other words, there may be a demographic factor at play that warrants consideration when interpreting the results.

Situational Determinants of Empathy

While there is strong evidence for biological and psychological influences on empathic development, there is also support for environmental and demographic factors as they affect empathy. Age, for instance, at least from a developmental perspective, has been shown to be positively related to empathic development. Sex is also a prominent factor, with females consistently reporting higher empathy than males in the majority of studies (Barnett, Howard, King, & Dino, 1980; Baron-Cohen & Wheelwright, 2004; Eisenberg & Lennon, 1983; Feshbach & Roe, 1968; Gawronski & Privette, 1997; Mehrabian & Epstein, 1972, etc.). Further, parenting behaviour and early socialization experiences have also been reported to play a significant role in empathic development (Hoffman, 1982, etc.). In one study (Eisenberg-Bern & Mussen, 1978), adolescent boys who were high in empathy reportedly had more affectionate mothers than those who were low in empathy. Kim & Rohner (2003) reported that emotional empathy in Korean university students was positively associated with the degree to which they had been accepted by their parents in childhood. Of particular interest are the findings that girls' emotional empathy was related to perceived maternal acceptance whereas boys' emotional empathy was related to paternal acceptance.

Many researchers have espoused the importance of the family environment in the development of empathy, especially with respect to positive parental influences (Barnett, 1987; Eisenberg & Fabes, 1998). Davis (1994) speculated that the home environment is extremely influential to the way in which empathy is shaped. In addition to the quality of

family relationships, such elements as parents' own empathy, specific parenting, and disciplinary techniques are also significant components of a child's empathic development. In a study of adolescent perceptions of their family environments (Henry, Sager, & Plunkett, 1996), 149 adolescents (M=74, F=76) participated in a study examining how three levels of the family system (overall characteristics, parent-adolescent dyadic behaviors, and adolescent self-esteem) were related to empathy dimensions. This was assessed with the Davis (1983) Interpersonal Reactivity Index, which measured four dimensions of empathy: empathic concern, personal distress (emotional dimensions), perspective taking, and fantasy (cognitive dimensions). The adolescent qualities of self-esteem and communicative responses were measured, as were the sub-variables of parental support, induction, love withdrawal, and punitiveness (Peterson, 1982). The findings supported the idea that adolescents' perceptions of the family system are associated with reports of their own empathy. Parental support also correlated strongly with the two emotional aspects of empathy (empathic concern and personal distress). Parental induction was highly correlated with adolescents' cognitive empathy, and substantial support was found for the relationship between self-esteem and communicativeness and empathy, and girls were higher than boys on all dimensions of empathy. Interestingly, age was positively related to the cognitive aspect of perspective-taking, and negatively related to the emotional aspect of personal distress.

Several studies have specifically examined the relationship between parental warmth, and children's empathy. For instance, one group of researchers (Zhou et al., 2002) found that aspects of parental socialization and children's empathy are related, and that parental behaviour affects empathy and social functioning. Interestingly, they also

speculated that children's empathy evoked parenting behaviours. Another research team (Liew et al., 2003) examined physiological measures of empathy (heart rate, skin conductance, etc.) and how they regulated socioemotional adjustment, and whether this relationship was mediated by maternal expressivity. Using a sample group of 154 children, (mean age= 9 years, 5 months), data were collected from the children, their parents (146 mothers, 8 fathers), and teachers. The children participated in three forms of data collection—physiological, observational, and questionnaires—whereas the parents and teachers only completed questionnaires. It is perhaps worth noting that in two of the above studies (Liew et al., 2003, Zhou et al., 2002), the sample population was comprised of children from middle-class homes. Further, there was no information with respect to home environments (i.e., single- or two-parent families).

Abraham, Kuehl, and Christopherson (1983) examined the relationship between age, empathy development and parental behaviour and found that a humanistic type of discipline was positively related to empathy. More specifically, there was a stronger relationship between maternal behaviour and empathy than with paternal behaviours and empathy. Maternal behaviours were evident at various ages with respect to Limit Setting, Reasoning Guidance, Free Expression, and Intimacy. However, paternal behaviours were evident only with respect to Limit Setting and Reasoning Guidance. The maternal Limit Setting behaviour was negatively associated with Borke scores for five-year olds, but not for three- and four-year olds. Intimacy was negatively associated for three-year olds, but not significant for four- and five-year olds, whereas Free Expression was positively associated for three-year olds, but was also insignificant for four- and five-year olds. Reasoning Guidance of mother was positive at all ages.

It was speculated that children might perceive differences in sex roles as they mature, making them less receptive to empathic aspects of paternal behaviour. It was also suggested that parental behaviour might reinforce certain developmental characteristics such as empathy. Nonetheless, it was clear that both parental behaviours, and especially maternal behaviours, were differentially affected by the child's age. This was attributed to the potentially subtle, yet different ways in which children respond to their parents at ages three, four, and five, and their behaviour at these stages as related to cognitive, social, emotional, and physical changes. One alternative explanation that was offered was that certain parenting behaviours actually reinforce developmental characteristics of children of a particular age, thus resulting in positive or negative empathic trends in the child.

Zahn-Waxler and Radke-Yarrow (1990) also explored several parenting behaviours for the way in which they influenced children's socialization and empathic development. They reported that parental depression may stimulate in children too much empathy which can lead to guilt, distress, and confusion about boundaries between one's own and another's problems, and ultimately may hinder the growth of autonomy. Another factor was marital discord, which often burdens children with an unrealistic sense of responsibility when attempting to ameliorate parental conflict. Thus, a child's sense of helplessness may contribute to a negative consequence of empathy. Finally, and perhaps most logical, was the negative impact that parental maltreatment can have on a child's empathy development. Children who have a poor attachment relationship with caregivers, or who have hostile and unempathic parents, are more likely to withdraw,

aggress, or to experience other negative results when attempting to establish connections within their peer group.

A number of studies also show that the effects of parenting on individuals persist on affecting empathy well into adulthood, particularly with respect to a humanistic discipline approach. An early study (Barnett et al., 1980) explored antecedents of empathy as related to early socialization experiences with respect to parenting, based on three dimensions of the parent-child relationship: (1) parents' affection for the child; (2) parents' emphasis on the child's feelings and the feelings of others; and (3) parents' empathy. As predicted, the retrospective account of early experiences revealed that the high- and low-empathy groups differed on a variety of dimensions. Specifically, subjects in the high empathy group reported that their parents had spent more time with them, had been more affectionate, and discussed feelings with them more often than these items were reported by individuals in the low empathy group. Again, females were significantly more empathic than males. Furthermore, more than males, females reported that their mothers had discussed their feelings with them and that both parents had generally exhibited more affection.

An extensive 26-year longitudinal study (Koestner, Franz, & Weinberger, 1990) examined parent behaviour in early childhood, which again emerged as a predictor of empathy in adulthood. Specifically, the researchers investigated the relationship between 11 parenting dimensions when subjects were aged five, and empathic concern when they were 31. It was pointed out that very little research has been conducted concerning early parenting practices and later adult levels of empathy, and that a longitudinal study appeared necessary in order to demonstrate the relationship between the two. Based on

supporting literature, three major hypotheses were put forth. First, that paternal involvement would facilitate the long-term development of empathic concern. Secondly, that mothers' tolerance of dependent behaviour would be positively associated with the development of empathic concern. Finally, parental affection, as determined by warmth, would be positively correlated to empathic concern. It was also expected that females would demonstrate higher empathy than would males.

The first data collection took place when the 379 children were five years old. At this time, the mothers of the subjects were interviewed regarding their parenting behaviours and those of their husbands. This may have actually been a limitation to the study, given the subjective nature of the assignment. However, from these interviews, eleven parenting dimensions, eight maternal and three paternal, were revealed through factor analysis. The maternal dimensions were warmth, strictness, sexual restriction, inhibits aggression, tolerates dependency, satisfaction with role as mother, use of physical punishment, and use of praise. The paternal dimensions were involvement in child care, firmness in discipline, and warmth. Further, to control for the speculation that parental behaviour may have actually been an effect of children's behaviour at the time, teachers' ratings of the five-year old subjects on six dimensions of their behaviour were solicited. Mothers were also interviewed regarding the general behaviour of their children.

The study was followed up when the subjects were 31 years of age. Of the original 379 subjects, 75 participated. To determine whether the sample was comparable with the original group on both demographic and parenting variables, *t*-tests were used for both empathy and personality measures. The use of the personality measures was intended to control for the fact that the measure of empathic concern was not a widely

used measure. An adjective checklist measured empathic concern, and social motives and values were also measured. In addition to the original eleven parenting dimensions variables, sex was also entered into the regression equation. A significant multiple r of .60, $F(8, 67)=4.63$, $p < .001$ determined that the parenting dimensions were significant predictors of empathy at age 31. Further, paternal involvement in child care ($\beta=.37$) and maternal tolerance for dependent behaviour ($\beta=.26$) emerged as significant predictors of empathy. Marginally significant effects ($.05 < p < .10$) were also found for maternal inhibition of child aggression ($\beta=.19$) and maternal role satisfaction ($\beta=.18$). Females also scored higher on the empathy measure ($\beta=.17$). Interestingly, maternal and paternal warmth did not appear to be related to empathic concern. There was also a positive correlation between empathic concern and sociable and nonaggressive behaviour in childhood, as described by mothers.

Overall, the parental behaviours that were most predictive of empathic concern were amount of time spent with the child. It was noted that influence of paternal involvement was remarkable, as this single dimension accounted for a greater percentage of variance in empathic concern (13%) than a combination of the three strongest maternal predictors. Although the childhood data were collected when the subjects were only five years of age, it was concluded that when parents are involved with their children, affiliative needs are addressed and aggressive needs inhibited, they appear to be empathically concerned adults. Finally, the authors conceded that these findings were in direct contrast to research on the role of genetic factors related to personality, and suggested that parenting behaviours can indeed have a lasting effect on children's personality development.

In an important study of disciplinary behaviour in childhood and its impact on adult empathy, Lopez, Bonenberger, and Schneider (2001) investigated the relationship between parental discipline techniques and empathic development. The two parent discipline styles that were compared were power assertion and induction. The former is a method in which parents use their power in order to force or compel a child to change his/her behaviour. This strict style included spanking, scolding, and time-outs. The latter method included more humanistic interventions, through which consequences and rationales are explained. Typically, inductive techniques and nonaggressive punishment have been associated with delays in toddler misbehaviour, whereas techniques which are likely to evoke fear and anxiety hinder the development of empathy. Accordingly, it was hypothesized that young adults who experienced high levels of aggressive discipline would be less empathic than those who experienced low levels of aggressive discipline. Further, it was also expected that there would be a positive correlation between inductive discipline and high levels of empathy and moral development.

The experimental group included 63 females and 39 males ($n=102$) with a mean age of 19.67 years. They completed questionnaires related to discipline styles they experienced as children, and provided demographic information, which were also considered to be predictor variables for empathy. To determine disciplinary experiences, scales from two different instruments were combined. First, three of the subscales from the Conflict Tactics Scale (CTSPC) (Straus, Hamby, Finkelhor, Moore, & Desmond, 1997) were used to assess aggressive discipline. Psychological Aggression included threats of violence, yelling, and verbal abuse. Minor Assault included spanking and corporal punishment. Hitting the child with objects or violent physical abuse was

considered Severe Assault. Inductive intervention was assessed using the Induction and Non-aggressive Power Assertion sub-scales from the Behaviour Transgression Scale (BTS) (Lopez, Schneider, & Dula, 1999). This was comprised of 20 hypothetical situations, which are representative of four types of pre- and adolescent behaviour transgressions. Subjects were asked to rate the likelihood of a parent using one of the interventions addressing each transgression when the subject was between 8-13 years of age. The BTS yielded scores for overall Induction, Aggressive Power Assertion (spanking and verbal aggression), and Non-Aggressive Power Assertion (time-outs and withdrawal of privileges). Finally, the Mehrabian and Epstein (1972) Questionnaire Measure of Emotional Empathy (QMEE) was used to assess empathy.

The predictor variables for empathy consisted of the demographic factors of gender, age, and person in charge of discipline, parental use of induction (BTS), non-aggressive power assertion (BTS), major and minor physical discipline (CTSPC), and psychological aggression (CTSPC). Three variables were significantly related to empathy. The first, as expected, was parental use of induction, which was positively correlated to empathy. The second variable was the use of minor corporal punishment, which was negatively related to empathy. Although no other discipline style was related to empathy, it was pointed out that very few participants reported the experience of severe punishment, which would likely predict lower empathy. The third variable that predicted empathy was gender, with females scoring an average of 18.72 points higher than males ($\beta = -18.72$, $p = .01$).

Sex and gender differences. As indicated throughout this review, empathy researchers have often addressed the phenomenon of females typically demonstrating

higher empathy than males, although the specific question of gender orientation is limited (Karniol, Gabay, Ochion, and Harari, 1998). Carlozzi & Hurlburt (1982) explored the relationship between empathy and feminine expressiveness, and between empathy and masculine instrumentality, in 51 graduate students with an average age of 30.3 (M=33.3%, F=66.7%). The study emerged from two premises. First, that feminine traits have been typically associated with expressive orientation, which is an affective concern for the relationship between self and others, the welfare of others, and the tendency to be interpersonally sensitive. The second premise was that masculine traits are associated with instrumental orientation, a more independent perspective that cognitively focuses on task completion and problem-solving.

Surprisingly, while expressive traits and empathy were positively related, no support existed for the hypothesized inverse relationship between instrumentality and empathy. Further, no significant differences were found between males and females. However, it is important to note that although there were initial distinctions made in this study between masculine and feminine traits, gender was actually examined, rather than gender-orientation, which may have yielded a different picture.

In a more recent study of adolescents, Karniol, Gabay, Ochion, and Harari (1998) investigated whether empathy was better predicted by gender or gender-role orientation and found that gender-orientation was indeed a significant predictor. While girls were higher in empathy than boys, and empathy and femininity were found to be highly correlated, a negative correlation was not found between empathy and masculinity. In other words, all individuals, irrespective of gender, who were rated high in femininity, had higher empathy, and those high in masculinity demonstrated lower empathy. The

researchers speculated that being female, or being high in femininity, is a “releaser” of empathic tendencies.

Although one of the most consistent findings throughout empathy literature is that females are more empathic than males (Barnett et al., 1980; Baron-Cohen & Wheelright, 2004; Cohen & Strayer, 1996; Eisenberg & Lennon, 1983; Jenkins et al., 1992; Kaplan & Arbuthnot, 1985; Koestner et al., 1990), reasons for this have been inconclusive. The most common speculation is that social roles have traditionally dictated that empathy and nurturance are important characteristics for women to develop (Lennon & Eisenberg, 1987). However, Lennon and Eisenberg (1987) reported that empirical data supporting this tenet is surprisingly scarce, pointing to their extensive review of literature (Eisenberg & Lennon, 1983) as evidence. In this study (Eisenberg & Lennon, 1983), the researchers examined empirical studies in which similar empathy measures were used. They found that gender differences are not necessarily related to empathy, but to the way in which empathy is operationalized. Gender differences varied according to what type of measure was used. However, the researchers (Lennon & Eisenberg, 1987) also cautioned that these results may suggest that the differences may lie in the types of emotions that the instruments measure, and sought to further examine potential reasons for the reported sex differences (Lennon & Eisenberg, 1987). However, the majority of studies in which females are more empathic than males are based on self-report measures, on which women typically show higher empathy than physiological measures. The researchers offered two possibilities for this consistent finding. The first was that males and females might actually respond in ways they believe to be consistent with sexual stereotypes. A

second speculation was simply that women are more likely to respond empathically or experience emotional distress differently than males.

Although variables that predict empathy, such as parenting styles and aggression, comprise a large body of the literature, there are also several isolated studies that explore unique variables that also appear to correlate with empathy. For instance, in a study of attitudes towards AIDS (Royse, Dhooper, & Hatch, 1987), undergraduate and graduate students contributed to an exploration of how a fear of AIDS was associated with knowledge about the disease, and empathy towards persons with AIDS. It was reported that more knowledge about AIDS was related to greater empathy for individuals with AIDS, suggesting that the more individuals become educated about the subject, the more empathic they become. A particularly unique finding, however, and perhaps inconsistent with the previous assertions, was that higher chronological age appeared to predict lower empathy. The authors suggested that this may reflect idealism in the younger students, or their greater acceptance of diverse lifestyles. However, this is a brief report, and thus conclusions should be considered with caution. Moreover, it was a relatively early study (1987), and it is thus likely that there were still many misconceptions and unknown facts with respect to AIDS.

A similar finding with respect to age was reported in a study (Pennington & Pierce, 1985) of nursing home staff members and their empathic interactions with residents, in which younger employees were found to have higher empathy than older employees. The researchers investigated whether seven demographic variables, independently or as a combination, served as predictors of the amount of empathy the staff members showed toward the residents. The predictor variables were sex, age,

employment status (full-time vs. part-time), length of work experience, education, type of institution (profit vs. nonprofit), and occupation. Empathy was the criterion variable. The 127 subjects worked within 11 long-term care facilities and were comprised of nurses' aides (39%), licensed practical nurses (16%), registered nurses (7%), and nurse supervisors (6%). The remaining 16 occupational categories ranged from social workers, secretaries, and kitchen helpers.

A significant relationship was reported between the combination of the seven demographic variables and empathy. However, only two of the seven demographic factors predicted a significant amount of empathy as a result of the multiple regression. They were work experience ($\beta = -.46$) and, as previously mentioned, age (60 years and over) ($\beta = -.82$). Individuals who had worked in the facility for one year, or for six years or more, demonstrated the least empathy. The researchers provided several speculations, with respect to differences for Age, for these results. The first was that older employees inhibit their displays of empathy from fear of becoming like the individuals whom they currently care for. While a second consideration was that younger employees were more likely to have had empathy training, this speculation was investigated and dismissed when it was discovered not to have been the case. A plausible reason was that older staff members suffered from burn-out, particularly because of the tendency of burned-out workers to respond to their patients in a caretaking fashion, rather than provide warmth and support. Further, those who are in their first year of the profession have not yet developed empathy in accordance with experience. With respect to the variable of "length of work experience," those who worked in the field for one to five years demonstrated the highest levels of empathy.

In a study of the relationship between personality aspects and empathic responding in graduate students in counseling (Jenkins, Stephens, Chew, & Downs, 1992), only the Thinking-Feeling (TF) scale of the Myers-Briggs (1987) Type Indicator was significantly associated with empathy. The Myers-Briggs Type Indicator is a personality inventory comprised of four bipolar scales: There was no correlation with the remaining three scales of Extraversion-Introversion (EI), Sensing-Intuition (EI), and Judging-Perception (JP). In addition to the Thinking-Feeling scale being positively correlated to empathy, sex and graduate grade point average (GPA) were also positively related to empathic responding. With respect to the TF scale, higher empathy was associated more with the Feeling component than the Thinking component. However, it was suggested that because of the positive association of GPA with empathy, intellectual proficiency may be related to empathy. Overall, with the exception of TF, there was not a strong relationship between the Myers-Briggs scales and empathic responding.

Clearly, there are demographic and psychological variables that are related to empathic development. Eisenberg has addressed many of the aspects associated with the development and conceptualization of empathy (Eisenberg & Fabes, 1990; Eisenberg & Mussen, 1978; Eisenberg & Strayer, 1987), including sex differences (Eisenberg & Lennon, 1983) and its correlation with prosocial behaviour (Eisenberg et al., 2002), factors which have emerged in the first part of this literature review. There exists compelling evidence that parenting styles, behaviour, personality traits, age, and sex all are important factors that contribute to empathic development at some stage in an individual's life.

Biophilial Determinants of Empathy

Background of Human-Animal Research. While there is clearly a case to be made for the influence of biological, psychological, and demographic factors on the development of empathy, a significant body of research indicates that relationships and experiences with animals influence, to some degree, the development of positive human qualities, including empathy. Eisenberg (1988), who has done extensive research in the area of empathy, has suggested that empathy development has important roots in the area of human-animal relationships. In fact, a number of researchers have contributed to the growing body of research investigating the empathic effects that pet-ownership and pet presence have on individuals, both as children and adults.

Boris Levinson (1962, 1964, 1965, 1970, 1978) is considered to be a formidable force in initiating research in the area of human-animal relationships, and is essentially a pioneer in the field (Beck & Katcher, 1996; Davis & Juhasz, 1985; Gonski, 1985; Nagengast, Baun, Megel, & Leibowitz, 1997). In the first of a number of theoretical articles, Levinson espoused the psychological importance of pets for humans, furthering that companion animals may even compensate for human contact in their provision of unconditional love and affection (Levinson, 1962). Further, it was asserted that house pets, and in particular, dogs, satisfy in humans a critical psychological need, which people mistakenly identify as a simple love of animals. In subsequent writings, Levinson coined the phrase "pet therapy" (1964), and addressed ways of introducing pets to interactive therapy sessions with children (1965). It was the author's belief that children would feel more secure in confiding in a pet than a therapist, and in this way could comfortably express their needs through the animal. The therapist's own dog, Jingles,

was observed to bridge the gap in this manner, as well as assist the child in overcoming discomfort in the initial therapeutic encounter (1965). It was also speculated that keeping pets in home environments could provide similar benefits. Levinson (1970) referred to these particular pets as “seeing heart” dogs.

Essentially, Levinson (1979) speculated that pet-keeping would have a significant impact on individuals, who would reap benefits distinct from those of non-owners. Acknowledging that psychological research had been neglected in this area, it was hypothesized that owning a pet would facilitate the development of adaptive personality traits, including self-esteem and empathy. Consequently, a steadily increasing body of research has followed Levinson’s initial work and has strongly and consistently accorded with the researcher’s initial speculations and observations.

In fact, it could be said that Levinson’s appeal for the use of pets in therapeutic settings and as a means of personality development sparked a research phenomenon. The complex and integral relationships that people have with animals has a deeply rooted historical context, as Wishon (1987) reported. The relationship that humans have with animals was characterized as a moral commitment that merited further attention for its positive implications with respect to human-human relationships. It was also noted that pets have value for the physical, mental, emotional, and social well-being of an individual. Pet-keeping patterns in different societies reveal the historical significance of various types of pets. Dogs in particular were noted for the selective breeding throughout the years that has made them virtually a creation of human beings. In addition to providing emotional support for humans, dogs and people inherently developed a mutual

dependence upon one another through hunting, as neither might have survived without the other.

Grier (1999) also examined the historical importance of pet-keeping for the socialization of children in the Victorian era (1820-1870) and, like Wishon (1987), maintained that keeping pets was ultimately a “morally purposive act.” Many individuals regarded animals in the household as a means of teaching children about kindness to others, as well as deterring them from causing pain to all living things. Mothers, who often initiated and encouraged pet-keeping practices in the home, were primarily responsible for proper socialization of children and for guiding their family members toward kindness and compassion. This resonates with the demographic influence of parental behaviour on children, especially the role of mothers. Consequently, the morally evolving cultural climate, which was attributed to a mentally healthy and successful middle-class, brought about a new emphasis on humane education. Through this lived humane education, it was believed that children would learn the “law of human kindness” both through daily interactions with animals, and by observing parental role models who also embraced the same humane ideals. Grier (1999) pointed to experience, rather than instruction, as the contributor to moral sensibilities, a notion which again resonates with claims addressed earlier in this review (e.g., Eisler & Levine, 2002). For instance, hunting for sport, as opposed to necessity, was regarded as eroding empathy and self-control. Further, violence toward animals, which was not uncommon in public during the 18th and 19th centuries, was regarded, especially in boys, as a dangerous quality that could persist into adulthood toward human victims, such as women and children. As such,

learning kindness was regarded as particularly important for boys to suppress what was seen as a natural inclination toward aggression.

The Biophilia Hypothesis

Given the historical speculation that pet-keeping practices are antecedents to moral behaviour and kindness, the empirical studies that emerged from this basis were clearly warranted. Further, the recent prominence of research into human-animal relationships and its implications for empathy development invite a new interest in the biophilia hypothesis (Wilson, 1984). The biophilia hypothesis may provide a broad theoretical and unifying framework for understanding empathy as it emerges from both an innate, biological infrastructure (nature) and environmental and demographic influences (nurture). The biophilia hypothesis holds that individuals have an innate tendency to attend to animals and nature. In expounding on Wilson's (1984) theory, Kellert (1997) points to human coevolution with other species as evoking an affiliation with nature, and emphasizes this connection as a necessity. In essence, biophilia evokes responses that can be regarded as adaptive benefits that contribute to a richer and more meaningful enjoyment of nature.

What makes biophilia a particularly attractive theory for conceptually integrating nature and nurture with respect to empathy is that, by its very nature, it is a synthesis of biological, learning, and experiential components, based on individual opportunity and social support (Kellert, 1997). Kellert (1997) pointed to aspects of biophilia as a result of biocultural evolution, requiring innate tendencies to be shaped by culture and experience. This resonates with the very heart of the conflict among empathy theorists, many of

whom concede that empathy is most strongly impacted by a combination of internal and external factors (Plutchik, 1987; Thompson, 1987).

While Kellert (1997) asserted that biophilia is not “hard-wired” in individuals, they are born with an innate connection to other living things, which is especially evident in children. Emotions and personalities of animals (fictional, real, imaginary, etc.) are immediately evident to children in the same way that they are evident with respect to other children. As such, biophilia is a natural attraction to animals and other living things, a product of the coevolution of people and animals and their historically mutual dependence on one another (Melson, 2001). With this in mind, then, it may be that the effects of positive and early experience of pet-keeping, or pet presence, in childhood persists into adulthood. Thus, it follows that, as speculated earlier, adults’ relationships and attitudes toward animals may be explained, in part, by early experiences. In fact, the nature of human attachment to pets might be better explained by the biophilia hypothesis, the core of which is the coevolution of people and animals. In other words, human beings are predisposed to be attracted to living things in order that they may coexist with one another.

In elaborating on the initial conception (Wilson, 1984) of his theory, Wilson (1993) explained that evidence of biophilia is rooted in “pure evolutionary logic.” Historically, hunter-gatherer groups coexisted with other organisms, which made their intimate knowledge of other living things a practical necessity. As the natural progression of language and culture unfolded, the brain’s evolution was the result of a biocentric, not a machine-regulated, world. It is not realistic, the author contended, that natural learning rules do not remain biologically imprinted.

Wilson (1993) contended that there is indeed evidence in everyday life that supports the biophilia hypothesis. For instance, more people visit zoos in the United States and Canada than attend major professional sporting events, and individuals constantly seek to build expensive homes in wooded areas and on waterfront properties. This is consistent with Kellert's (1993) assertion that the biophilia hypothesis suggests that personal fulfillment and identity is dependent on one's relationship with nature.

Although the field of environmental psychology is limited, Ulrich (1993) pointed to empirical evidence supporting a genetic basis for biophilia. For instance, excavations from East Africa indicated that even the earliest settlers located their camps near water, a survival instinct. Further, Ulrich indicated that research findings show a consistent liking or preference for natural settings containing water features, including studies involving young children. Natural scenes are typically preferred over urban settings, and environments containing natural elements produce more positive feelings than those environments lacking natural features.

Katcher and Wilkins (1993) maintained that the evolutionary role of biophilia can be explained by two assumptions evident in human-pet relationships: the ability of animals to evoke speech from humans, and the tendency of humans to consider animals (i.e., pets) as kin. The biophilia hypothesis not only predisposes individuals to attend to living things, but also provokes a tendency to incorporate animals into a social environment. This aligns with Melson's (2001) premise that the biophilia hypothesis helps to "clarify the phenomenon of social lubrication."

As part of an evolutionary attunement to surroundings that is rooted in the "hunter-gatherer" profile, individuals' genes are still predisposed to respond to calm,

friendly animals, a sign of which is safety (Melson, 2001). Katcher & Wilkins (1993) pointed to two events in nature, with consistent properties, that are associated with calm, and the absence of danger: Heraclitean motion, which is a pattern of always changing yet always staying the same, and the psychological association of comfort and safety. Examples of this include the movement of aquarium fish, farm animals grazing, the ebb and flow of water on a shoreline, and fire in a fireplace. Conversely, events that signal danger are animals breaking into a run, a fire burning out of control, and the change in water patterns before and during a storm.

It seems inconsistent with human nature, then, that certain technological advances should be regarded as a somewhat natural aspect of human progress. Katcher & Wilkins (1993) cautioned that the preservation of habitat and species is the moral agenda of the biophilia hypothesis, and that political and technological changes in contemporary society require a caution be paid to the trends inherent in these changes. In other words, the current cultural climate dictates people's actions, such as destroying wildlife for the purposes of building, rather than fostering its preservation. More specifically, they point to the marginalization of animals that is becoming more evident since the industrialization of the 19th century.

Child-Pet Relationships. Consistent with this historical perspective, a more recent research investigation (Fifield and Forsyth, 1999) also found that one of the primary reasons that parents obtained pets for their children was because they believed it was a means of teaching responsibility, love, and respect. This supposition has received a vast amount of empirical support. For instance, Siegel (1995) found that pets really were of great importance to adolescents, and investigated their feelings about their pets, as well

as whether the nature of the relationship varied as a function of age, gender, racial group, family income, housing type, and family structure. A large household sample size ($N=13,925$) included an over-sample of African and Asian Americans in order to control for typically underrepresented groups. Once households were screened for 12 to 17 year-olds, 877 adolescents ($M=53\%$, $F=47\%$) contributed to the sample population. The racial-ethnic composition included Latinos (49%), Whites (26%), African Americans (11%), and other cultural backgrounds (4%). Family income was determined from parental interviews. The majority of the subjects (56%) lived with both parents, or one parent and a step-parent (14%), and 27% lived with one parent. Most lived in detached homes (55%) or multiple dwelling units (45%). Almost half (44%) lived in households where the family income was less than \$30,000. Of the 50% of the 877 adolescents who owned pets, 30% were dog owners, 18% owned cats, and 10% owned birds. An additional 11% owned fish or other pets.

The interviews were comprised of a highly-structured process that allowed for both fixed- and open-ended responses. It included questions regarding emotional distress, problematic behaviour, social stressors, coping resources and behaviours, and socioeconomic and demographic family variables. With respect to the probability of owning a pet, neither gender, age, number of siblings, nor family structure were related to ownership. Rather, a group of the interrelated variables (race, income, and type of dwelling) were related to pet ownership. Whites were most likely to own a pet (75%), followed by Latinos (47%) and Asians (43%), while African Americans were least likely to have pets in their home (37%) ($\chi^2(3)=54.5$, $p < .001$). Pet ownership was also

positively related to higher household income ($\chi^2(2) = 37.49, p < .0001$) and residing in a single family home ($\chi^2(1) = 87.34, p < .001$).

Approximately two-thirds of respondents indicated that their pet was either “very” or “extremely important” to them. Interestingly, neither gender, age, family structure, nor dwelling type were related to ratings of importance, although Whites rated their pets as significantly more important than did Latinos. However, it is worth noting that while Latinos comprised almost half (49%) of the sample and Whites comprised only 26%, Whites were a more likely group of pet-owners (75%). Income was also positively related to importance ratings ($r(436) = .11, p < .05$). Further, dog and cat owners rated their pets as more important than did fish owners, and bird owners did not differ significantly from any of the other pets

In determining whether sole responsibility for the pet was related to demographic variables, again, racial group was most related to the likelihood of having responsibility for one’s pet (African Americans=30%, Latinos=21%, Whites=14%, and Asians=5%). Further, adolescents in blended families were most likely to be the sole caretaker of the pet. Overall, it was surmised that pets play an important role in the lives of adolescents. It is also interesting to note that while only 56% of the adolescents resided with both parents, there were no reported differences with respect to parental marital status and ratings of importance. This lends further support to the claim that pets were considered to be important members of the family that could serve as potential stress buffers during typical but difficult transitions encountered by individuals during this phase of their lives.

A number of other researchers have also argued for the importance of pets in the lives of preadolescents and adolescents. Robin & ten Bensel (1985) suggested that

companion animals made an important contribution to the development of self-esteem, responsibility, competence, autonomy, and empathy. Kidd & Kidd (1990) reported that pet ownership might be an important benefit for adolescents who are experiencing difficulty in obtaining independence or need to achieve more mature, external relationships. Davis and Juhasz (1985) discussed the relationship of the human-animal bond for its contribution to prosocial development, particularly for preadolescents, concluding that pets serve as both playmates and objects of responsibility for young children. Companion animals are consistently available, are non-threatening playmates, provide nonjudgmental and unconditional love, and are essentially an ego-extension that enhances self-esteem. Furthermore, youth learn responsibility through care and attention toward their pet

In a later study, Davis and Juhasz (1995) reported that pets were indeed important family members to adolescents. It was theorized they could provide the empathic friendship needed by youths. The researchers distributed a 26-item list to 122 middle-class pet owners, aged 10-12 (M=46%, F=53%). The list included statements requiring the individuals to match the relationship between them and their pet, ranging from "Exactly Alike" to "Not Like." Dog owners comprised 58% of the group. The next most common pet was the cat, followed by fish. Overall, the subjects demonstrated a very high regard for their pet. The preadolescents also experienced decreased loneliness as a result of having a pet and they perceived their companion animal to be a provider of empathic and complementary friendship.

Several limitations to the study are worth noting. The study was conducted on students from seven schools of similar socioeconomic status. Although the schools were

comprised of parochial, public, and Montessori, the participants were predominantly white and resided in middle-class homes with both parents. Accordingly, there may have been other contributing factors, perhaps related to parental involvement or shared care of the pet, that may have impacted the results of the study.

Poresky & Hendrix (1990) pointed out that empirical reports often do not distinguish between pet attachment and pet presence, and thus to attribute benefits to one or another is presumptuous. A series of research articles utilizing the same subject population produced inconclusive results. The first study (Poresky & Hendrix, 1990) examined the effects of pet bonding versus pet presence on young children's development. It was expected that children who were deemed closer to their companion animals, according to their mothers' ratings of the CABS, would score higher on the developmental measures than those who were not close to their pets. In fact, this was the case. Similarly, the children's CABS scores were moderately correlated with their empathy score ($r_{27}=.52, p < .01$). The authors thus reported that children enjoy developmental benefits associated with pet ownership based on the quality of the relationship, not simply the presence of pets in their homes. However, it is important to note that children who participated in the study were only aged three to six, and the children's mothers assessed the quality of the child-pet relationship, which may not have provided an accurate or objective picture of the quality of the child-pet relationship.

In a concurrent paper, Poresky (1990) looked at the effects of a pet on empathic development on 38 children, aged three to six. Empathy scores were positively correlated with age, which, from a developmental perspective, was expected. Further, while children who had a strong bond with their pet did report higher empathy scores than those without

a pet, empathy scores did not significantly differ between children with pets and children without pets. In a later study, Poresky (1996) reported on the child-pet bond, the quality of the home environments, and the developmental context of age. It was indicated that there was a trend toward higher empathy with children who exhibited strong pet bonds. However, since all the studies utilized the same research group, it seems appropriate to interpret the findings accordingly. Though speculative, there does appear to be some support for the idea that the quality of a child's relationship with a pet plays some role in mediating empathy, the question still remains whether pet ownership *per se* has any effect on empathic development.

Melson, Peet, and Sparks (1992) also investigated attachment to pets among children as it related to empathy and perceived competence, but again used parents' perceived ratings in order to determine the level of attachment. The subjects were 120 pet owners from kindergarten, second, and fifth grades. While various components of pet attachment were reported, the modest correlations suggested that attachment is expressed in different ways. The demographic variables yielded varying results. There were relatively few sex differences, but older students exhibited greater emotional attachment than younger students, a likely indication of cognitive maturity. There was also a positive correlation between mothers' work hours and affective pet attachment, suggesting that employed mothers give their children more responsibility for the pet, or that children substitute the pet for an attachment object in the absence of their mothers.

Finally, there was only limited support for the relationship between attachment to pets and both empathy and perceived competence. Thus, as with the earlier studies by the

Poresky (1990, 1996) research team, the results with respect to the relationship between pets and empathy are inconclusive.

In an examination of the relationship between children's companion animal bonding and empathy (Vizek-Vivodic, Stetic, & Brake, 1999), investigators examined socio-emotional development as indicated by attachment to pets, empathy, prosocial orientation, loneliness, social anxiety, and perception of family climate. The study was comprised of children from grades four, six, and eight, ranging in age from 10 to 15 years. Of the 826 subjects, 449 (54.4%) owned pets and 377 (45.6%) did not. Dogs were owned by 26.2% of the sample group, 9.2% had cats, and 19.9% had other pets. With respect to gender, girls were more attached to their pets than boys, but only as related to dogs and cats. Girls were also more empathic than boys, with eighth-grade boys scoring lowest on the empathy scale. Girls were also more prosocially oriented, and girls who owned dogs were more prosocially oriented than both male and female non-owners. Girls were reportedly less lonely than boys, and had better perceptions of family environment. Again, that attachment to pets mediates empathy is unclear. For instance, in this particular study, it could be that the prosocial behaviour is mediating empathy, which has theoretical support (Hoffman, 1982). Thus, that pet attachment affects empathy more than presence of, or attitudes toward, pets, may not be as evident as Poresky (1990) speculated.

In fact, other studies that have not necessarily examined pet attachment still found a positive relationship between the presence of pets and empathy. In a study of preadolescents, Van Houtte and Jarvis (1995) reported, curiously, that pet-owners were not more attached to animals than non-owners were. Pet-owning and non-owning groups

were matched on a number of variables including parental marital status and social class. It was generally hypothesized that autonomy, self-concept, and self-esteem would increase from grades three to six due to the developmental process. Further, it was specifically hypothesized that the pet-owning group would demonstrate higher attachment than the non-owners, and that this attachment would be related to higher scores of autonomy, self-esteem, and self-concept.

The autonomy measure consisted of 20 items that measured four components. The first two, which measure cognitive aspects, were “perceives parents as people” and “parental deidealization.” The second two components, related to affective aspects of autonomy, were “nondependency on parents” and “individuation.” The Self-Concept Scale for Children (Lipsett, 1958) was used to measure self-concept, and Rosenberg’s (1979) Self-Esteem Scale was used to measure self-esteem. For the pet-owning group, attachment to animals was measured using an existing questionnaire, whereas a slightly modified version was administered to the non-owning group. There were 65 participants in each group, and they were matched on parental marital status, socio-economic status (SES), and number of siblings. The length of pet-ownership ranged from 6 months to 1.5 years.

The results partially supported the hypothesis that there would be a general increase on all scores as age increased. For self-concept and self-esteem, there were no significant differences between grade levels. However, while a linear trend of increasing autonomy from third to sixth grade was found, fifth graders were actually significantly less independent than others were. There was also partial support for the hypothesis that pet owners would score higher on the dependent measures than non-owners. While there

were differences on some measures, surprisingly, pet owners were not significantly more attached than non-owners. For the autonomy measure, the pet-owning group scored higher on the “perceives parents as people” subscale, from which it was concluded that pet ownership is positively related to developing autonomy. Also, sixth-grade pet-owners had higher self-concept scores than non-owners did, suggesting that pets have an influence as the individual nears adolescence. Individual pet-owners in third-, fifth, and sixth-grades reported higher self-esteem than their non-owning peers, though only fifth- and sixth-grades were significant.

These findings actually lend support to the notion that the presence of pets, not necessarily an attachment to pets, is what positively impacts individuals. This idea was also supported by another study (Hergovich, Monshi, Semmler, & Zieglmayer, 2002) involving children and pet presence. In an investigation of the effects of a dog in a classroom, it was reported that the animal’s presence in the classroom led to increased empathy and field independence. Forty-six schoolchildren, 6 and 7 years old, in two different classes with two different teachers, and two accompanying teachers in each classroom, participated in the study. The two classes served as experimental and control groups, and the majority of the students were immigrants. No significant differences ($t_{(44)}=0.23, p=0.816$) in intelligence between the two classes were evident. Three dogs were used interchangeably. However, because the dogs belonged to one teacher, assignment was not random, and the teacher was not aware of the full purpose of the study.

Four instruments were utilized, including a measure of field independence, a picture test for measuring social intelligence, self-assessment of empathy with animals,

and teachers' assessments of sociability and social integration. The questionnaires were administered at the start of the experimental semester and again at the end, approximately three months later. During their visits, the dogs roamed around the room and the subjects were free to pet them. Researchers hypothesized that the dog's presence would promote field independence, increase social intelligence, increase empathy with animals, and improve the social-emotional atmosphere of the classroom.

It was found that the dogs' presence had a positive effect on the experimental group, and that field independence and empathy were significantly higher than the control group. Further, the teachers observed that the children in the experimental group were better integrated than the control group after the experimental period, and that the number of aggressive children was reduced by half. While the positive effects of the study reportedly have important implications for the reduction of aggressive behaviour and the social and cognitive development of young immigrant children, there are some limitations that should be noted. First of all, two different instructors taught the control and the experimental groups, thus not controlling for difference in individual teaching styles. Further, because the teacher who owned the dogs taught the experimental group, there was not a random assignment of subjects. Finally, the teachers' assessment of their own students' behaviours before and after the experiment may present a bias in judgment, especially following the intervention. Nevertheless, this study provides further evidence in support of the idea that pet presence, and perhaps even attitudes toward pets, might be just as important as owning a pet.

Adult-Pet Relationships. While much research in the area of child-pet relationships examines the quality of the relationship between children and pets, the

findings are speculative (Melson, 1988; Melson et al., 1992; Poresky, 1990; Poresky et al., 1988). Research examining the effects of presence-of-pet also has suggested support for the benefits of pets, and, in fact, presence-of-pet may be just as valuable as more involved relationships with pets. With respect to the research on adult-pet relationships, a wider range of variables seem to be of interest to researchers than those found in the literature using children as the main participants. For instance, in one particular study (Stubbs & Cook, 1999), it was reported that individuals who strongly dislike dogs are less empathic than those who like dogs. Hyde, Kurdek, and Larson (1983) found that college students with dogs were more empathic. However, the brief report did not identify the extent to which the individuals bonded with their dog, nor did they report a history of pet ownership among the subjects, which Serpell (1981) has suggested is an important consideration when examining the effects of pets on individuals. In fact, Paul and Serpell (1993) found that pet-keeping in childhood influenced humane attitudes in adulthood, including empathy. They examined a variant of empathy (i.e., humane attitudes) in adults as related to childhood pet-keeping. The researchers acknowledged the importance of distinguishing between the presence of pets and the quality of the relationship with the pet. Thus, the first retrospective questionnaire addressed this concern by asking subjects not only to identify whether the pet was an individual or family pet, but specifically to list those pets that were considered to have been important to the individual. The second part of the questionnaire was comprised of questions and instruments to measure emotional empathy (Mehrabian & Epstein, 1972), attitudes toward the treatment of animals (Bowd, 1984), and attitudes toward pets (Templer, Salter, Dickey, Baldwin, & Veleber, 1981) and humans.

Three-hundred and eighty-five subjects (M=230, F=155) participated in the study. the results of which supported the view that childhood pet-keeping contributes to the development of more caring attitudes toward pets as adults. In addition, these individuals also displayed a greater concern related to the treatment and welfare of laboratory, wild, and farm animals. Further, although it accounted only for a small proportion of the variance, empathy toward humans as a correlate of childhood pet-keeping was also evident. Interestingly, the association was detected *only in male subjects*, evident when the sample was split for sex. This was likely due to a ceiling effect because of the typically high empathy scores evidenced in women. Nevertheless, the results pointed to more humane attitudes, as a result of childhood pet-keeping, toward both animals and people. Further, those who deemed their pets to be important expressed more humane attitudes than those who did not.

Whether empathy for pets generalizes to people is also of interest. Paul (2000) investigated whether there existed a link between human-oriented and animal-oriented empathy in adults. The researcher not only examined whether the two types of empathy were correlated, but whether they are likely to be predicted by the same demographic and developmental factors. Because empathy was likely to be influenced by such demographic experiences as marriage and child-rearing, questions related to these factors, as well as past and present pet ownership, were included in the questionnaire of background information. Participants also completed the Mehrabian and Epstein (1972) Questionnaire Measure of Emotional Empathy (QMEE) and the researcher-designed Animal Empathy Scale, which was designed based on the QMEE. The experimental

population was comprised of 497 adults (M = 44%, F = 56%) ranging from 18 to 99 years of age with a mean age of 49.5 years.

Animal- and human-oriented empathy were positively correlated (Kendall's tau = 0.26, $p < .001$, N = 497) for both males (Kendall's tau = 0.25, $p < .001$, N = 216) and females (Kendall's tau = 0.21, $p < .001$, N = 280), who were analyzed separately to control for previous findings, as addressed throughout this paper, indicating that females are generally more empathic than males. Married and single respondents showed no significant differences from one another in human- or animal-oriented empathy, although subjects with children currently living at home scored significantly higher on the human-oriented scale than those who did not (Paul, 2000). However, the researcher asserted that caution should be taken in assuming that individuals who develop empathy for animals in childhood generalize this empathy toward people in adulthood.

Again, although a number of studies have explored the relationship between pet attachment and empathy, the results are inconclusive. In fact, these questionable results may be suggestive of something else having an affect on empathy. For instance, it may be that the human-pet relationship, when formed in childhood, and not necessarily attachment per se, somehow provides a foundation to facilitate the mediation of empathy. For instance, Kidd & Kidd (1989) suggested, based on a large population of adults (N=900), that adult attachment to animals may be a function of having owned a pet in childhood or adolescence. Adults who had owned pets in their youth were more attached to their current pets than adults who currently owned pets but never owned a pet prior to their adult lives.

Another interesting study (Vizek-Vivodic, Arambasic, Kerestes, Kuterovac-Jagdic, & Vlahovic-Stetic, 2001) also examined the relationship between childhood pet ownership and socio-emotional development in adults. While pet attachment in childhood was the initial predictor variable in a pilot study, analyses revealed poor sensitivity in all sub-samples. Consequently, pet ownership in childhood, rather than attachment, was used as the predictor variable. Of the 356 participants, 262 had owned pets in childhood whereas 184 were current pet-owners. Forty-five percent owned pets both currently and in childhood, 28% owned a pet in childhood but not currently, and 19.9% never owned a pet. Only 6% of current pet owners did not have a childhood pet. Dogs were the most frequent pets (26% in childhood, 40.2% currently), followed by cats (9.2% in childhood, 15.8% currently) and birds (9.2% in childhood, 9.8% currently).

A discriminant function analysis was performed in order to determine whether there was a difference in emotional and motivational characteristics between the group of individuals who owned pets in childhood and those who did not. Differences in chosen fields of study (helping vs. non-helping professions) were also examined. The grouping variable in the discriminant analysis was pet ownership during childhood. Predictors were the four measures of socioemotional functioning, value orientations, and field of study. It was found that the highest contributions to the analyses were provided by empathy, an aspect of socioemotional function, and field of study, or career choice. In other words, individuals who had had pets during childhood were more empathic and were also more likely to choose a helping profession than a non-helping profession. Further, those who owned pets in childhood were more oriented toward social values than those who did not. Empathy contributed most to the differentiation of the two groups,

and it was thus reported that pet ownership not only facilitates empathy, but also the development of socially oriented values, which appear to ultimately lead to a professional career choice in which they may develop these values through work experience.

A study by Poresky and colleagues (Poresky, Hendrix, Mosier, & Samuelson, 1988) also furthers the idea that early experiences with pets impact later development. They examined the quality of the human-pet relationship and investigated the early experiences of adults' quality of their relationship with pets in childhood, and its effects in adulthood. Ninety-three percent of the subjects had owned pets in childhood, and 82% currently owned pets. Subjects reported that the pet they felt to be most important was a dog (65%), followed by cat (14%), and horse (8%). Only nine percent failed to identify their most important pet. While a positive correlation between adults who currently owned pets and those who owned pets in childhood was reported, it should be noted that only seven percent of the population did not have a pet in childhood. Adult attitudes toward pets were related to their reported bond with their most important pet, sex, and their age when they first had a pet. Respondents who had a higher retrospective Companion Animal Bonding Scale (CABS) score also had higher Companion Animal Semantic Differential (CASD) scores as adults (F -values ranged from 15.28 to 16.38, $df=3/126$, $p < .001$). Further, those who had pets when in early childhood also had higher CASD scores than those who had pets later in childhood ($F=3.90$, $df=2/126$, $p < .03$). While it was reported that pet bonding had a stronger impact than just pet ownership, these results should be interpreted with caution due to the limited number of participants who did not own pets as children.

What appears to be the most dramatic finding, however, was that individual relationships with companion animals was in fact more significant than relationships with parents, siblings, or classmates ($F = 37.92, p < .001$). While this finding suggests that there may be importance in early human-pet relationships, it also underscores the speculation that some factor, other than only the quality of the early relationship, is contributing to value evidenced in the relationships between pet and people. While theories that argue for a predisposed attraction to animals are “conceptually attractive” (Brickel, 1985), that pet bonding is most heavily associated with the development of empathy remains speculative at best. In fact, Melson (2000) also questioned the soundness of attachment theory in the domain of child-pet relationships and advanced the interesting notion that the biophilia hypothesis might offer a more tenable framework in examining the way in which animals impact children. In fact, it is this intriguing suggestion that may serve as the cohesive factor in uniting the competing claims for the priority of nature or nurture with respect to empathic development.

Implications of the Biophilia Hypothesis. While there are inconsistent findings regarding the nature of the relationship between pet ownership and pet attachment (Daly & Morton, 2003; Poresky & Hendrix, 1990; Vizek-Vivodic, Stetic, & Bratko, 1999; Vizek-Vivodic et. al, 2001), a wealth of research indicates that there is indeed a positive outcome based on some mediating factor of the relationship, particularly with respect to empathy. The question remains as to whether it is being mediated by attachment, attitudes, pet presence, or simply an interest in animals. It may be that additional factors, other than only pet-related variables, are more strongly linked to the development of empathy, and that it is a combination of such that mediates empathy and prosocial

behaviour. For instance, Kellert's (1993) suggestion that biophilia is an evolutionary predisposition resonates with Levinson's (1962) belief that relationships with animals are an intrinsic need for humans.

There are clearly specific and documented variables, then, that relate to empathy in both children and adult populations. While the first part of the review of literature illustrates specific demographic and psychological variables that correlate with empathic tendencies, the most interesting questions emerge from the body of literature that explores the relationship between empathy and pet-related variables. These types of relationships between humans and animals support an interest in the theoretical value of the biophilia hypothesis, which may have interesting implications for its relationship to both the biological development of empathy, as well as external factors that reportedly enhance its development. In developing the biophilia hypothesis, Wilson (1984) suggested that this "innate interest in nature" assigned a duty to care for nature as well, and noted that biophilia involves a complex part of mental development. The more that individuals come to understand other organisms, the more value that is placed on coming to know the other organism, and one's self in relation to it. As such, this understanding "elevates the very concept of life" for humanity. Thus, an individual's own predisposition to nature (innate), as well as the experience of nature (external), may be what most strongly contributes to the development of empathy.

Summary

There is clearly a strong empirical base supporting both biological aspects of empathy and environmental and demographic aspects. Duan and Hill (1996) distinguished between two areas of empathy literature, namely empathy with respect to

individual differences, and general predictors of empathy. Interestingly, they observed that there is a lack of attention to similarities among individuals which are generalizable to all facets of empathy research. While the focus on individual differences may compromise the exploration of cause-effect relationships between empathy and its predictors, that some individuals are more empathic than others has been a guiding force in empathy research. Similarly, Jenkins et al. (1992) speculated that certain personal perceptions, attitudes, and beliefs might have some effect on its development. Clearly, an investigation of general variables that predict empathy is warranted. As seen throughout this review of literature, the variables that appear to contribute to empathy, debatable or not, can be assigned to three different groups.

Researchers (Zahn-Waxler and Radke-Yarrow, 1990) have suggested that there are stable, individual differences in empathy and that both biological and experiential factors contribute to its development. Further, both nature and nurture are likely to contribute to the development of empathy, in contrast to the traditionally held research pattern of examining empathy in the context of moral development. While there is a tendency to emphasize in research universal processes more than individual differences, it is likely that both temperament and environment contribute to the development of empathy. As discussed in the review of literature, a biological case for the development of empathy is evident, at least in its initial stages. Hoffman (1981) pointed to newborn babies' tendency toward reactive crying as a sign of empathic distress, whereas other researchers (Plutchik, 1987; Thompson, 1987) have pointed to empathy in animals as proof of an evolutionary basis for caring behaviours. Further support for this was offered by Eisler and Levine (2002), who pointed to the evolutionary function of caring

behaviours as evidenced by the survival of babies in mammals as a function of care. A number of questions have also been raised related to the varying degrees to which individual empathy is influenced by external factors. For instance, Zahn-Waxler and Radke-Yarrow (1990) questioned the composition of a child who fails to develop compassion, even under ideal environmental circumstances. They also questioned when a disruption in empathy became an indicator of certain psychopathologies. These ultimately led to speculation that there may be conditions of development, temperament, family life, and so on, that influence the way in which empathy develops, and is expressed in balance, in different individuals.

The arguments for biological and external influences are mutually persuasive, especially when regarding the explanations for each as providing a complementary role that ultimately advance the combined impact of both notions as a whole. As such, the most compelling argument may lie in a unifying theory which embraces the general claim for empathy as an aspect of “nature,” and the contention that empathy is a product of “nurture.” Biophilia may offer such a unifying framework, especially in view of the importance of relationships with animals. Thus, the biophilia hypothesis may have important implications not only for its relationship to both the biological and environmental determinants of empathy, but for its mediating ability to bring coherence to the two. While the evidence for a growth in empathy is often linked to animals, the question remains as to whether it is being mediated by attachment, attitudes, pet presence, or simply an interest in animals. It may be that additional factors, other than only pet-related variables, contribute to the development of empathy, and that it is a combination of such that mediates empathy and prosocial behaviour.

Variable Clusters

Clark (1980) espoused that the nature of empathy is to intervene and balance egocentricity and gratification with concern for others, and that it is imperative that determinants of empathy be identified for research purposes. Empathy has been viewed as influenced by situational, personality, developmental, and motivational factors (Karem, Fishman & Josselson, 2001). Accordingly, the focus of the present research was to determine which variables predict empathy, either isolated or combined. As discussed throughout the literature review, there are a number of factors that influence, or contribute to, the development of empathy. Based on this review, the variables that contribute to empathy development can be assigned to three clustered groups. They are (1) Dispositional, (2) Situational, and (3) Biophilial.

Dispositional Cluster. This cluster refers to the variables discussed in the review of literature indicating that empathy is comprised of innate variables related to behaviour, personality, and mental health. Earlier in the review of literature, it was noted that such things as personality disorders and narcissism are related to reduced empathy (Zahn-Waxler & Radke-Yarrow, 1990), as is antisocial behavior (Ellis, 1982; Koestner, Franz, & Weinberger, 1990; Zahn-Waxler & Radke-Yarrow, 1990). Further, there is a consistently negative correlation between empathy and aggressive behaviour (Feshbach & Feshbach, 1969; Mehrabian & Epstein, 1972; Miller & Eisenberg, 1988; Richardson et al., 1994). Other behavioural conditions that were negatively correlated to empathy for adolescents included attention deficit-hyperactivity disorder (ADHD) (Braaten & Rosen, 2000), an inclination toward sexual offenses (Burke, 2001), and delinquent behaviour (Kaplan & Arbuthnot, 1985). Aspects of personality were also correlated with empathy.

Individuals with high scores on the Thinking-Feeling scale of the Myers-Briggs Type Indicator also demonstrated high empathy (Jenkins, Stephens, Chew, & Downs, 1992).

As supported throughout the literature review, it has been suggested that individuals who exhibit aggressive or antisocial behaviour are likely to exhibit lower empathy than those who do not. Further, certain personality traits also appear to influence empathic development. Consequently, the variables that comprise this particular psychological cluster and have a basis in the literature are linked to behaviour and personality traits. Therefore, this cluster will be developed using measures of personality and aggression.

Situational Cluster. These variables relate to the literature base that examines various external and demographic factors, such as parenting and sex, that have reportedly been linked to empathic development. One consistent demographic factor is that females are consistently found to be more empathic than males (Barnett et al., 1980; Jenkins, Stephens, Chew, & Downs, 1992; Kaplan & Arbuthnot, 1985; Koestner, Franz, & Weinberger, 1990; Lopez, Bonenberger & Schneider, 2001; Paul, 2000), although Karniol et al. (1998) found that gender role orientation, not necessarily gender, could predict empathy. Age was another variable that correlated with empathy, especially in childhood. Developmental changes are typically marked by an increase in empathy in children (Feshbach & Feshbach, 1969; Koestner, Franz, & Weinberger, 1990; Miller & Eisenberg, 1988) and adolescents (Ellis, 1982). However, in several instances, higher chronological age actually predicted lower empathy (Pennington & Pierce, 1985; Royse, Dhooper, & Hatch, 1987). Abraham, Kuehl, & Christopherson (1983) found that the child's age and parental influence impacted empathic development. In fact, and not

surprisingly, a particularly strong predictor appears to be parenting experiences of children. Children who have been abused by parents, or who had parents with low empathy, tend to exhibit low empathy (Miller & Eisenberg, 1988). Conversely, supportive parenting is positively correlated with empathy (Barnett, 1987; Zahn-Waxler et al., 1979). While overall parental support was significant, paternal involvement was a unique contributing factor in one particular study (Koestner, Franz, & Weinberger, 1990).

Grade point average was also shown to be positively correlated with empathy (Jenkins, Stephens, Chew, & Downs, 1992). It has also been suggested that cultural influences, such as religion and domesticity are contributing factors (Grier, 1999). Further, while much of the literature points to demographic variables in childhood, marital status and child-rearing experiences were also shown to influence adults (Paul, 2000).

Variables that can be clustered as Situational include gender, age, and parenting. There may also be other contributing factors that are alluded to, though not specifically addressed, in the review of literature. These may include such things as parental marital status, current marital status, and cultural background. The variables contained within this Situational cluster will be measured with a demographic questionnaire and a measure of parenting styles.

Biophilial Cluster. This cluster is a composition of pet-related variables. Whether or not pets actually affect or generate empathy in individuals, there is certainly a belief that they do. In fact, it is not uncommon for parents to obtain pets for their children because they believe that they will have a positive influence on the children (Fifield & Forsyth, 1999; Grier, 1999). Further, many researchers have theorized that pets have a

positive impact on the general emotional and prosocial development and well-being of children (Davis & Juhasz, 1985; Levinson; Robin & ten Benseel, 1985). Empirical studies document this further (Siegel, 1995; Van Houtte & Jarvis, 1995). More specifically, there is a strong case, based on empirical research, for the important effects that pets can have on the development of empathy in children. Hergovich et al. (2002) reported that the presence of a dog in a classroom over a 3-month period increased empathy in the experimental group of 6- and 7-year old schoolchildren. Kidd and Kidd (1990) found that high school students who had pets also experienced higher empathy than those without pets, although the quality of the relationship between the subjects and their pets was not reported. Thus, the variables that comprise this biophilial cluster include pet attitude, pet preference, and history of relationships with pets.

The Questionnaire Measure of Emotional Empathy (QMEE)

In a seminal article leading to the development of a measure of empathy, Mehrabian and Epstein (1972) pointed to the two distinct views in the literature regarding empathy. The first is a cognitive view, based on Dymond's (1949) role-taking approach. From this perspective, an empathic person assumes another's role through understanding and predicting the other's actions, feelings, and thoughts. In this view, empathy is defined as *predictive accuracy*. The second view is that empathy is affective, a vicarious emotional response to the perception of another person. It was pointed out that the critical difference between these two views is that the cognitive view is a recognition of feelings, while the latter affective view includes a sharing of feelings. Early empathy measures favoured the former view, differentiating between levels of cognitive insight. However, instruments measuring emotional response relied on self-report and physiological indicators, and lacked consistency among them. They did not differentiate between different types of emotional experience, nor were various physiological indicators of the same emotion correlated.

With these considerations in mind, Mehrabian and Epstein (1972) sought to develop a measure of emotional empathy, as distinct from predictive accuracy and to test its validity in two different settings: one related to aggression and the other to helping behaviour. It was hypothesized that an individual is more likely to engage in helping behaviour when another person's distress is observed. The 30-items on the questionnaire were selected based on insignificant correlations with the Crowne and Marlow (1960) social desirability scale, significant .01 level correlations with the scale's total score, and the content validity inferred from factor analyses of a larger pool of items.

The first two experiments (Section 1) were designed to test the immediacy-nonaggression hypothesis and the empathy-nonaggression hypothesis. Literature was cited (Feshbach, 1964; Milgram, 1965) supporting the immediacy-nonaggression hypothesis that a person is discouraged from using aggressive behaviour for nonaggressive goals, based on the immediacy and pain intensity of the victim. The empathy-nonaggression hypothesis suggests that individuals who are higher in empathy are less aggressive than low empathy persons. Both hypotheses were included in examining whether a decrease in aggression in an immediate feedback condition was greater for high-empathy individuals.

The two conditions of Experiment 1 were conducted one week apart. For the first condition, the empathy questionnaire was administered to groups of ten of the 88 participating psychology students (M=37, F=51), as three subjects were removed due to familiarity with Milgram's (1965) similar experiment. Upon completing the questionnaire, the subjects were recruited for the second condition one week later, which they were told was on "personality and learning." For the second condition, same sexes were randomly chosen to act as the "teacher" (subject) and paired with a confederate who acted as "student" who was to make predictions about a third person, based on a character sketch that the confederate supposedly read. The subject was given an answer key and was instructed to punish the confederate with a shock each time a wrong answer was produced. In reality, the confederate answered according to a predetermined schedule, providing only 15 correct answers of 30 questions. The subject, who had experienced the shocks prior to the intervention, could administer shocks of seven intensity levels. While the subject believed the shocks to be administered, in reality the confederate received no

shock. Nevertheless, the confederate was aware of the level of shock the subject was supposedly giving and reacted with appropriate pain cues. In the immediate condition, the confederate was seated closely to the subject, in full view. In the nonimmediate conditions, the confederate was out of view in another room but could still be heard by the subject.

An overall aggression score, based on the average level of administered shocks, was computed. A stepwise multiple regression explored the main and interactive effects of empathic tendency, the immediate and removed levels of immediacy, and the sex of the subject. A significant correlation was reported between empathy and sex, a finding that was not significant in a replication study of 104 subjects ($M=47$, $F=47$). The mean aggression of males (2.55) was also significantly higher than females (2.06). These results indicated that while empathy itself did not inhibit aggression, there were empathic differences when combined with differences in the victims' immediacy. Individuals who were low in empathy aggressed equally against immediate (2.43) and nonimmediate (2.35) victims, whereas those high in empathy aggressed less when the victim was immediate (1.77) as opposed to nonimmediate (2.57).

The second experiment (Experiment 2) emerged mainly from research by Krebs (1970), which examined personality correlates and determiners of altruistic behaviour. It was determined that subjects are more likely to help someone they like, who was similar to themselves, and who was dependent. Krebs' (1970) also noted that studies utilizing behavioural measures were less likely to yield significant results than those using parent-, peer-, or self-ratings of altruistic behaviour. Mehrabian and Epstein (1972) noted the lack of significance, in empathy literature, between personality measures and helping

behaviours, a primary motive for the current experiment, which was to examine the combination of personality and situational factors as they contribute to helping behaviour.

It was hypothesized that altruistic behaviour would emerge as a correlate of both empathic tendency and of similarity with an individual requiring help. The independent variables of emotional empathic tendency, succorance (dependence), affiliative tendency, sensitivity to rejection, and approval-seeking tendency were examined with respect to the amount of time offered to help an experimental confederate. The subjects were all female undergraduates (N=79). They first rated their attitudes on a nine-point continuum which included 11 topics ranging from controversial (e.g. Vietnam war) to mundane (e.g. preference for leisure activities) issues. They also began a second set of questionnaires which included instruments related to emotional empathic tendency, succorance, and approval-seeking tendency, as well as a semantic differential questionnaire measuring characteristic emotions related to the three feeling factors of pleasure, arousal, and dominance.

While each subject worked on the personality instrument task, the experimenter created a bogus questionnaire that supposedly represented similar or dissimilar attitudes of another subject (the confederate). After 20 minutes, the experimenter returned and asked the subject to listen to music with another person, who was one of the five confederates trained for the purpose of the study. The confederate's bogus questionnaire was given to the subject, who was told that the confederate would be studying hers. They were told to report their own reactions to the music, then switch attitudinal surveys to predict the other's reaction based on her survey. During the time together, the confederate never looked at the subject and stared at the floor 50% of the time. When the

experimenter left the room for a three-minute duration, the confederate feigned emotional upset regarding a problem, and asked the subject, as scripted, for help on an upcoming experiment. When the experimenter returned, the subject was informed that no music would be played after all. She was asked, once alone, to report her liking of, and perceived similarity to, her partner.

Five separate stepwise multiple regression analyses explored the main and interactive effects of similarity-dissimilarity on helping behaviours, which was comprised of the following five independent variables: empathic tendency, affiliative tendency, sensitivity to rejection, succorance, and approval seeking tendency. Amount of time was the dependent variable. There was only one .05 significant effect showing that helping behaviour was a function of the independent variable of empathic tendency ($\beta = 0.31$). There was no relationship between helping behaviour and the liking of the confederate, or of one's perceived similarity to the confederate. The only other significant relationship was between perceived similarity and liking ($r = 0.39$). Further, with respect to the subjects' ratings of their characteristic emotions on three dimensions of emotion (pleasure, arousal, and dominance), only arousal ($\beta = .33$) was significant ($p < .05$).

The manipulation was deemed effective because the subjects' perceived similarity was related to the manipulated similarity, although the similarity manipulation did not induce differences in liking and helping behaviour. It was also pointed out that the insignificant correlation between subjects' liking of the other and the amount of help offered is consistent with earlier research suggesting that attractiveness is not a mediator of altruism, as suggested by Krebs (1970). The researchers reported that the present

findings were encouraging as support for the notion that emotional empathy is a key personality attribute in predicting helping behavior.

Overall, the researchers (Mehrabian & Epstein, 1972) reported that the instrument was highly reliable and showed discriminant validity. Further, the scale was valid in distinct settings. The researchers made a case for the use of this instrument in other groups, particularly those in the helping professions.

METHOD

CHAPTER III

Research Design

It is evident from the reviewed literature that while empathy has biological roots in children and adolescents, there are clearly distinct external variables that seem to impact its development across the lifespan. Furthermore, individuals' attitudes toward, and relationships with, pets appears to impact empathy, although the correlation is ambiguous. Whether this effect is distinctly related to the nature of the human-animal relationship or whether the addition of other variables combine to have a positive effect is unclear from the current research literature, which has yielded inconsistent results. Therefore, one aim of this study was to address the issue of correlates of empathy. Variables which may characterize more empathic individuals are clustered into the groups, as discussed above, of Dispositional, Situational, and Biophilial.

Correlational analyses and multiple regression analyses were performed to determine which variables were related to empathy. The predictor variables were those previously discussed, as they fell into clusters related to Dispositional (psychological and behavioural), Situational (demographics and environmental influences) and Biophilial (pet preferences, attitudes and history). Specifically, the predictor variables were aggressive behaviour, personality, parental discipline history, demographics, attitudes toward animals, pet history, and pet preference.

Research Questions and Hypotheses

The general research questions concerned the profile of high empathy individuals with respect to Dispositional variables, Situational variables, and Biophilia variables.

1) The first research question generated the hypotheses that higher empathy individuals would demonstrate the following profile:

A) With respect to Dispositional variables, they will emerge as:

- i. Non-aggressive;
- b. Higher in the sympathy factor of personality;

B) With respect to Situational variables, they will emerge as:

- i. Older;
- ii. Female;
- iii. Having experienced more humanistic than strict discipline during childhood;

C) With respect to Biophilial variables, they will emerge as:

- i. Having a history of pet ownership;
- ii. Having a positive attitude toward pets;
- iii. Having a preference for dogs over other pets;

2) The second research question addressed model-building. When discriminating variables are combined and examined in a stepwise multiple regression analysis, the relative importance of each variable will be evident. It was predicted, as a working hypothesis, that the variables contained in the Situational cluster would be more prominent predictors than those within the Dispositional or Biophilial clusters.

Participants

Mehrabian and Epstein (1972) suggested that emotional empathy predicts helping behaviour, and leads individuals into careers in the helping professions. As such, their measure of emotional empathy, which is both reliable and valid, would seem appropriate for such populations as educators, who fall into the realm of “helping professionals.” Accordingly, empathy is an important construct for individuals in the helping profession, such as those in the medical, psychotherapy, and educational professions. Erera (1997) advanced that enhancing empathy within therapeutic settings, among therapists, can contribute to an understanding of client needs. Transposed to educational settings, this would equate to an understanding of students’ needs. Hence, a population of preservice teachers was a logical population to investigate. Given the number of variables in the study, a large sample was sought and 448 individuals completed the instruments (M=144, F=304). The available population from which subjects were drawn was approximately 700 teacher candidates enrolled in a one-year Bachelor of Education program in a southwestern Ontario university. Of the current sample, 242 were studying to teach elementary students in the primary and junior grades (K-6), 120 were studying to teach students in junior and intermediate grades (4-10), and 86 were studying to teach intermediate and senior students (6-12).

Measures

The Aggression Questionnaire (Buss & Perry, 1992) (modified) (Appendix A1).

The original Aggression Questionnaire (Buss & Perry, 1992) is a 29-item self-report

questionnaire. It measures four subtraits of aggression: Physical Aggression, Verbal Aggression, Anger, and Hostility. However, the present scale was a modified version in accordance with recommendations for improving the measure psychometrically and increasing its validity. Harris (1995) attempted to cross validate the scale's structure using an independent sample. Because two of the eight Hostility items had relatively lower loadings than did other items, they were omitted. Meesters et al. (1996) confirmed that the removal of these two items improved the instrument, and further recommended omitting a third item from the Verbal Aggression factor.

Accordingly, these three items were omitted from the present scale. Subjects were therefore asked to rate each of the 26 items on a scale from 1 ("extremely uncharacteristic of me") to 5 ("extremely characteristic of me"). Reliability of the original instrument was reported (test-retest) as follows: Physical Aggression; .80; Verbal Aggression, .75; Anger, .72; and Hostility (.72). The total score was .80 (Buss & Perry, 1992). For the revised index, test-retest correlations were similar (.76 for Physical Aggression, .78 for Verbal Aggression, .79 for Anger, and .77 for Hostility). Again, the total score was .80.

Demographic History Questionnaire (Appendix A2). This questionnaire was designed to gather information regarding the current status of participants. Subjects were asked to describe their current demographic status with respect to such items as marital status, number of children, education background, sex, age, and current income. They were also asked to provide information related to their childhood demographic status, such as number of siblings, parental marital status, and perceived economic status.

Discipline History (Appendix A3). The purpose of this questionnaire, designed for this study, was to gather information pertaining to the individuals' history of

discipline while being raised. Respondents answered 11 questions according to a five-point scale ranging from “Strongly agree” to “Strongly disagree.” A factor analysis was run on the 11 items using an eigenvalue of 1, varimax rotation, and a loading criterion of .3 with a requirement that at least two items load on a factor. Two factors emerged. The first factor was termed “Humanistic Discipline” (seven items) and accounted for 42.1% of the variance. Sample items on this scale were “When I misbehaved, parents talked to me about my behaviour” and “I was disciplined fairly.” The second factor was termed “Strict Discipline” (four items) and accounted for 17.53% of the variance. Sample items on this scale were “My parents were very strict” and “When I misbehaved, I was physically disciplined.”

Pet Attitude Scale (PAS) (Templer, Salter, Dickey, Baldwin, & Veleber, 1981) (Appendix A4). The Templer Pet Attitude Scale (PAS) measures the favorableness of attitudes toward pets. The 18-items on the questionnaire are related to three factors: love and interaction, pets in the home, and joy of pet ownership. While the original instrument contained a 7-point Likert scale, the present measure was modified to a 5-point scale, ranging from “strongly agree” to “strongly disagree.” Reliability was reported with a Cronbach’s Alpha coefficient of .93 ($p < .001$). Test-retest reliability was .92. Further, kennel workers had significantly higher scores than social work students in the initial development, indicating criterion-oriented validity and face validity. The researchers determined the instrument to be stable and internally consistent.

For the present investigation, a factor analysis was run on the 18 items in the Pet Attitude Survey using an eigenvalue of 1, varimax rotation, and a loading criterion of .3 with at least two items loading on a factor. Three factors emerged. The first factor was

termed “Lovers of Pets” (13 items) and accounted for 48.13% of the variance. Sample items on this scale were “I love pets” and “I would like to have a pet in my home.” The second factor was termed “Avoider of Pets (12 items) and accounted for 8.43% of the variance. Sample items on this scale were “Pets are fun but it’s not worth the trouble of owning one” and “I hate pets.” The third factor was termed “Humanizer of Pets” (5 items) and accounted for 5.94% of the variance. Sample items on this scale were “I have occasionally communicated with a pet and understood what it was trying to express” and “You should treat your housepets with as much respect as you would a human member of your family.”

Pet Ownership & History (Appendix A5). Participants were asked to provide information pertaining to their childhood related to their pet-ownership status, as well as to their parents’ marital status. They were also asked to indicate the number of siblings with which they were raised. With respect to pets, the instrument is designed to determine the type of relationship the individual had with the pet, as well as how responsible the individual was for the pet’s care.

The Pet Preference Inventory (Daly, 2003) (Appendix A6). The Pet Preference Inventory was developed for use in a study of empathic differences among children in grades four, six, and eight (Daly & Morton, 2003). However, it is appropriate for adult populations. Subjects were asked to rank their preference for five different pets. They were given the choice of cat, horse, fish, dog, or bird. They indicated their preference on a 5-point Likert scale ranging from “I would love to have this pet” (5) to “I wouldn’t like to have this pet at all” (1).

The Questionnaire Measure of Emotional Empathy (QMEE) (Mehrebian & Epstein, 1972) (Appendix A7). The Questionnaire Measure of Emotional Empathy (QMEE) has been extensively used to assess empathy (Schonert-Reichl, 1993). It is also the most frequently used empathy measure for older adolescents and adults (Miller & Eisenberg, 1988). The QMEE is a 33-item self-report measure, the possible total score for which ranges from -132 to +132. The split-half reliability is reported as .84. The authors of the QMEE report a seven factor structure for the scale, which are as follows: “Susceptibility to Emotional Contagion,” “Appreciation of the Feelings of Unfamiliar and Distant Others,” “Extreme Emotional Responsiveness,” “Tendency to Be Moved By Others’ Positive Emotional Experiences,” “Tendency to Be Moved by Others’ Negative Emotional Experiences,” “Sympathetic Tendency,” and “Willingness To Be in Contact with Others Who Have Problems.” However, it is not clear which items load on each scale. Moreover, it may be the case that a different population would respond in such a way that a different factor structure would emerge. Thus this factor structure is somewhat tenuous. According to the authors, validity studies show that subjects with

higher empathy display more helping behaviours and less aggression than those with lower scores.

SONSO Personality Inventory (Kentle, 1994) (Appendix A8). The SONSO Personality Inventory (SPI) (Kentle, 1994) was derived from factor analyses of the “Big Five” model of personality which include Conscientiousness, Agreeableness, Openness (Culture), Introversion, and Neuroticism. It was determined that Openness, Conscientiousness, and Agreeableness contained essential characteristics based on the common meaning of the adjectives of highest loading for each of the three. Introversion and Neuroticism were comprised of specific elements that appeared to have differed from their essential definitions. In revising the original five factors, the SPI measures five personality factors based on similar factor loadings as original “Big Five” factors. These factors are Shyness, Organization, Nervousness, Sympathy, and Originality. Subjects rate themselves on a self-report 5-point Likert scale comprised of 50 adjectives. Answers vary from “strongly describes me (5) to “doesn’t describe me at all” (1).

Procedure

After obtaining clearance from the Research Ethics Board (REB, University of Windsor), students from the Faculty of Education, University of Windsor, were recruited from large Educational Psychology classes. These classes are comprised of students from primary, junior, intermediate, and senior levels. Although this was a convenience sample, it was appropriate because of the relevance and importance of learning about empathy for future teachers. Students were asked to complete the instruments that have been described in the previous section and were assured of confidentiality. Furthermore,

they were assured that their participation was voluntary, and that they could withdraw consent at any time throughout the data collection process.

An investigation was undertaken to examine whether there exists differences between high- and low-empathy individuals with respect to specific predictor variables which comprise Dispositional, Situational, or Biophilial clusters. Each of the three clusters was comprised of different variables, which are as follows:

Dispositional Cluster. This cluster was comprised of the variables which were measured by the SONSO Personality Inventory (Kentle, 1994) and the Aggression Questionnaire (Buss & Perry, 1992). Thus, the variables for this cluster were: Sympathy, Originality, Nervousness, Shyness, and Organization (SONSO); and Verbal Aggression and Physical Aggression (the Aggression Questionnaire).

Situational Cluster. The variables which comprised this cluster were derived from the Demographic History questionnaire, the Discipline History questionnaire, and the Pet Ownership and History questionnaire. With respect to the Discipline History, the items on the scale which emerged from the factor analysis were categorized as either “Humanistic Discipline” or “Strict Discipline.”

Biophilial Cluster. This cluster was comprised of the Pet Preference Inventory (Daly & Morton, 2003) and the Pet Attitude Scale (PAS) (Templer, Salter, Dickey, Baldwin, & Veleber, 1981).

CHAPTER IV

RESULTS

Correlational Analyses: QMEE Total

Dispositional Cluster. As may be seen in Table 1, Sympathy ($r = .49$) emerges as the strongest psychological correlate with the total empathy score. Nervousness ($r = .16$) and Originality ($r = .13$) are also correlated with a total empathy score. In effect, people scoring higher in empathy also score higher in Sympathy, Nervousness, and Originality, as measured by the SONSO subscales. Physical Aggression ($r = -.18$) appears to be negatively correlated to empathy. This would indicate that people who are higher in empathy show lower physical aggression scores.

Situational Cluster. As Table 2 illustrates, the strongest demographic variable correlated with empathy is Sex ($r = .45$). Females show the higher empathy scores. Two other variables which negatively correlate with empathy are Age ($r = -.12$) and Education ($r = -.10$), although they are not strongly related. Surprisingly, as age and education increase, empathy decreases.

Biophilia Cluster. Table 3 is comprised of biophilic variables that are both specific (e.g., "Would Love a Horse," "Would Love a Dog") and general (e.g., "Lovers of Pets," "Avoiders of Pets," "Humanizer of Pets"). The strongest correlate is the general measure of "Lovers of Pets" ($r = .26$). Thus, individuals who self-reported to be "Lovers of Pets" are also higher in empathy. Three specific variables are also correlated, "Would Love a Dog" ($r = .26$), "Would Love a Horse" ($r = .24$) and "Would Love a Cat" ($r = .20$). The general measure of "Avoiders of Pets" ($r = -.22$) correlates negatively with empathy.

Thus, those with more negative feelings (e.g., pets cause “a lot of damage to your furniture” and are “not worth the trouble of owning”) show lower empathy scores.

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Table 1
Pearson Product Moment Correlation Coefficients for the QMEE Total Score and the Nine Variables in the Dispositional Cluster

Scale	1	2	3	4	5	6	7	8	9	10
1. QMEE Total	1	-.02	.05	.16**	.50**	.13**	-.18**	-.06	.01	.00
2. SONSO Shyness	-.02	1	.03	.46**	.03	-.20**	-.04	.11**	.04	.30**
3. SONSO Organization	.05	.03	1	-.01	.24**	.06	-.14**	-.12*	-.10*	-.08
4. SONSO Nervousness	.16**	.46**	-.01	1	-.09	.00	.19**	.23**	.32**	.51**
5. SONSO Sympathy	.49**	.03	.24**	-.09	1	.16**	-.26**	-.17**	-.12*	-.10*
6. SONSO Originality	.13*	-.20**	.06	.00	.16**	1	.08	.20**	.07	-.06
7. Physical Aggression	-.18**	-.04	-.14**	.19**	-.26**	.08	1	.48**	.54**	.45**
8. Verbal Aggression	-.06	-.11**	-.12*	.23*	-.17**	.20**	.48**	1	.53**	.38**
9. Anger	.01	.04	-.10*	.32**	-.12*	.07	.54**	.53**	1	.53**
10. Hostility	.00	.29**	-.08	.51**	-.10*	-.06	.45**	.38**	.53**	1

* $p < .05$

** $p < .01$

Table 2
 Pearson Product Moment Correlation Coefficients for the QMEE Total Score and the Nine Variables in the Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. QMEE	1	.45**	-.12*	-.10*	-.04	.01	-.04	-.06	-.02	-.02	.05	-.03	-.09
2. Sex	.45**	1	-.13**	-.06	-.02	.06	.06	-.05	-.02	-.02	.03	.00	-.04
3. Age	-.12*	-.13**	1	.38**	.35	.03	.19**	.21**	.19**	-.14**	-.17**	-.08	-.03
4. Education	-.10*	-.06	.38**	1	.16**	.01	.07	.04	.06	-.08	-.08	-.03	-.07
5. Children < 18	-.04	-.02	.35**	.16**	1	.10*	.23**	.08	.10*	.07	-.09	-.04	-.05
6. Income	.01	.06	.03	.01	.10*	1	.00	-.11*	-.08	-.05	.03	-.04	-.06
7. Siblings (growing up)	-.04	.06	.19**	.07	.23*	.00	1	.09	.03	-.07	-.02	.01	-.01
8. Perceived Fin. Status	-.06	-.05	.21**	.04	.08	-.11*	.09	1	.31**	-.02	-.10**	.03	.29**
9. Humanistic Disc.	-.02	-.02	.19**	.06	.10*	-.08	.03	.31**	1	.00	.08	.05	.03
10. Strict Discipline	-.02	-.02	-.14**	-.08	-.07	-.05	-.07	-.02	.00	1	.08	.03	.11*
11. Always lived w/ pets	.05	.03	-.17**	-.08	-.09	.03	-.02	-.10*	-.08	-.08	1	-.03	.01
12. Grew up with pets	-.03	.00	-.08	-.03	-.04	.04	.01	.03	-.08	.08	-.03	1	.05
13. Parents' mar. status	.09	-.04	-.03	-.07	-.05	-.06	-.01	.28**	.03	.11*	.01	.05	1

** $p < .05$

** $p < .01$

Table 3
Pearson Product Moment Correlation Coefficients for the QMEE Total Score and the Eight Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. QMEE	1	.20**	.24**	.03	.26**	.26**	-.22**	.16**
2. PP1 - Would Love a Cat	.20**	1	.23**	.17**	.10*	.32**	-.17**	.15**
3. PP2 - Would Love a Horse	.24**	.23**	1	.25**	.31**	.32**	-.05	.12*
4. PP3 - Would Love a Fish	.03	.17**	.25**	1	.15**	.09	-.08	.05
5. PP4 - Would Love a Dog	.26*	.10*	.31*	.15**	1	.51**	-.44**	.10*
6. PAS - Lovers of Pets	.26**	.32**	.32**	.09	.51**	1	.01	.00
7. PAS - Avoiders of Pets	-.22**	-.17**	-.05	-.08	.44**	.01	1	.00
8. PAS - Humanizers of Pets	.16**	.15**	.12&	.05	.10*	.00	.00	1

* $p < .05$

** $p < .01$

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Correlational Analyses: Aspects of Empathy

The QMEE total score is used in the majority of the research studies that utilized the QMEE (Barnett et al., 1980; Bohlmeier, Burke, & Helmstadter, 1986; Gawronski & Privette, 1997; Kim & Rohner, 2003; Paul, 2000; Sandoval, Hancock, Poythress, Edens, & Lilienfeld, 2000, etc.). Further, an exhaustive search has found no authors who have reported using the original seven subscales noted by Mehrabian and Epstein (1972). In fact, because the original authors (Mehrabian & Epstein, 1972) did not specify the questions that comprised each scale, Dillard and Hunter (1989) attempted to have a group of professors and graduate students assign the items to their corresponding classifications. Because they came to agreement on only three of the 19 unassigned questions, they decided that these subscales would be rejected. Their own exploratory factor analysis yielded four different factors: Humanistic Orientation, Considerateness, Fictional Involvement, and Emotional Contagion. Kalliopuska (1994) reported that in two different studies by the same author (Kalliopuska, 1983, 1994), only five factors and six factors, respectively, were extracted when using the QMEE. The factors reported for the later study (Kalliopuska, 1994) were Emotional Receptiveness, Tendermindedness-Toughmindedness, Showing Feelings and Temporal Identification, Emotional Control and Broader Self-Control, and Emotionality: The Rejection of Emotions. Given the various factor configurations from different studies, perhaps due in part to the different populations investigated, there is clearly a case for exploring the factor structure of the QMEE in more detail.

While the correlations with the total empathy score (QMEE) are interesting, the factor structure would allow for a much closer examination of empathy, even if only

exploratory. Thus, for the current study, a confirmatory factor analysis using an eigenvalue of 1, varimax rotation, and a loading criterion of .30, was run. This yielded ten unique factors related to different aspects of empathy. Since six subscales could be constructed based on the factor analysis scores which did give reliabilities above .6, it was possible to examine six aspects, or components, of empathy. The scales were termed: (1) the Literary Aspect which accounted for 16.04% of the variance ($\alpha = .68$) (sample items were “Sometimes the words of a love song can move me deeply” and “Becoming involved in books or movies is a little silly”), (2) the Interpersonal Aspect which accounted for 7.93% of the variance ($\alpha = .64$) (sample items were “I become nervous if others around me seem to be nervous” and “The people around me have a great influence on my moods”), (3) the Susceptible Aspect which accounted for 5.96% of the variance ($\alpha = .67$) (sample items were “I find it silly for people to cry out of happiness” and “Another’s laughter is not catching for me”), (4) the Controlled Aspect which accounted for 4.42% of the variance ($\alpha = .62$) (sample items were “I tend to get emotionally involved with a friend’s problems” and “I often find that I can remain cool in spite of the excitement around me”), (5) the Compassionate Aspect which accounted for 4.17% of the variance ($\alpha = .64$) (sample items were “It makes me sad to see a lonely stranger in a group” and “I get very angry when I see someone being ill-treated”), and (6) the Animal Aspect which accounted for 3.5% of the variance ($\alpha = .66$) (sample items were “People make too much of the feelings and sensitivity of animals” and “I am very upset when I see an animal in pain.”)

Correlational analyses were run for each of the six aspects of empathy for the three clusters of variables (Dispositional, Situational, and Biophilial). The coefficients are presented in Table form in Appendix A.

For the Dispositional cluster, Sympathy was positively correlated to all six different empathy aspects. The correlations for each were as follows: Literary, $r = .40$, Interpersonal, $r = .16$, Susceptible, $r = .45$, Controlled, $r = .38$, Compassionate, $r = .42$, and Animal, $r = .25$. It correlated most strongly with the Susceptible Aspect and most weakly with the Interpersonal Aspect. Organization positively and equally correlated with the three factors of the Literary Aspect ($r = .10$), the Controlled Aspect ($r = .10$) and the Compassionate Aspect ($r = .10$). Originality was positively correlated with the two factors of the Literary Aspect ($r = .30$) and the Susceptible Aspect ($r = .12$) and was negatively correlated with the Interpersonal Aspect ($r = -.15$). Similarly, Shyness had a positive relationship with the Interpersonal Aspect ($r = .26$) and a negative relationship with the Literary Aspect ($r = -.14$).

The Situational cluster revealed the fewest correlations of the three areas, although Sex was positively correlated with all six empathy factors, as follows: Literary, $r = .29$, Interpersonal, $r = .21$, Susceptible, $r = .35$, Controlled, $r = .44$, Compassionate, $r = .35$, and Animal, $r = .21$. This indicates that females are significantly higher in empathy than males in all areas. The Animal Aspect had the most number of significant correlations. In addition to Sex, the factor "Always Lived With Pets" ($r = .34$) correlated positively with the Animal Aspect. There was a negative relationship, however, between the Animal Aspect and Age ($r = -.12$), as well as the factor "Children Under 18" living in the household ($r = -.18$), indicating that as the number of children below 18 residing in a

household increases, there is a decrease in empathy. “Parents’ Marital Status,” referring to the subjects’ own parents, was negatively correlated to both the Interpersonal Aspect ($r = -.10$) and the Compassionate Aspect ($r = -.14$). In effect, students who reported that they were raised with both parents residing in their household showed higher empathy on the Interpersonal Aspect and the Compassionate Aspect.

For the Biophilial cluster, “Would Love a Horse” was positively correlated to all factors except for the Interpersonal Aspect. The correlations were Compassionate, $r = .23$, Animal, $r = .21$, Controlled, $r = .18$, Susceptible, $r = .17$, and Literary, $r = .15$. Similarly, “Would Love a Cat” was significant for all factors but the Literary Aspect, and were as follows: Animal, $r = .27$, Interpersonal, $r = .16$, Compassionate, $r = .15$, Susceptible, $r = .14$, Controlled, $r = .13$. “Would Love a Dog” was positively correlated to the four factors of the Animal Aspect ($r = .43$), the Susceptible Aspect ($r = .19$), the Literary Aspect ($r = .16$), and the Compassionate Aspect ($r = .14$). All three significant correlations for “Avoiders of Pets” were negative (Animal, $r = -.46$, Controlled, $r = -.25$, and Susceptible, $r = -.14$), indicating that students who have a tendency to avoid, or dislike, pets, are lower in the Susceptible, Literary, and Compassionate Aspects of empathy. The remaining four correlations for “Lovers of Pets” were positive (Animal, $r = .42$, Compassionate, $r = .21$, Literary, $r = .21$, and Susceptible, $r = .19$). Thus, individuals who indicate that they are fond of pets are high in the Animal, Compassionate, Literary, and Susceptible Aspects of empathy.

Multiple Regression Analysis

Total QMEE Score. To examine the predictive power of each cluster, Multiple Regression Analyses were computed for each cluster for the total score of the QMEE,

illustrated in Table 4. For the Situational cluster, using nine predictor variables, the Multiple Regression Analysis was significant, $F(9, 326) = 16.66, p < .001$, with an $R^2 = .315$. For the Situational cluster, using 12 predictor variables, the Multiple Regression Analysis was again significant, $F(12, 349) = 9.24, p < .001$, with an $R^2 = .241$. The Multiple Regression Analysis was also significant for the third cluster, Biophilia, $F(7, 354) = 9.73, p < .001, R^2 = .161$. The significant Betas are noted on the tables.

The Dispositional cluster was the strongest predictor model of empathy ($R^2 = .315$), followed by the Situational cluster ($R^2 = .241$) and the Biophilia cluster ($R^2 = .161$). The strongest predictor variables of the Dispositional model were Sympathy ($\beta = .516$) and Nervousness ($\beta = .220$). Shyness emerged as a negative predictor ($\beta = -.184$) which indicates less shy people are more empathic generally. For the Situational cluster, only Sex predicted empathy ($\beta = .464$), indicating that females are more empathic. Four variables predicted empathy for the Biophilia cluster. "Would Love a Horse" ($\beta = .153$) was the strongest unique variable. For the PAS subscales all three were predictors: "Lover of Pets" ($\beta = .166$), "Humanizer of Pets" ($\beta = .118$), and "Avoider of Pets" ($\beta = -.179$). Avoider of Pets was a negative predictor of empathy for the QMEE total score indicating that those scoring higher on Pet Avoidance were less empathic.

Aspects of Empathy (Factor) Scores. Multiple Regression Analyses were run for each of the three clusters for the six dependent variables comprising the six aspects of empathy. All were significant. F values, R^2 coefficients, and significant Beta coefficients are reported in Tables 5 through 10.

When a Multiple Regression Analysis was run for each of the six factors, the same pattern of predictor clusters emerged for four of them. The Literary Aspect showed

the Dispositional cluster to be the strongest predictor ($R^2 = .258$), followed by the Situational cluster ($R^2 = .113$) and the Biophilia cluster ($R^2 = .065$), as did the Interpersonal Aspect (Dispositional, $R^2 = .229$, Situational, $R^2 = .084$, Biophilia, $R^2 = .057$), the Susceptible Aspect (Dispositional, $R^2 = .244$, Situational, $R^2 = .177$, Biophilia, $R^2 = -.081$), and the Compassionate Aspect (Dispositional, $R^2 = .199$, Situational, $R^2 = .153$, Biophilia, $R^2 = .085$).

The Controlled Aspect and the Animal Aspect revealed a different order for predictors of empathy. With respect to the Controlled Aspect, the Situational cluster was the strongest predictor ($R^2 = .205$), followed by the Dispositional ($R^2 = .191$) and the Biophilia cluster ($R^2 = .100$). The Biophilia cluster was the strongest predictor for the Animal Aspect ($R^2 = .495$), followed by Situational ($R^2 = .203$) and Dispositional ($R^2 = .085$).

The two most consistent predictor variables are Sex (Situational) and Sympathy (Dispositional). Sex (Female) is a positive predictor within each of the six empathy scales (Controlled, $\beta = .436$, Compassionate, $\beta = .362$, Susceptible, $\beta = .349$, Literary, $\beta = .299$, Interpersonal, $\beta = .232$, Animal, $\beta = .212$). Sympathy is also a positive predictor within each of the six empathy scales (Susceptible, $\beta = .503$, Compassionate, $\beta = .434$, Literary, $\beta = .408$, Controlled, $\beta = .388$, Animal, $\beta = .256$, Interpersonal, $\beta = .254$).

For the Dispositional cluster, Shyness negatively predicts three of the six types of empathy. It is a predictor variable for the Controlled Aspect ($\beta = -.213$), the Literary Aspect ($\beta = -.195$), and the Susceptible Aspect ($\beta = -.164$). Since the coefficients are negative, it is the case that people higher on these three aspects of empathy are less shy. Nervousness predicts both the Interpersonal Aspect ($\beta = .312$) and the Literary Aspect (β

= .132). Originality is a positive predictor of the Literary Aspect ($\beta = .153$) and a negative predictor of the Interpersonal Aspect ($\beta = -.161$).

The Situational predictor variables are limited. Parents' marital status appears as a negative predictor of Interpersonal ($\beta = -.148$) and Animal ($\beta = -.123$) aspects of empathy. Age ($\beta = -.121$) is a negative predictor for the Susceptible aspect. A negative variable of the Animal aspect is "Children Under 18" ($\beta = -.139$). Thus, individuals who grew up in two-parent households appear to be higher in the Interpersonal and Animal aspects of Empathy. Further, individuals who have children below the age of 18 residing in the households are lower in the Animal Aspect.

For the Biophilia cluster, "Would Love a Horse" is the most common predictor variable, emerging on three of the factors (Compassionate, $\beta = .176$, Controlled, $\beta = .150$, Susceptible, $\beta = .130$). Only "Lovers of Pets" (Animal, $\beta = .407$, Literary, $\beta = .144$) and "Humanizers of Pets" (Animal, $\beta = .303$, Literary, $\beta = .144$) appear more than once as positive predictors.

Table 4
Regression Analyses of the Total QMEE

		QMEE Total			
Dispositional		Biophilia		Situational	
$R^2 = .315$		$R^2 = .161$		$R^2 = .241$	
$F(9, 326) = 16.66$ $p < .001$		$F(7, 354) = 9.73$ $p < .001$		$F(12, 349) = 9.24$ $p < .001$	
Shyness** ($\beta = -.184$)	6	Would Love a Cat		Sex** ($\beta = .464$)	2
Organization		Would Love a Horse** ($\beta = .153$)		Age	
Nervousness** ($\beta = .220$)	4	Would Like a Dog		Education Level	
Sympathy** ($\beta = .51$)	1	Would Like a Fish		Children under 18	
Originality		Lover of Pets** ($\beta = .166$)	3	Annual Income	
Physical Aggression		Avoider of Pets** ($\beta = -.179$)	5	Siblings Growing Up	
Verbal Aggression		Humanizer of Pets** ($\beta = .118$)		Perceived Financial Status	
Anger				Always Lived with Pets	
Hostility				"Grew up with Pets"	
				Humanistic Discipline	
				Strict Discipline	
				Parent's Marital Status	

Note: Numerals in bold indicate the steps for the Forward Multiple Regression Analysis

* $p < .05$ ** $p < .01$

Table 5
Regression Analyses of the Literary Aspect

		Literary Aspect			
Dispositional		Biophilia		Situational	
$R^2 = .258$		$R^2 = .065$		$R^2 = .113$	
$F(9, 351) = 13.54$ $p < .001$		$F(7, 387) = 3.85$ $p < .001$		$F(12, 383) = 4.07$ $p < .001$	
Shyness** ($\beta = -.195$)	5	Would Love a Cat		Sex** ($\beta = .299$)	3
Organization		Would Love a Horse		Age	
Nervousness* ($\beta = .132$)		Would Love a Fish		Education Level	
Sympathy** ($\beta = .408$)	1	Would Love a Dog		Children in residence	
Originality** ($\beta = .153$)	2	Lovers of Pets* ($\beta = .144$)	4	Annual Income	
Physical Aggression	6	Avoiders of Pets		Siblings Growing Up	
Verbal Aggression		Humanizers of Pets		Perceived financial status	
Anger				Always lived with pets	
Hostility				"Grew up with pets"	
				Humanistic Discipline	
				Strict Discipline	
				Parents' Marital Status	

Note: Numerals in bold indicate the steps for the Forward Multiple Regression Analysis

* $p < .05$ ** $p < .01$

Table 6
Regression Analyses of the Interpersonal Aspect

Interpersonal Aspect						
Dispositional		Biophilia			Situational	
$R^2 = .229$		$R^2 = .057$			$R^2 = .084$	
$F(9, 354) = 11.67$ $p < .001$		$F(7, 391) = 3.41$ $p < .01$			$F(12, 386) = 2.95$ $p < .001$	
Shyness		Would Love a Cat** ($\beta = .147$)			Sex** ($\beta = .232$)	4
Organization		Would Love a Horse			Age	
Nervousness** ($\beta = .312$)	1	Would Love a Fish			Education Level	
Sympathy** ($\beta = .254$)	2	Would Love a Dog			Children in residence	
Originality** ($\beta = -.161$)	3	Lovers of Pets*			Annual Income	
Physical Aggression		Avoiders of Pets			Siblings Growing Up	
Verbal Aggression* ($\beta = -.118$)		Humanizers of Pets** ($\beta = .153$)	5		Perceived financial status	
Anger					Always lived with pets	
Hostility					"Grew up with pets"	
					Humanistic Discipline	
					Strict Discipline	
					Parents' Marital Status** ($\beta = -.148$)	

Note: Numerals in bold indicate the steps for the Forward Multiple Regression Analysis

* $p < .05$ ** $p < .01$

Table 7
Regression Analyses of the Susceptible Aspect

Susceptible Aspect					
Dispositional		Biophilia		Situational	
$R^2 = .244$		$R^2 = .081$		$R^2 = .177$	
$F(9, 338) = 12.13$		$F(7, 369) = 4.68$		$F(12, 363) = 6.52$	
$p < .001$		$p < .001$		$p < .001$	
Shyness** ($\beta = -.164$)	6	Would Love a Cat		Sex** ($\beta = .349$)	2
Organization		Would Love a Horse* ($\beta = .130$)		Age* ($\beta = -.121$)	3
Nervousness		Would Love a Fish		Education Level	
Sympathy** ($\beta = .503$)	1	Would Love a Dog		Children in residence	5
Originality		Lovers of Pets	4	Annual Income	
Physical Aggression		Avoiders of Pets		Siblings Growing Up	
Verbal Aggression		Humanizers of Pets		Perceived financial status	
Anger				Always lived with pets	
Hostility				"Grew up with pets"	
				Humanistic Discipline	
				Strict Discipline	
				Parents' Marital Status	

Note: Numerals in bold indicate the steps for the Forward Multiple Regression Analysis

* $p < .05$ ** $p < .01$

Table 8
Regression Analyses of the Controlled Aspect

		Controlled Aspect			
Dispositional		Biophilia		Situational	
R ² = .191		R ² = .100		R ² = .205	
F(9, 353) = 9.25 p < .001		F(7, 385) = 6.14 p < .001		F(12, 382) = 8.22 p < .001	
Shyness** (β = -.213)		Would Love a Cat		Sex** (β = .436)	1
Organization		Would Love a Horse** (β = .150)		Age	
Nervousness		Would Love a Fish		Education Level	
Sympathy** (β = .388)	2	Would Love a Dog		Children in residence	
Originality		Lovers of Pets		Annual Income	
Physical Aggression* (β = -.122)		Avoiders of Pets** (β = -.231)	3	Siblings Growing Up	
Verbal Aggression		Humanizers of Pets		Perceived financial status	
Anger				Always lived with pets	
Hostility				"Grew up with pets"	
				Humanistic Discipline	
				Strict Discipline	
				Parents' Marital Status	

Note: Numerals in **bold** indicate the steps for the Forward Multiple Regression Analysis

*p < .05 **p < .01

Table 9
Regression Analyses of the Compassionate Aspect

		Compassionate Aspect			
Dispositional		Biophilia		Situational	
$R^2 = .199$		$R^2 = .085$		$R^2 = .153$	
$F(9, 340) = 9.36$ $p < .001$		$F(7, 373) = 4.93$ $p < .001$		$F(12, 367) = 5.53$ $p < .001$	
Shyness		Would Love a Cat		Sex** ($\beta = .362$)	2
Organization		Would Love a Horse** ($\beta = .176$)		Age	
Nervousness		Would Love a Fish		Education Level	
Sympathy** ($\beta = .434$)	1	Would Love a Dog		Children in residence	
Originality		Lovers of Pets*	3	Annual Income	
Physical Aggression		Avoiders of Pets		Siblings Growing Up	
Verbal Aggression		Humanizers of Pets		Perceived financial status	
Anger				Always lived with pets	
Hostility				"Grew up with pets"	
				Humanistic Discipline	
				Strict Discipline	
				Parents' Marital Status* ($\beta = -.123$)	

Note: Numerals in bold indicate the steps for the Forward Multiple Regression Analysis

* $p < .05$ ** $p < .01$

Table 10
Regression Analyses of the Animal Aspect

		Animal Aspect			
Dispositional		Biophilia		Situational	
R ² = .085		R ² = .495		R ² = .203	
F(9, 356) = 3.68		F(7, 393) = 55.12		F(12, 387) = 8.23	
p < .001		p < .001		p < .001	
Shyness		Would Love a Cat		Sex**	
				(β = .212)	
Organization		Would Love a Horse		Age	
Nervousness		Would Love a Fish		Education Level	
Sympathy**	4	Would Love a Dog		Children in residence**	
(β = .256)				(β = -.139)	
Originality		Lovers of Pets**	2	Annual Income	
		(β = .407)			
Physical Aggression		Avoiders of Pets**	1	Siblings Growing Up	
		(β = .470)			
Verbal Aggression		Humanizers of Pets**	3	Perceived financial status	
		(β = .303)			
Anger				Always lived with pets**	5
				(β = .330)	
Hostility				"Grew up with pets"	
				Humanistic Discipline	
				Strict Discipline	
				Parents' Marital Status	

Note: Numerals in bold indicate the steps for the Forward Multiple Regression Analysis

*p < .05 **p < .01

Forward Multiple Regression

To obtain a richer picture of the comparison between the three models, Forward Multiple Regression Analyses were computed with the three clusters combined. The variables selected for inclusion were based on the significant Beta scores in the regression analyses. The order of variables extracted is noted in Tables four through 10 where the models range from three to six for the various aspects of empathy. A six-step model was evident for the QMEE Total, the Literary Aspect, and the Susceptible Aspect. A five-step model was evident for the Interpersonal Aspect and the Animal Aspect. The Controlled Aspect and the Compassionate Aspect revealed a three-step model.

Regression Tables are reported in Appendix C, whereas relevant variables in the regression analyses may be seen in Figure 1. It appears that the Dispositional cluster is most dominant but all three clusters are relevant in building a model of empathy prediction. In the Situational cluster, Sex is the prominent contributor. In the Biophilia cluster, relationships with animals (e.g. "Lover of Pets," "Avoider of Pets," etc.) show significant contributions to explaining the variance in various aspects of empathy.

The two variables of Sympathy and Sex were prominently evident in the Forward Regression. Because sympathy and empathy are similar in their composition—and may actually have been perceived to be synonymous by the participants-- and because females consistently tap out higher on empathy than do males, two additional Forward Regressions were run. One had the variable of Sympathy removed (Figure 2), and the second had the two variables of Sex and Sympathy (Figure 3) removed. The differences were limited, but interesting. For instance, many of the biophilic variables became more prominent. When Sex and Sympathy were removed, Would Love a Dog and Would Love

a Cat appeared as the strongest variables on the QMEE Total Score. Would Love a Dog was positively correlated with the Literary Aspect, and Hater of Pets and Always Lived with Pets were negatively correlated with the Controlled Aspect. Similarly, Would Love a Horse and Would Love a Cat emerged as positive correlates with the Compassionate Aspect.

FIGURE 1

Forward Regression Analysis

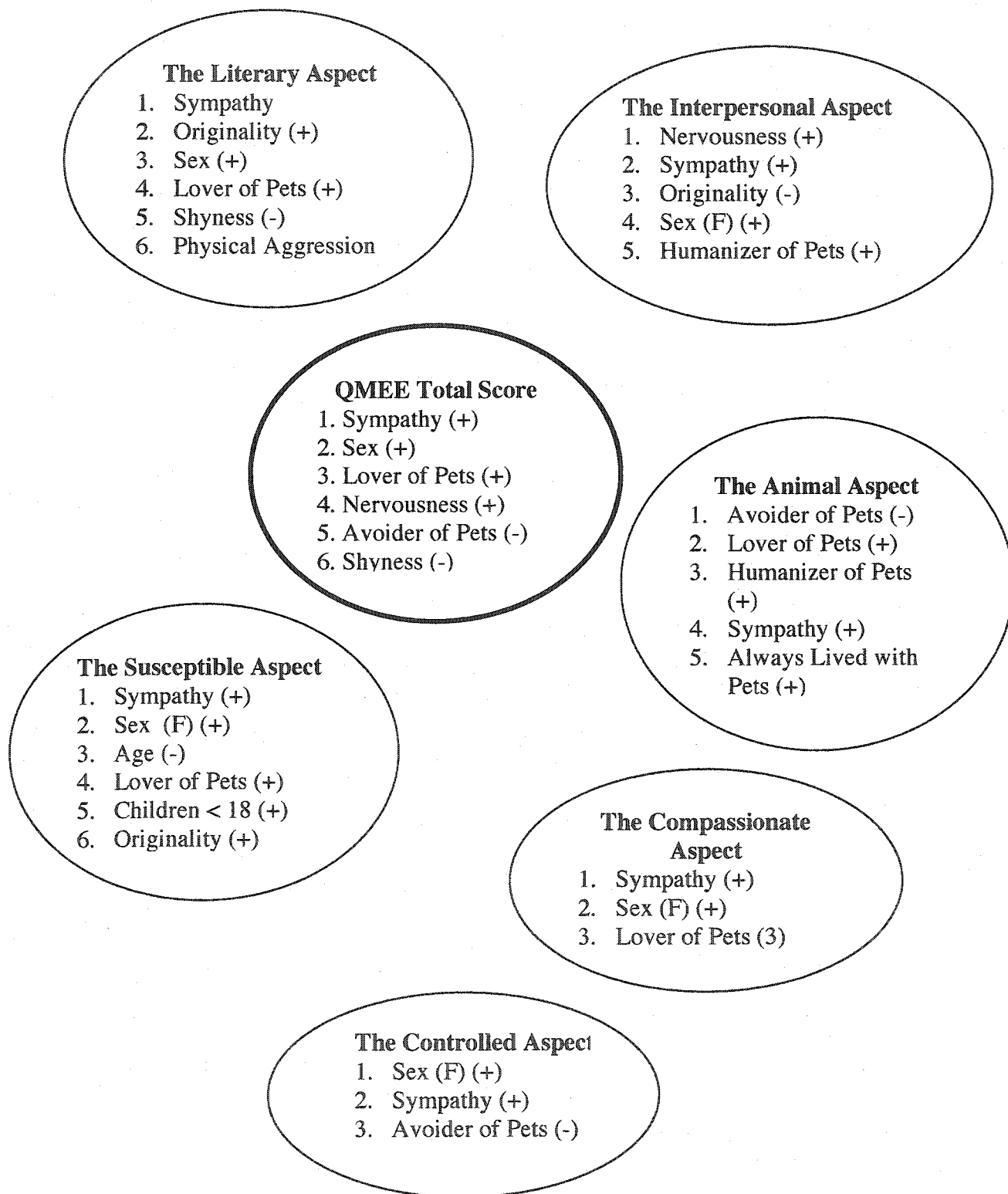


FIGURE 2

Forward Regression with the "Sympathy" Variable Removed

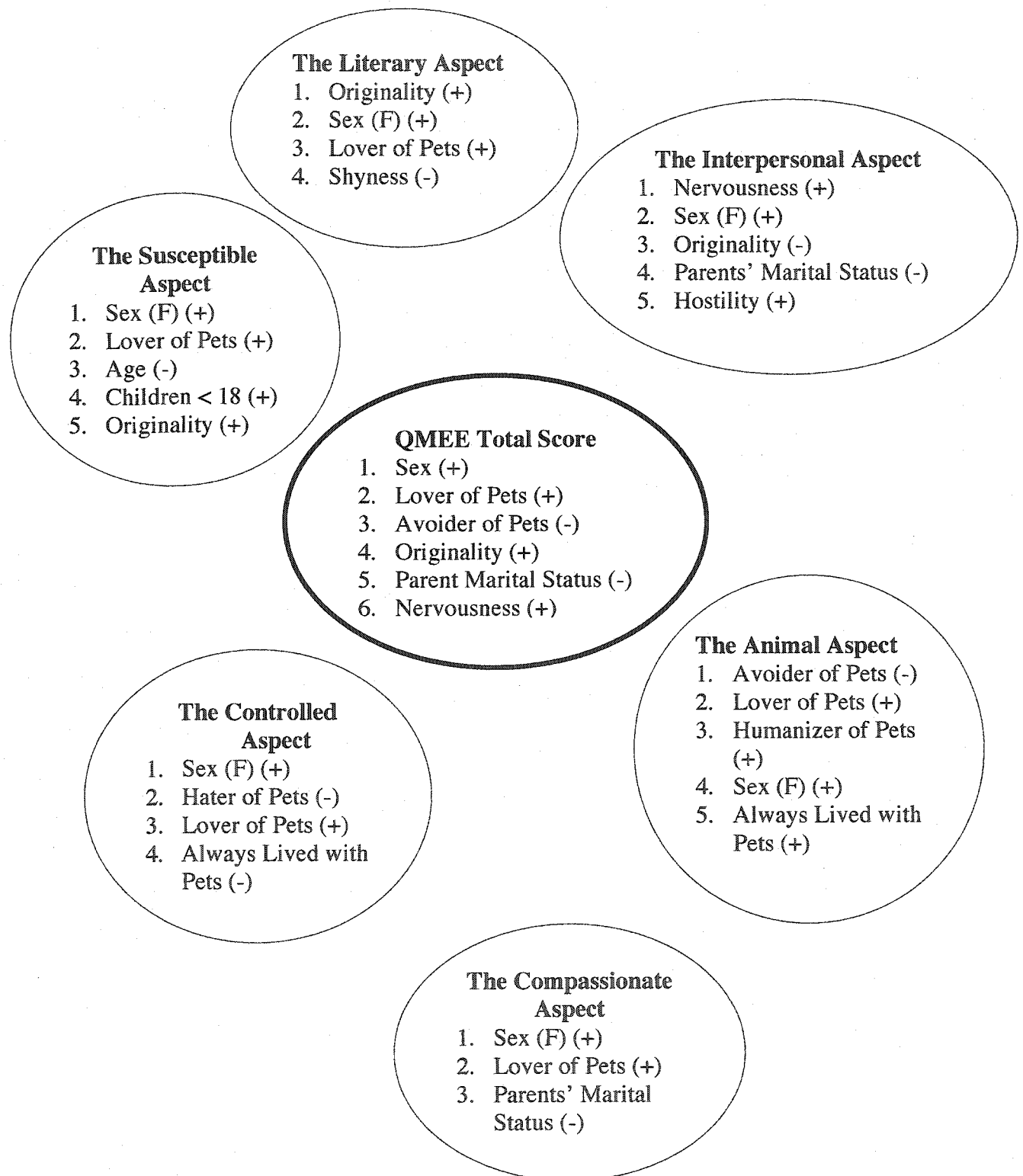
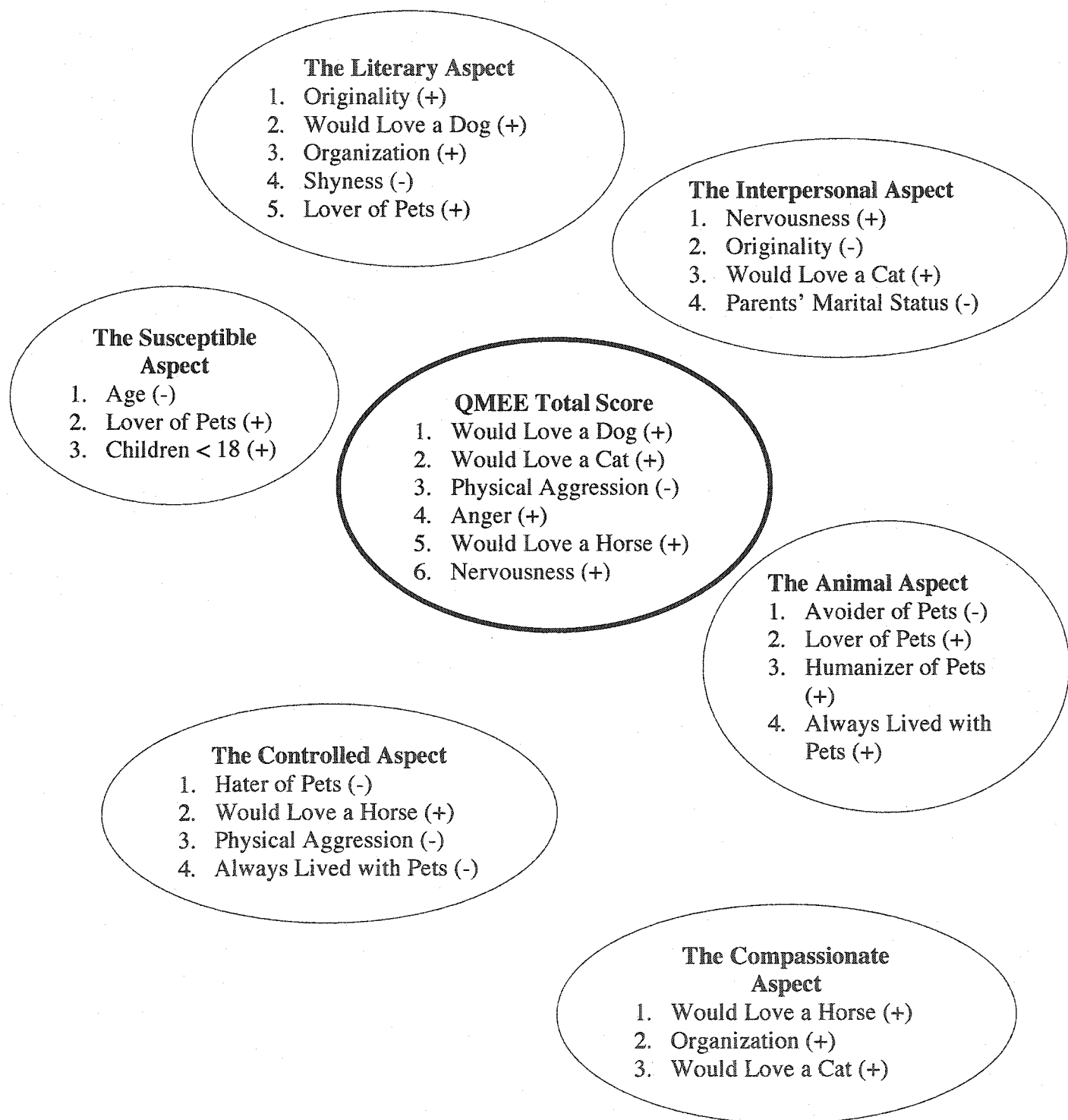


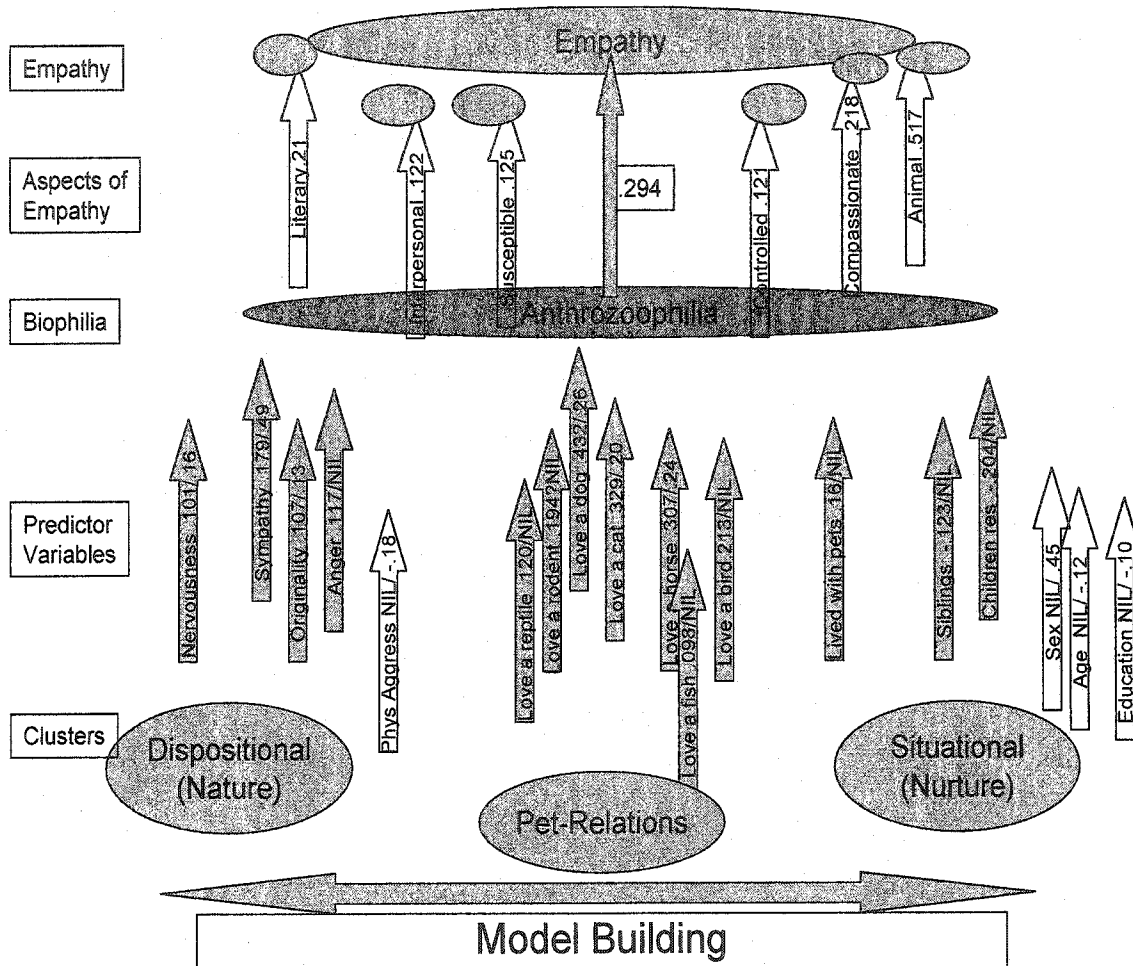
FIGURE 3

Forward Regression with the "Sympathy" and "Sex" Variables Removed



Model-Building. The overall findings can be configured in terms of model-building. Because biophilia encompasses all aspects of nature, a more specific designation is necessary to underscore that it is the human interest specifically in animals that is of importance to this particular model. Thus, for the purposes of this research, the Biophilial Cluster is divided into two sub-clusters in order to view it specifically in terms of pet-related variables. The first has been termed *anthrozoophilia* and while a preliminary construct, is determined by the two scales (1) Lovers of Pets (strong affect) and (2) Humanizers of Pets (strong valuation). Anthrozoophilia has been situated as a mediating variable. The second section is termed Pet-Relations and is comprised of the specific descriptors, such as “Love a Fish,” “Love a Horse,” etc., as well as history of pet relationships. As may be seen in Figure 4, then, (1) anthrozoophilia does predict empathy ($r = .294$), and (2) numerous variables from each cluster (Dispositional, Situational, and Pet-Relations) do correlate with this anthrozoophilial aspect of biophilia. In the figure for the predictor variables, the first coefficient indicates the correlation with anthrozoophilia and the second indicates the correlation with the total empathy score. The unfilled arrows in the predictor variables indicate those that were not correlated with biophilia but were correlated with empathy.

Figure 4



CHAPTER V

DISCUSSION

Review of the Purpose. The primary purpose of this investigation was to elaborate on what an empathic person looks like with respect to the way in which dispositional, situational, and biophilial variables impact empathy. Based on the review of literature, a number of variables from two seemingly opposing explanatory perspectives emerged as influencing empathy in individuals, or at least as contributing to the underpinnings of empathy. These opposing perspectives are rooted in (1) the dispositional nature of an individual (nature), largely linked to one's genes, or (2) the situational environment (nurture), largely linked to one's demographics and environmental experiences. The more realistic perspective, though, is an amalgam of both nature and nurture that argues for a dynamic interaction of genes and environment (Levine, 2002). These combined models are more prominent at this time. Such models might be configured as: nature yes, but also factor in variables related to familial, educational, experiential, history, and so on, with the primary focus on these situational determinants of empathy, as these are the determinants we can influence. Thus, interventions like educational programs ("Character Counts," "Roots of Empathy," role-playing, direct instruction, etc.) are plausible avenues of consideration if there is a good case for situational influences. Another area is family contributions to empathy development. A third area is comprised of simply general, but logically related, experiences. While the greater focus is the relationship between biophilia-type variables and empathy, the relative contributions of nature and nurture is the area largely unexplored, and thus, explored here.

Further to the research question, an area of particular interest was the empathic composition of individuals who choose nurturing career paths, and in particular, teaching as their career path. The importance for empathy in educational settings extends beyond pedagogy that is directed toward affecting caring and helping behaviours in students. As empathy training programs, and similar endeavours such as examining multiple and human intelligences among coworkers, have become increasingly popular within work environments, this logically extends to providing similar opportunities for educators, especially those in elementary and secondary settings. As such, the empathic composition of future educators is naturally of interest, and thus, teacher candidates served as the research sample.

While empathy, the dependent variable, was measured using the Questionnaire Measure of Emotional Empathy (QMEE) (Mehrabian & Epstein, 1972), the opportunity to explore empathy in more depth was present in that the factor structure of the QMEE yielded measures on different aspects of empathy. This had not been examined in earlier research, and it offers the potential to expand the current view of empathy. The six subscales that emerged from the factor analysis allowed for the categorization of empathy according to six different factors, which were termed: (1) The Literary Aspect, (2) The Interpersonal Aspect, (3) The Susceptible Aspect, (4) The Controlled Aspect, (5) The Compassionate Aspect, and (6) The Animal Aspect.

The discussion first addresses the QMEE total score and then the six aspects of empathy.

Dispositional Cluster

QMEE - Total Score. Correlational Analyses were run in order to determine which specific variables correlated with the total QMEE score. For the Dispositional

variables, it was predicted first that sympathy would show a positive correlation with empathy. This prediction was supported by the correlational analysis, which revealed that Sympathy was the strongest correlate from the Dispositional cluster.

This relationship between empathy and sympathy, however, is not surprising. Sympathy and empathy are often difficult to differentiate from each other (Davis, 1994; Eisenberg & Strayer, 1987), and are, at the least, minimally distinguishable. From an affective perspective, Rogers (1951) noted that empathy has an internal frame of reference, whereas sympathy is external. In other words, an empathizer feels “into” something, whereas a sympathizer feels “about” something. From a cognitive perspective, Batson and Coke (1983) advanced that in sympathy, unlike empathy, there is not an exact match between one’s own emotion and another’s. Eisenberg and Strayer (1987) acknowledged that sympathy, like empathy, is difficult to define. They advanced that sympathy involves the affective component of having a feeling of concern, but the cognitive component of realizing the concern is an outcome, rather than a part, of sympathy. In a more recent article (Baron-Cohen & Wheelright, 2004), the relationship between sympathy and empathy was given due consideration. Essentially, sympathy was regarded as a component of empathy. When a sympathetic individual observes distress, he or she may feel the emotion of desiring to take appropriate action to reduce the other’s distress, but does nothing. An empathic person, on the other hand, may not feel the desire to act, but does have an appropriate emotion in that he or she *reacts* to a person in distress. Generally, at least from a definitional perspective, sympathy seems to differ from empathy because it lacks the cognitive component, or what Baron-Cohen and Wheelright (2004) referred to as a “theory of mind.” Zhou et al. (2002) pointed out that

empathy, sympathy, and personal distress are difficult to delineate from one another in empirical research. Thus, in light of the similarity of their definitions, it is not surprising that sympathy and empathy are correlated, especially considering that divergent definitions of the two constructs were not evident to the present research participants. Also worth noting, in this context, was the fact that the correlation between sympathy and empathy was only moderate at best ($r = .49$) roughly translating to about 25% of the variance. This would indicate that much more is involved in explaining empathy than sympathy.

The second specific hypothesis, that high empathy individuals would be nonaggressive, was partially supported. Physical Aggression was significantly and negatively correlated with the QMEE Total Score, although Verbal Aggression was not. The negative relationship between Physical Aggression and the QMEE Total Score is not only intuitive, but a wealth of literature also substantiates the claim that empathy and aggressive behaviour are positively linked (Burke, 2001; Cohen & Strayer, 1996; Flynn, 2000; Miller & Eisenberg, 1988, etc.). Thus, while the findings for this research study accord with previous research exploring this relationship, what is clearer in the current data is that it is physical aggression that is related to empathy, more so than verbal aggression.

Interestingly, two variables positively related to the QMEE Total Score were Nervousness and Originality. It is perhaps worthwhile to contextualize these results by examining the characteristics of these two personality scales on the SONSO (Kentle, 1994). For instance, Nervousness encompasses such qualities as “worrying,” “depressed,” “troubled,” and “moody.” These may be qualities that an individual high in

the personality trait of Nervousness may identify with in other people, and thus a sharing of affect might be a natural result. Another possibility is that empathic individuals may be more prone to personal worries, moodiness and depression. Indeed, there may be a case for considering empathy in terms of both an inter-empathic and an intra-empathic focus.

Originality, on the other hand, includes “inquisitive,” “insightful,” “unconventional,” and “creative,” traits which may naturally lend themselves to a connection with other individuals, as well as a connection with one’s self. Originality may be pointing to the notion of an intra-empathic quality (insightful), a self-sensitiveness that can then extend to others, or an imagination (creative) that allows one to understand others. Alligood (1991) reported a positive correlation between creativity and empathy, and actualization and empathy, and found that combining creativity and actualization accounted for the variance in empathy more than they did separately. Creativity and actualization may tie to both an intra-empathic attribute and an inter-empathic ability.

Aspects of Empathy for the Dispositional Cluster. For each of the six Aspects of Empathy, Sympathy was also significantly correlated. In fact, with the exception of the Interpersonal Aspect, Sympathy was the strongest correlate for each of the Empathy Aspect subscales. This aligns with the speculation regarding the QMEE Total Score. What remains elusive, however, is why it does not correlate with the Interpersonal Aspect. Perhaps the five aspects of empathy that do correlate with Sympathy have elements of both the inter-empathic and the intra-empathic, whereas, the intra-empathic is not evident, or is mitigated, with respect to the Interpersonal Aspect.

Although it negatively correlated with the QMEE Total Score, Physical Aggression correlated negatively with only two Aspects of Empathy: the Controlled Aspect and the Animal Aspect. First, the negative relationship between aggression and the Controlled Aspect of empathy appears logical. For instance, it is interesting to note that the majority of statements which comprise this aspect invite individuals to gauge their concern with respect to other persons' problems (i.e., "I tend to get emotionally involved with a friend's problems," "I don't get upset just because a friend is acting upset," "Sometimes at the movies I am amused by the amount of crying and sniffing around me," "I become more irritated than sympathetic when I see someone's else's' tears," etc.). The negative correlation between this "controlled" aspect of empathy and physical aggression indicates that individuals who have difficulty dealing with another person's distress (i.e., high in control), are low in physical aggression. In other words, they likely restrain their aggression.

The negative relationship between Physical Aggression and the Animal Aspect of Empathy is also logical, yet interesting, given some facets of the literature on animal abuse. For instance, several researchers (Felthous & Kellert, 1986; Kellert & Felthous, 1985; Felthous & Kellert, 1987) have reported a relationship between childhood cruelty to animals and aggressive, even violent, behaviour as an adult. One study (Kellert & Felthous, 1985) found that aggressive criminals were reportedly more abusive toward animals than those who were moderately aggressive or nonaggressive. In fact, 25% of aggressive criminals indicated that they had been abusive toward animals. A similar finding was obtained in a later study by the same researchers (Felthous & Kellert, 1986).

In pointing to the relationship between animal cruelty and interpersonal violence, Flynn (2000) speculated that the inverse might also be true: by fostering and nurturing empathic attitudes toward animals, aggression could be reduced in adults. Similarly, Felthous and Kellert (1987) suggested that if aggression to animals can generalize to humans, then conversely, a compassionate ethic toward animals might generalize toward humans. Ascione (1992) explored this potential in a one-year humane education program for children in grades one, two, four, and five, and found diverse results. First of all, the enhancement of animal-related attitudes as a result of the intervention appeared to be related to grade: first- and second-graders showed no significant attitudinal differences on quantitative measures, while qualitative analyses suggested that the younger group enjoyed a greater enhancement. For the older grades, the fourth-graders showed a significant enhancement in attitude, while the fifth-graders did not. Further, there seemed to be a generalization for the grade four students from animal-related attitudes to human empathy. This resonates with an earlier study by Poresky (1990), who found a correlation between empathy for other children and for pets, and also reported that empathy for animals increases with age. While the absence of a significant effect for fifth-graders in the humane education program is somewhat puzzling (Ascione, 1992), it was speculated that there may have been some contamination with respect to the instruction for that particular experimental group.

That Physical Aggression, was significant, though Verbal Aggression was not, is somewhat understandable. In a discussion of physical and verbal aggression for the purposes of the Aggression Questionnaire (AQ), Buss and Perry (1992) assigned the two forms of aggression into one category, characterized by items related to hurting or

harming others, perhaps verbally, or that are instrumental or motor components of behaviour. In other words, they were not really distinguishable from one another. This definition was shared by Woolfolk, Winne, and Perry (2004), who also use it synonymously with “bullying” in reference to school-based behaviour. Further, the items that load onto the Physical Aggression factor of the AQ (“If somebody hits me, I hit back,” “I have threatened people I know,” “If I have to resort to violence...I will” etc.) appear to be much more representative of aggression than do those on the Verbal Aggression factor (“I often find myself disagreeing with people,” “My friends say I’m somewhat argumentative,” etc.).

Individuals high in the Interpersonal Aspect of Empathy were also high in Nervousness. Again, it may be the case that Nervous individuals are greater intra-empathics and can then extend this sensitivity more readily to others as inter-empathics. As words that describe Nervousness include “tense,” “worrying,” and “uneasy,” (Kentle, 1994), such individuals may be more introspective. This introspection, and subsequent sensitivity to their own inner life, may provide the resources for generating empathy for others.

Those who were high in the Literary and Susceptible Aspects of empathy were also high in Originality, whereas those high in the Interpersonal Aspect of empathy were significantly lower in Originality. The negative correlation between Originality and the Interpersonal Aspect is puzzling. However, since Originality is composed of such traits as “individualistic,” “unconventional,” and “philosophical,” it could be speculated that persons who are highly in tune with abstract ideas and are less conventional than others may be less interested in, or at least, less involved with, the ideas of others, and the

problems of others. Unless, of course, those “others” are encountered in the “Literary” venue.

The positive correlation with the Literary Aspect is interesting. Many of the items that comprise this aspect are related to the creative arts (“Some songs make me happy,” “I really get involved...in a novel,” “I become very involved when I watch a movie,” etc.). Thus, individuals who are high in Originality may be predisposed to an above-average interest in music, books, and movies, which would explain the significant positive relationship between Originality and the Literary Aspect. A similar rationale may explain the positive relationship with the Susceptible Aspect: this aspect involves emotional reactions based on observations (“Seeing people cry upsets me,” “Another’s laughter is not catching for me,” “I like to watch people open presents,” etc.). It may also follow, then, that for the same reasons that individuals high in Originality are attracted to artistic endeavours, they are prone to react emotionally to their surroundings.

With respect to Shyness, individuals who demonstrate higher empathy on the Literary Aspect are less shy, yet those high in the Interpersonal Aspect of Empathy are more shy. These differences may be reflected by the different types of statements for each of these Aspects. For example, items on the Literary Aspect include “Some songs make me happy” and “I become very involved when I watch a movie.” Sample items from the Interpersonal Aspect include “The people around me have a great influence on my moods” and “I am able to remain calm even though those around me worry.” In other words, the Literary Aspect seemingly describes more internalized and personal descriptions, whereas the Interpersonal Aspect involves relationships with other people. One explanation for the negative relationship in the latter Aspect is that shy persons are

more likely to be influenced (intimidated, etc.) by others. It may be less prominent in the items of the Literary Aspect because the questions that load onto this Aspect involve relationships more literary than real.

Individuals high in Organization were also high in the Literary, Controlled, and Compassionate Aspects of Empathy. Individuals who were organized self-reportedly were high in traits such as “efficient,” “systematic,” “precise,” “diligent,” and “practical.” These descriptors logically correlate with the Controlled Aspect, in which individuals identify with pragmatic and unemotional items, such as “I don’t get upset just because a friend is acting upset” and “I often find that I can remain cool in spite of the excitement around me.” It might be that one who is highly organized regards him or herself to be capable of controlling certain emotional situations. It could logically follow, then, that those high in the Literary Aspect of empathy might be less apt to be involved with people for the same practical and unemotional reasons. They may exhibit more control with respect to their intrapersonal traits, thus being attracted more to fiction and music, and be less prone to interaction with people. The correlation between Organization and the Compassionate Aspect is interesting, but again, organized individuals, for the same reason they are high in the Controlled Aspect, may feel a certain inclination toward compassion. Because Organization also contains such descriptors as “responsible” and “thorough,” it is perhaps not surprising that this variable correlates with the Compassionate Aspect, which contains such items as “Seeing people cry upsets me” and “It upsets me to see helpless old people.”

Situational Cluster

QMEE Total Score. It was hypothesized that, with respect to the Situational variables, individuals who were highly empathic would also be older, female, and the product of a humanistic, rather than a strict, discipline style in childhood. The first part of this hypothesis was supported, although support was not found for the discipline question. First of all, females were significantly more empathic than males. This accords with a wealth of empathy research that consistently points to females are being more empathic than males. Secondly, although age was significantly related to Empathy, it was, surprisingly, a negative correlation. As age increased, empathy decreased, and thus, the hypothesis was refuted.

The relationship between age and empathy is unsettled. Lennon and Eisenberg (1987) suggested that there was a dearth of research in the relationship between age and empathy outside the genetic and early developmental basis. In fact, they indicated that in reviewing the existing literature of age differences in empathy, it was difficult, given the diverse nature of the research, to draw concrete conclusions with respect to differential age changes related to empathy. Schieman and Gundy (2000) contended that virtually no studies existed that examined the relationship between age and empathy in adults.

In a study of adults working in nursing homes, Pennington and Pierce (1985) found that younger employees had more empathy than older staff members. In fact, the researchers found the results surprising, having expected that logically, older persons would have more empathy. They offered several reasons. First, older employees may feel more empathy, but a fear of becoming similar to their patients diminishes their display of empathy. Secondly, younger staff members may have received empathy

training during their schooling, whereas older workers may have been trained prior to these types of training initiatives. A third consideration was related to the fact that younger workers (high empathy) had less than five years' experience and older workers (low empathy) had six to ten years' experience: a burn-out effect may be prevalent, related to the highly stressful work environment to which nursing home employees are exposed. Similarly, Schieman and Gundy (2000) reported that older persons (average age = 58 years) reported lower levels of empathy in a community sample of adults. They cited such variables as a decrease in health and negative life role transitions (death of a spouse, loss of work, etc.). Royse, Dhooper, and Hatch (1987) also reported a negative relationship between age and empathy in a study of attitudes toward AIDS. The authors speculated that younger individuals might be more informed about AIDS, or are more tolerant of alternative lifestyles. Because the study was conducted in 1987, it is likely that the perception at the time was that AIDS was largely a disease that was contracted mainly by gay men.

Nevertheless, the population for the present research was a group of teacher candidates who were approximately two-thirds of the way through a 10-month program. The rationales offered for the age difference provided by the two aforementioned studies (Pennington and Pierce, 1985; Schieman & Van Gundy, 2000) do not logically apply in this instance. In a study of empathy in a group of medical students (Newton et al., 2000), it was speculated that empathy actually declines during subjects' undergraduate education. While empathy was significantly lower, regardless of sex, among individuals choosing non-core specialties (e.g., radiology and pathology) than those choosing core specialties (e.g., family medicine, pediatrics), the latter had significantly decreased

empathy scores by their third and fourth years of medical school. While the effect may have been related to specialty preference, it was emphasized that some form of intervention, such as role-playing, might be helpful in improving empathy by the later years. Nevertheless, it is possible that the evolving experience of the medical climate might also induce a loss of idealism for the students, which may contribute to the decline in empathy.

It is possible that the negative relationship between empathy and age might somehow tie into the negative relationship that presented between empathy and education. First of all, the education level for the population of this current study is fairly similar among all participants. For admission to the teacher education program, all candidates had at least an undergraduate (three- or four-year) degree (91.1%), while a minority also held advanced graduate or professional degrees (7.3%, Master's/equivalent 0.9%, Doctoral/equivalent). Nevertheless, the result is perplexing. For instance, Jenkins et al. (1992) found that grade point average (GPA) of graduate students was positively correlated with empathy, and speculated that intellectual proficiency might contribute to an increase. Shieman and Gundy (2000) reported that additional education actually mediated the negative relationship between age and empathy, thereby decreasing the gap. Yet the data in the present study are contrary to these results. The age effect, which would seem to be non-linear across the lifespan, might also be confounded with an education effect. A "Conservative Effect," in which people become more conservative with age may be operative here, assuming the stereotype that social conservatives are less caring. Also a "Social Distance Effect," in which education forces distance between groups, may be operative. It is a commonplace that distance between the sexes, the races,

cultures, and so on, logically hampers empathy. Education might create distance between people. Finally an "Effort Effect" may be operative. Educated individuals may attribute their successes to effort, and have less empathy for those they see as using less effort.

Surprisingly, there was no significant relationship between discipline history and empathy, which is inconsistent with the literature that suggests a relationship (Abraham et al., 1983; Barnett et al., 1980; Lopez et al., 2001). However, studies discussed in the literature review often addressed the quality of the relationship that individuals had with their parents, in addition, or with respect, to disciplinary environment. Thus, that the present research was limited to discipline history is likely a limitation of this study. A broader scope would appear to be warranted in future studies.

Aspects of Empathy for the Situational Cluster. As expected, Sex was also significant for each of the six Aspects of Empathy. As explained above, this is consistent with the research indicating that females are typically more empathic than males, at least as a result of the QMEE. Another interesting finding was that individuals who indicated that they grew up in homes in which both parents resided were higher on the Interpersonal and Compassionate Aspects of Empathy. All five items that comprise the "Interpersonal Aspect" have to do with other people, as do the six items that load onto the Compassionate Aspect. Interestingly, these are the only two aspects on which all of the items involve other people. There may be a case to be made for the theory that parental influence on children's socializing mediates certain aspects of empathy (Barnett, 1987; Hoffman, 1982). For instance, in a study of undergraduates' retrospective accounts of childhood (Barnett et al., 1980), high-empathy females reported that while mothers had discussed feelings with them, both parents had generally been more affectionate.

A study of four parenting dimensions that impacted adult empathy (Koestner et al., 1990) revealed, among other things, that three maternal factors were contributors (tolerance of dependent behaviour, inhibition of child aggression, satisfaction with mother role), but that paternal involvement in child care was also significant. In fact, the paternal influence on later empathic concern was “astonishing,” accounting for a larger percentage of the unique variance in the scores for empathic concern (13%) than the three maternal predictors combined. Because paternal involvement diminishes as result of most divorces, these results have important implications. Henry et al. (1996) also indicated that parental support and family cohesion contributed to empathic concern. These studies all lend credence to the notion that parental involvement and support are important contributors to socialization and empathy, elements of the Interpersonal Aspect.

The Animal Aspect also yielded some curious results. Age was negatively associated with this aspect, and females again were more empathic. Further, those who had young children (under 18) residing in the home (23.7% of the sample) were lower in the Animal Aspect of empathy. What is especially interesting about this finding is that it is the only one of the six Aspects of Empathy that shows a significant relationship between children under 18 and empathy. While it may be presumptuous to conclude that these findings are due to these particular individuals owning pets, as opposed to bearing more broadly on their feelings about animals, these findings do accord with research that shows that as children in a household increase, the number of pets in a household decrease. For instance, Melson (1988) reported that small families (one/two children) were more likely to own pets than were larger families (more than two children).

Similarly, Fifield and Forsyth (1999) found that pet ownership decreased as the number of household children increased. This may be linked to Kidd and Kidd's (1989) finding that adults who did not have children exhibited more attachment to their pets than did adults who were parents.

What might shed further light on these results is the inverse relationship between having pets in the house and animal cruelty discussed by several researchers (Albert & Bulcroft, 1988, Flynn, 2000, Veevers, 1985). Albert and Bulcroft (1988) have suggested that as adults make certain family transitions, such as to parenthood, pets may no longer be a source of affection, but actually become a source of stress. The study indicated that family members actually reported that there were lower levels of attachment to their pets at times when they had children or adolescents in the house, an age which corresponds with when many individuals first report witnessing or taking part in animal abuse. Veevers (1985) suggested that pets sometimes fill in as "surrogate enemies." Pointing to the label in child abuse literature "scapegoat child," the "scapegoat pet" was speculated to be consistent with this pattern. In fact, 88% of families in which children are abused reportedly have experienced pet abuse (DeViney, Dickert, & Lockwood, 1983).

Not surprising is the positive relationship found between the Animal Aspect of empathy, and individuals who indicated that they have always lived with pets. Serpell (1981) reported that individuals who had pets in childhood were more likely to have pets as adults than those who did not have pets as children. In a retrospective study of adults' attitudes toward pets, and their childhood relationship with pets (Poresky et al., 1988), a similar finding was reported: adults' contemporary attitudes toward pets were positively correlated with their retrospective attachment to their pets as children. Kidd and Kidd

(1989) similarly found that adults who owned pets in childhood were more attached to their pets, as adults, than those who did not own pets in childhood, or who first owned them as adults. In a later study (Paul & Serpell, 1993), researchers found that pet-keeping in childhood generally fosters more positive attitudes toward pets in adulthood. Further, adults who had pets in childhood were more likely to exhibit more humane attitudes in adulthood. Brickel (1985) maintained that human-animal relationships are rooted in learning theory, based on family experiences. Infants are positively exposed to animals symbolically, through toy animals, pictures, etc. Secondly, in families that obtain pets, children learn to love animals and, for the most part, foster positive experiences as a result of pet ownership. This persists into positive attitudes as adults. Essentially, people are taught to love animals in childhood, and thus the human-animal bond is enhanced and maintained through continued interaction and experience with animals.

The Biophilial Cluster

The third specific set of hypotheses regarding individuals with higher empathy was in relation to the Biophilial cluster of variables. It was predicted that individuals who were high in empathy have a history with pets, or are currently pet owners, have a positive attitude about pets, and prefer dogs over other pets.

QMEE Total Score. The hypotheses were partially supported. Individuals who were Lovers of Pets and Humanizers of Pets were highly empathic, and those who were Avoiders of Pets were low in empathy. Thus, as predicted, those with positive attitudes toward pets appear to be higher in general empathy. The causal direction of the relationship is not clear. It is possible that individuals high in empathy show a

predisposition to bond with animals. On the other hand, it is possible that individuals with pet relationships show enhanced empathy. Given the psychological variables from the Dispositional cluster (i.e., Originality, Nervousness, Shyness, Aggression, etc.) that correlate with empathy, as well as the demographic variables from the Situational cluster (i.e., two-parent families, young children in the home, age, sex), it would seem that an interactive model might be the best configuration. That is, there are “nature” and “nurture” variables that contribute to empathic development, likely in an interactive or reciprocal fashion.

Another consideration, especially with respect to “Humanizer of Pets,” is that, individuals who treat their pets like other people might also generalize their empathy toward people. Beck and Katcher (1996) pointed out that, just as children humanize toy animals, people also assign human qualities to animals. For instance, they name their pets, and often in a more creative manner, or in a way that symbolically connects the person to the pet, than in naming children. Similarly, pets are often welcome in adult beds whereas even children are banished to their own rooms. People also engage in conversation with animals, enjoy a “deeply felt and solemn pleasure” from feeding pets their own food, celebrate their birthdays, dress them in outfits and jewellery, ensure their medical care, and provide them with respectful and meaningful burials.

There was only partial support indicated by the QMEE Total Score for the prediction that individuals who are high in general empathy prefer dogs over other animals. While individuals who indicated that they would love to have a dog were higher in empathy, so were those who indicated that they would love to have a cat or a horse. The “Would Love to Have a Cat” correlation is different from a recent study with

children (Daly & Morton, 2003), where those children who indicated they would love to have a cat, or who did already have a cat, were lower in empathy (Bryant Empathy Index, 1982) than individuals who had, or preferred dogs, or who had no pets at all. Perhaps this dog-cat effect is different with adults than with children, or requires a more fine-grained exploration in both age groups. As such, based on the limited research on adults, personality and pet preference, the results are inconclusive.

Another study (Kidd and Kidd, 1980) examined gender differences and personality variables related to pets. Male cat-lovers were higher in autonomy, female cat-lovers were lower in dominance, all cat-lovers were lower in nurturance, and female cat-lovers were lower in aggression. A more recent study (Perrine & Osbourne, 1998) looked at differences between dog and cat owners, on both self-reported differences and observed differences. The differences were limited. Dog-persons, irrespective of gender, rated themselves higher on masculinity than did cat-persons, and were also perceived to be more masculine than cat persons. While neither dog- or cat-persons rated themselves differently on femininity, male dog-persons were perceived as lower on femininity. Again, though dog- and cat-persons did not perceive themselves as different on dominance, male dog-persons were perceived to be more dominant than the other three groups. While there were no self-perceived differences on athleticism, dog-persons were perceived as being more athletic than cat-persons.

The preference for horses was also interesting, considering that the majority of the current sample resided in an urban setting. This preference could be linked to an idealized perception of living in a rural environment. Kalliopuska (1994) found that individuals who live in the countryside were more empathic and emotional than those in cities. This

is consistent with Alcock's (2004) discussion of extant research indicating that individuals in small towns, or rural environments, are more helpful and friendly than those in cities. Because horses are more prevalent in a rural environment, it might also follow that there is a pattern connecting people who prefer such environments with people who feel positively about horses.

However, the way in which the question was asked may have been a limitation to the present research. For instance, individuals were not asked if they generally prefer one animal over another, but rather, rated their preference for various animals. It may be logical to presume that individuals would choose, as a pet, the animals which they most prefer.

Aspects of Empathy for the Biophilia Cluster. Interestingly, there were a number of significant variables that appeared consistently throughout the six Aspects of Empathy. The most curious finding is with respect to the Interpersonal Aspect. For instance, dog and horse lovers are high on all Aspects of Empathy *except* the Interpersonal Aspect. Further, those who are self-described pet lovers are also high on all Aspects of Empathy with the exception of The Interpersonal Aspect. First, this particular Aspect contains five items, all of which are related to one's mood being influenced by other people, and thus each having to do with people. Secondly, the item "I become nervous if others around me seem to be nervous" appears only on this scale. It is therefore possible that individuals who are susceptible to nervousness may feel less positively toward animals, which intuitively makes sense with respect to people who are fearful of animals, for either psychological or cultural reasons.

The love for cats also persists into the six Aspects of Empathy. With the exception of the Literary Aspect, those who indicated that they would love to have a cat are high on all Aspects of Empathy. As discussed above, the inconclusive research with respect to dog- and cat-owners' personality characteristics warrant further research. Further, Avoider of Pets was negatively correlated to the Susceptible, Controlled, and Animal Aspects. The logic of the negative relationship between Avoider of Pet and the Animal Aspect is clear. However, it is interesting that individuals who are reportedly Avoiders of Pets are low in Susceptible and Controlled Aspects of empathy. It may be that individuals who prefer not to be around pets are low in many of the self-control traits that go into these two aspects ("Seeing people cry upsets me," "I tend to lose control when I am bringing bad news to people," "Another's laughter is not catching for me," etc.), and that being around animals may compromise their comfort zones.

The Model-Building Question

The second major focus, and prediction, was that the Situational cluster would be a more prominent configuration for predicting empathy than the Dispositional, or the Biophilia cluster. This was refuted. In fact, the cluster that seemed to be the strongest predictor of empathy was the Dispositional cluster. Situational was second, and the Biophilia cluster was the weakest predictor (Figure 1). However, when certain variables were removed from the analysis, such as Sex (Figure 2), or Sex and Sympathy Figure 3, a different pattern of results emerged that actually favoured the Biophilia cluster. For instance, even when Sex or Sympathy were removed from the analysis, Would Love a Dog and Would Love a Cat remain the strongest predictors of the QMEE Total Score, suggesting that individuals who feel positively about these animals are higher in

empathy, regardless of sex. Moreover, the negative correlation between the Controlled Aspect, and the two variables of Avoider of Pets and Always Lived with Pets, appear, at least intuitively, contradictory. It does suggest, however, that there might be something dispositional at play here. For instance, those who tend to dislike, or avoid, animals may be exerting a more controlled form of empathy than those who are characterized as Lovers of Pets. On the other hand, those who have lived with pets might also feel higher in the Controlled Aspect, perhaps due to some extenuating variable related to the experience of living with pets.

Limitations to the Study

Several limitations to the present study should be considered for the interpretation and the generalizability of the results. First of all, with respect to the participants, it should be noted that they comprised a fairly homogenous sample group. For instance, although it was of interest to the researcher whether individuals who choose a career path in the teaching profession exhibit specific empathic traits, caution should be taken in presuming a generalization of these results to another sample outside the education profession. Further, the majority (82.3%) were reportedly raised in two-parent households.

There may also be limitations as a result of several of the instruments that were utilized. For instance, self-report instruments of empathy are typically more favourable toward females than males (Lennon & Eisenberg, 1987). While there are other reasons, suggested throughout this research paper, that females may exhibit more empathy than males, it should be noted, that a self-report measure of empathy (QMEE) was employed in this study. Further, the Discipline History questionnaire (Appendix A3) was intended to gather information regarding the types of discipline techniques encountered by the individual. However, additional information with respect to frequency of specific behaviours, as well as parental warmth and attitudes, might have provided further information for interpretation in the results. Moreover, because it was the first time this instrument was used, there was no reported validity or reliability.

Finally, the extensive data collection procedure may have also posed some limitations. Because of the extensive number of questionnaires the participants were asked to complete, a "fatigue factor" should be taken into consideration. For instance,

the SONSO Personality Inventory (Kentle, 1994) contained 50 adjectives to which the individuals were asked to respond. Obviously, it was not possible to ensure that each answer was given due consideration by the respondent.

Prior to analyzing the data, an attempt was made to by the researcher to assess the quality of the responses. A rating of 4 indicated that the questionnaires were complete and thorough. A rating of 3 indicated that, for the most part, the questionnaires were complete and thorough, and that minor errors or omissions were few. A rating of 2 indicated that there were a number of errors or omissions, while a rating of 1 indicated that the majority of the questionnaires were not complete. While the researcher made every effort to code the data by assessing the completeness of the instruments, the quality of all the responses can obviously not be totally assured.

Conclusion

A number of interesting findings resulted from this study. One major and unplanned finding was in relation to the dependent variable, the Questionnaire Measure of Emotional Empathy (QMEE) (Mehrabian & Epstein, 1972). As a result of factor analysis, six subscales emerged that were different from the original development of the instrument. These were termed "Aspects of Empathy," as they provided the unique opportunity to examine empathy as a composition of six types. They were termed: (1) The Literary Aspect, (2) The Interpersonal Aspect, (3) the Susceptible Aspect, (4) The Controlled Aspect, (5) The Compassionate Aspect, and (6) The Animal Aspect.

The purpose of this research was to determine what an empathic person "looks like." Both correlations and regression analyses contributed to this endeavour. For general Empathy, when the three clusters (Dispositional, Situational, Biophilial) are

combined, it would appear that a high-empathy individual is sympathetic and non-aggressive (Dispositional), female (Situational), and generally likes, or feels positively about, animals (Biophilial). On the other hand, persons who are shy, or who avoid animals, appear to be less empathic. Overall, the Dispositional cluster was the strongest predictor of empathy.

With respect to the Aspects of Empathy, a similar pattern appeared, although the opportunity to examine empathy in more detail was evident as a result of these six Aspects. There were also some interesting findings with respect to specific variables. For instance, parental marital status emerged as a negative predictor for the Interpersonal and Animal Aspects, and Age negatively predicted empathy for the Susceptible Aspect.

While the hypotheses related to the biophilic variables were partially supported, the most intriguing findings of this research, related to the significance of certain pet-related variables to empathy, were actually unrelated to the specific research questions. However, they provided the opportunity for narrowing the biophilia hypothesis and reconsidering this theoretical framework with a specific emphasis on animals. Thus, when the Biophilia cluster was reconfigured based on only two of the variables, (1) Lover of Pets and (2) Humanizer of Pets, it is viewed as a significant mediating variable between the three clusters of empathy correlates (Figure 4). The term *anthrozoophilia*, as an aspect of biophilia, seems to serve as a mediating construct that correlates with dispositional, situational, and pet-related variables, and directly correlates with empathy.

Another significant finding in this dissertation, beyond the broadening of the current view of empathy, is the potential importance of biophilia, and anthrozoophilia, with respect to empathy development, and the potential importance of biophilia, and

anthrozoophilia, with respect to theoretical development. For instance, the research into the nature of the human-animal bond provides empirical evidence indicating that animals do elicit positive human qualities, and a large portion of this research is devoted particularly to empathy. Yet, evidence for the nature of this effect, particularly related to the quality and degree of attachment between humans and their pets, remains inconclusive. Although some researchers have indicated that the degree to which an individual bonds to his or her pet is the definitive link to increased empathy, others have reported equally compelling evidence that the presence of, or attitude toward, pets may be just as important. The nature of biophilia advances the latter: if, as the biophilia hypothesis speculates, humans have an innate interest in nature, then it naturally follows that they are predisposed to an interest in animals. This speculation was supported by this particular research. When two variables -- Lovers of Pets and Humanizers of Pets --- were isolated from biophilia, the subset, anthrozoophilia, was significantly correlated to empathy.

Moreover, it is interesting to consider the six Aspects of Empathy for the way in which they logically relate to various domains of empathic relations. The Controlled and Susceptible Aspects relate to self-empathy or the self domain. The Compassionate and Interpersonal Aspects can be seen as relating to empathy for family and friends, those familiar to an individual. The Literary Aspect parallels empathy for people who may be more distant, such as acquaintances or strangers, and the Animal Aspect is connected to empathy related to other life forms (Figure 5).

Building Empathic Relations

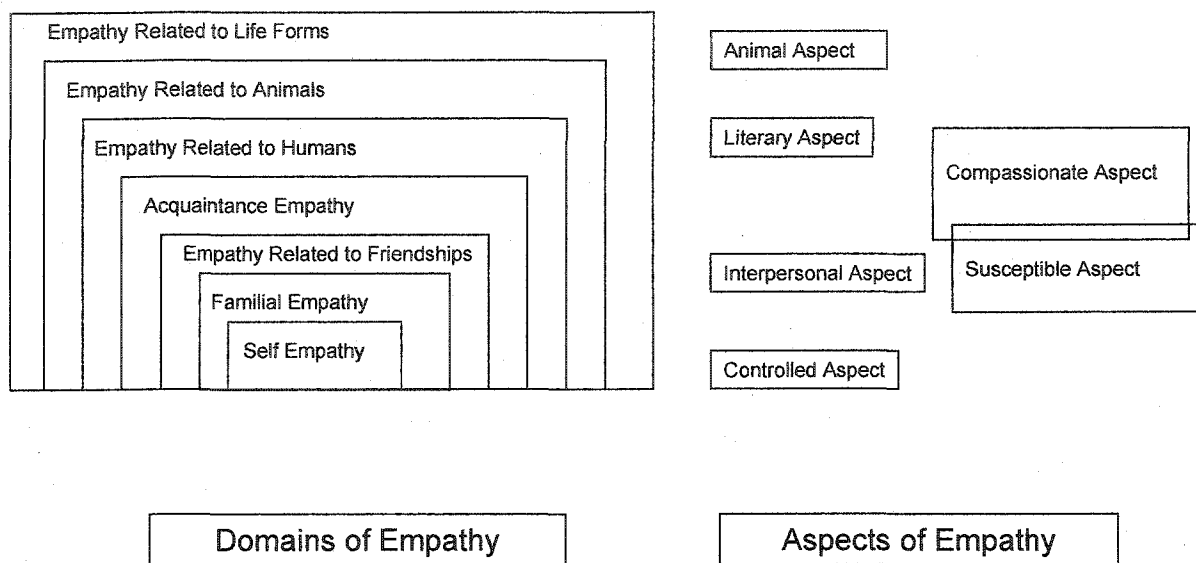


Figure 5

Implications for Future Research

The findings in this study have far-reaching implications for a variety of research endeavours. For improving empathy in educational environments, for instance, the impact of pet visitation programs is an area that should be further explored. If, as suggested by some of the findings in this study, the presence of pets, or attitude toward animals, has an impact on empathy in childhood, it would be a worthy investigation. Similarly, the prominence of females to be more empathic than males could also have implications for the social composition of schools and the way in which educators interact with students. For instance, it might be interesting to examine this specific factor within the context of the current trend to consider segregating the sexes in different educational environments. Of interest might also be to examine whether sex differences in teachers, and the empathy that may be a factor with respect to these differences, have any impact within specific types of teaching environments, such as those with special needs or second-language students. Whether such a relationship exists may extend to further study into what considerations are given when selecting teachers for these particular classes. Moreover, that certain personality variables reportedly link to different aspects of empathy might also be of interest to teacher selection, not only with respect to certain classrooms, but also within different demographic neighbourhoods that may benefit from the result of realizing these differences.

Theoretically, the results of this research yield a wealth of implications for further explorations into the nature of empathy. For instance, that age is negatively correlated with higher empathy individuals is somewhat puzzling. While it could possibly be attributed to a loss of idealism that may naturally evolve with maturity, that it may be

due, at least in part, to “burnout” or stress related to specific environments, makes it an especially important area of research in teacher education, which is a notably stressful environment. A decline in empathy for seasoned teachers has obvious negative implications for the teaching environment as a whole, but particularly for the potential emotional effects on students. Further, research into this particular area may extend into examining the value of empathy development programs for teachers, similar to the pedagogy programs already in place for students.

What is particularly noteworthy is the finding that empathy appears to have various components, and it can thus be regarded as having “aspects.” The potential generalization of the Aspects of Empathy is worth examining with respect to other populations in future research endeavours. To examine empathy in terms of different types may contribute to the growing body of literature dedicated to examining the nature of empathy, and the contributions to its growth and development. Further, that empathy can be compartmentalized is an inviting concept with respect to examining specific populations. Individuals who have typically not been perceived as empathic might actually be high on some Aspects of empathy. As such, the opportunity to focus on the Aspects of empathy may contribute to expanded views of the way in which empathy is developed.

Another focus for the Aspects of empathy could be in educational settings. For instance, the implementation of such programs as *Character Counts* and *The Roots of Empathy* suggest that school administrators generally embrace the idea that empathy can be taught. Again, by examining empathy in various Aspects, the effectiveness of measuring empathy could be improved. Furthermore, the Aspect in which some children

are higher might be a valuable consideration for their learning and in selecting effective teaching strategies and tools. For instance, children who are higher in the Animal Aspect of empathy might respond better to materials and lessons that include animals and nature as their focus; those higher in the Literary Aspect might be more passive learners who respond better by viewing and listening; and those high in the Interpersonal Aspect of empathy might thrive in cooperative learning environments.

Finally, further study related to *anthrozoophilia* as an aspect of biophilia is vital for the way in which this new theory correlates with empathy. Given that the nature of biophilia with respect to empathy is speculative within the expanse of research in human-animal relationships, this more refined aspect, as it relates specifically to animals, invites investigation that might offer more conclusive evidence for the way in which animals positively impact social and emotional development. Clearly, animals play an important role, at a number of levels, in the development of empathy. Although the specific nature of the role is speculative, existing evidence and on-going research consistently points to the benefits of human-animal relationships.

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APPENDIX A: Instrumentation

Appendix A1

Aggression Questionnaire

(Buss & Perry, 1992)

	Extremely characteristic of me	Characteristic of me	Neutral	Uncharacteristic of me	Extremely uncharacteristic of me
Physical Aggression					
1) Once in a while, I can't control the urge to strike another person	5	4	3	2	1
2) Given enough provocation, I might hit another person	5	4	3	2	1
3) If somebody hits me, I hit back.	5	4	3	2	1
3) I get into fights a little more than the average person.	5	4	3	2	1
5) If I have to resort to violence to protect my rights, I will.	5	4	3	2	1
6) There are people who pushed me so far that we came to blows.	5	4	3	2	1
7) I can think of no good reason for ever hitting a person.	5	4	3	2	1
8) I have threatened people I know.	5	4	3	2	1
9) I have become so mad that I have broken things.	5	4	3	2	1
Verbal Aggression					
1) I often find myself disagreeing with people.	5	4	3	2	1
2) When people annoy me, I may tell them what I think of them.	5	4	3	2	1
3) I can't help getting into arguments when people disagree.	5	4	3	2	1

	Extremely characteristic of me	Characteristic of me	Neutral	Uncharacteris- tic of me	Extremely uncharacteristic of me
4) My friends say I'm somewhat argumentative.	5	4	3	2	1

Anger

1) I flare up quickly but get over it quickly	5	4	3	2	1
2) When frustrated, I let my irritation show.	5	4	3	2	1
3) Sometimes I feel like a powder keg ready to explode.	5	4	3	2	1
4) I am an even-tempered person.	5	4	3	2	1
5) Some of my friends think I'm a hothead.	5	4	3	2	1
6) Sometimes I fly off the handle for no good reason.	5	4	3	2	1
7) I have trouble controlling my temper.	5	4	3	2	1

Hostility

1) I am sometimes eaten up with jealousy.	5	4	3	2	1
2) At times I feel I've gotten a raw deal out of life.	5	4	3	2	1
3) Other people always seem to get the breaks.	5	4	3	2	1
4) I wonder why sometimes I feel so bitter about things.	5	4	3	2	1
5) I know that "friends" talk about me behind my back.	5	4	3	2	1
6) I sometimes feel that people are laughing at me behind my back.	5	4	3	2	1

Appendix A2

Demographic History Questionnaire

Please indicate your response by circling the appropriate letter.

- 1) **What sex are you?**
 - a. Male
 - b. Female

- 2) **What is your race?**
 - a. White
 - b. Native Canadian
 - c. African descent
 - d. Hispanic
 - e. Middle Eastern
 - f. Other (please specify): _____

- 3) **How old are you?**
 - a. 21-25
 - b. 26-30
 - c. 31-35
 - d. 36-40
 - e. Over 40

- 4) **What is your marital status?**
 - a. Divorced/separated
 - b. Single (never married)
 - c. Married/Living with partner
 - d. Widowed

- 5) **What is your highest level of education?**
 - a. Bachelor's degree/equivalent
 - b. Master's/Professional certification
 - c. Doctoral/equivalent
 - d. Other (please explain): _____

- 6) **What best describes your permanent place of residence?**
 - a. Apartment/Condo
 - b. Single-family dwelling (house)
 - c. Trailer
 - d. Residence/Campus Housing
 - e. Other (please specify): _____

- 7) What best describes the area in which you permanently reside?
- Urban (city)
 - Rural (farm, etc.)
- 8) How many children (under 18) live with you in your permanent residence?
- 0
 - 1
 - 2
 - 3
 - More than 3
- 9) What was your combined annual household income last year?
- Below \$20,000
 - \$20,000-\$40,000
 - \$41,000-\$60,000
 - \$61,000-\$80,000
 - \$81,000-\$100,000
 - Over \$100,000
- 10) Were you raised in Canada? (If YES, please skip ahead to question #12):
- Yes (please skip ahead to question #12)
 - No
- 11) In which country were you raised? (Please specify): _____
- 12) At what age did you move to Canada? (Please specify in years): _____
- 13) With how many siblings were you raised?
- 0
 - 1
 - 2
 - 3
 - More than 3
- 14) What best describes your perceived financial status throughout your childhood?
- I felt we were rich.
 - I felt that we were comfortable.
 - I felt that we had just what we needed.
 - I felt that we often went without things that we needed.
 - I felt that we struggled financially.
 - I felt that we were poor.
- 15) What was your parents' marital status when you were growing up?
- Always married
 - Never married

- c. Divorced/separated before I was 5
- d. Divorced/separated before I was 12
- e. Divorced/separated before I was 18
- f. Other (please indicate): _____

16) With whom did you live (primary caregiver) when you were growing up?

- a. Both parents
- b. Mother
- c. Father
- d. Joint custody (mother & father)
- e. Mother and stepfather
- f. Father and stepmother
- Other (please describe): _____

Appendix A3

Discipline History

- 1) The person most responsible for my discipline while I was growing up was:
 - a. My mother
 - b. My father
 - c. My grandparent
 - d. My legal guardian
 - e. Other (sibling, etc.)
 - f. Mother and father

- 2) When I misbehaved, I was *physically* disciplined in some way (spanked, strapped, restrained, etc.)
 - a. Always
 - b. Usually
 - c. Sometimes
 - d. Rarely
 - e. Never

- 3) When I misbehaved, my parent/disciplinarian talked to me about why my behaviour was wrong or inappropriate.
 - a. Always
 - b. Usually
 - c. Sometimes
 - d. Rarely
 - e. Never

- 4) If I had children, I would discipline them in the same way that I was disciplined when growing up.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree

- 5) I approve of the way I was disciplined while I was growing up.
 - a. Strongly agree
 - b. Agree
 - c. Not sure
 - d. Disagree
 - e. Strongly disagree

- 6) My parents/disciplinarians were very lenient.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
- 7) I believe that I was disciplined fairly.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
- 8) My parents/disciplinarians were very strict.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
- 9) I would recommend that other children be disciplined similar to how I was disciplined.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
- 10) My parents/disciplinarians took time to listen to me when I explained my actions.
- Strongly agree
 - Agree
 - Not sure
 - Disagree
 - Strongly disagree
- 11) When it comes to the way I was disciplined while growing up, I would describe my parents/disciplinarians as having been:
- Unreasonably strict
 - Very strict
 - Strict but fair
 - Lenient
 - Permissive

Appendix A4

The Pet Attitude Scale

(Templer, Salter, Dickey, Baldwin, and Veleber, 1981)

	Strongly Agree	Agree	Neither agree or disagree	Agree	Strongly Disagree
1) I really like seeing pets enjoy their food.	5	4	3	2	1
2) My pet means more to me than any of my friends (or would if I had a pet)	5	4	3	2	1
3) I would like to have a pet in my home.	5	4	3	2	1
4) Having pets is a waste of money.	5	4	3	2	1
5) Housepets add happiness to my life (or would if I had a pet)	5	4	3	2	1
6) I feel that pets should always be kept outside.	5	4	3	2	1
7) I spend time every day playing with my pet (or would if I had a pet)	5	4	3	2	1
8) I have occasionally communicated with a pet and understood what it was trying to express.	5	4	3	2	1
9) The world would be a better place if people would stop spending so much time caring for their pets and started caring more for other human beings instead.	5	4	3	2	1
10) I like to feed animals from my hand.	5	4	3	2	1
11) I love pets.	5	4	3	2	1
12) Animals belong in the wild or in zoos, but not in homes.	5	4	3	2	1
13) If you keep pets in the house you can expect a lot of damage to furniture.	5	4	3	2	1
14) I like housepets.	5	4	3	2	1
15) Pets are fun but it's not worth the trouble of owning one.	5	4	3	2	1

	Strongly Agree	Agree	Neither agree or disagree	Agree	Strongly Disagree
16) I frequently talk to my pet (<i>or would if I had one</i>).	5	4	3	2	1
17) I hate animals.	5	4	3	2	1
18) You should treat your housepets with as much respect as you would a human member of your family.	5	4	3	2	1

Appendix A5

Pet Ownership & History of Pet Ownership

Please circle the appropriate response. For questions regarding a pet, please consider one specific pet when completing this survey.

- 1) Do you currently have a pet? (If "NO", please go to question #8)
 - a. Yes
 - b. No (please skip to question # 8)

- 2) What kind of pet(s) do you have right now? (Circle all that apply and indicate how many of each)
 - a. Dog(s)- How many?
 - b. Cat(s)- How many?
 - c. Bird(s)- How many?
 - d. Fish-How many?
 - e. Other (please indicate): _____

- 3) If you have a dog, please indicate what breed it is: _____

- 4) Who is the primary owner of this pet?
 - a. I am
 - b. It is a family pet
 - c. The pet belongs to my spouse/partner/roommate
 - d. The pet belongs to my child(ren)
 - e. Other (please specify): _____

- 5) If you have more than one pet living with you now, which pet is your favourite, or do you feel most attached to?
 - a. Dog
 - b. Cat
 - c. Bird
 - d. Fish
 - e. Other (please specify): _____

- 6) Considering the pet you indicated from #5, how long have you had this pet?
 - a. Less than 6 months
 - b. Less than 1 year
 - c. 1-5 years
 - d. 5-10 years
 - e. More than 10 years

- 7) How did you obtain this pet?
- I/we adopted him from a pound/shelter/similar circumstance
 - Born to a pet I already owned
 - Bought the pet from a breeder
 - Bought the pet from a pet store
 - It was a gift to me
 - Stray (found it)
 - Other (please explain): _____
- 8) If you don't have a pet, would you like to have one now? (If you already have a pet, please go to #11)
- Yes
 - No
- 9) If you don't have a pet but would like one, what kind would you like to have? (Circle all that apply):
- I wouldn't like to have a pet.
 - Dog(s)
 - Cat(s)
 - Bird(s)
 - Fish
 - Horse(s)
 - Other (please specify): _____
- 10) If you don't have a pet but would like one, what is your reason for not having a pet right now? (Circle all that apply):
- I am allergic.
 - I am not allowed to keep one in my current residence.
 - I couldn't afford the cost of a pet right now.
 - I don't enjoy animals.
 - I don't have the time to take care of the pet.
 - Other household members are allergic to animals.
 - Other household members do not want a pet.
 - Other (please explain): _____
- 11) At what stage in your life have you lived with pets? (Circle all that apply):
- Never
 - Childhood (1-12 years)
 - Adolescence (13-18 years)
 - Young Adulthood (19-30 years)
 - Middle Adulthood (31-61 years)

- 12) Did you grow up with pets?
- Yes
 - No (if NO, you are completed this survey; please go the next questionnaire).
- 13) If yes, what kind of pets did you have? (Circle all that apply):
- Dog(s)
 - Cat(s)
 - Fish
 - Bird(s)
 - Reptile(s)/Amphibians (ex. Newts, hermit crabs, etc.)
 - Rodent(s) (ex. Hamsters, gerbils, etc.)
 - Horse(s)
 - Rabbit(s)
 - Other (please specify): _____
- 14) At what age did you feel that you were first responsible for the care of a pet?
- Never, someone else always took care of it. (If "never," please skip to question #18)
 - Childhood (1-12 years)
 - Adolescence (13-18)
 - Young adulthood (19-30)
 - Middle adulthood (31-61)
- 15) For what kind of pet were your first responsible?
- Dog
 - Cat
 - Fish
 - Bird
 - Reptile/Amphibian
 - Rodent
 - Horse
 - Rabbit
 - Other (please specify): _____
- 16) To whom did this pet primarily belong?
- Me
 - Sibling (brother/sister)
 - Mother/father
 - Neighbour/Friend/Relative (pet did not live with me)
 - It was a family pet

- 17) How attached were you to this pet for whom you were responsible?
- Extremely attached
 - Somewhat attached
 - Not very attached
 - Not attached at all
- 18) Which type of pet was your favourite (or are you considering for the remainder of this survey)? Please choose your favourite (or one specific) pet from your childhood and consider this pet for the remainder of the questions
- Dog
 - Cat
 - Fish
 - Bird
 - Reptile/Amphibian
 - Rodent
 - Horse
 - Rabbit
 - Other (please specify):
- 19) To whom did this pet primarily belong?
- Me
 - It was a family pet
 - My sibling (brother/sister)
 - Mother
 - Father
 - Other (please specify):
- 20) How attached were you to this pet?
- Extremely attached
 - Somewhat attached
 - Not very attached
 - Not at all attached
- 21) What happened to this pet?
- Died
 - Ran away
 - Gave it away (please give reason):
 - Other (please explain):

Appendix A6

Pet Preference Inventory

Think about each animal on the list and consider whether or not you would like that animal for a pet. Even if you already have a pet, fill in your most honest answer. Circle the number that matches how you feel about each pet.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1) I would love to have a cat.	5	4	3	2	1
2) I would love to have a horse.	5	4	3	2	1
3) I would love to have a fish.	5	4	3	2	1
4) I would love to have a dog.	5	4	3	2	1
5) I would love to have a bird.	5	4	3	2	1
6) I would love to have a reptile/ amphibian.	5	4	3	2	1
7) I would love to have a rodent.	5	4	3	2	1

Appendix A7

Questionnaire Measure of Emotional Empathy (QMEE)
(Mehrabian & Epstein, 1972)

	Strongly Agree	Agree	Disagree	Strongly Disagree
1) It makes me sad to see a lonely stranger in a group.	4	3	2	1
2) People make too much of the feelings and sensitivity of animals.	4	3	2	1
3) I often find public displays of affection annoying.	4	3	2	1
4) I am annoyed by unhappy people who are just sorry for themselves.	4	3	2	1
5) I become nervous if others around me seem to be nervous.	4	3	2	1
6) I find it silly for people to cry out of happiness.	4	3	2	1
7) I tend to get emotionally involved with a friend's problems.	4	3	2	1
8) Sometimes the words of a love song can move me deeply.	4	3	2	1
9) I tend to lose control when I am bringing bringing bad news to people.	4	3	2	1
10) The people around me have a great influence on my moods.	4	3	2	1
11) Most foreigners I have met seemed cool and unemotional.	4	3	2	1
12) I would rather be a social worker than work in a job training center.	4	3	2	1
13) I don't get upset just because a friend is acting upset.	4	3	2	1
14) I like to watch people open presents.	4	3	2	1

	Strongly Agree	Agree	Disagree	Strongly Disagree
15) Lonely people are probably unfriendly.	4	3	2	1
16) Seeing people cry upsets me.	4	3	2	1
17) Some songs make me happy.	4	3	2	1
18) I really get involved with the feelings of a character in a novel.	4	3	2	1
19) I get very angry when I see someone being ill-treated.	4	3	2	1
20) I am able to remain calm even though those around me worry.	4	3	2	1
21) When a friend starts to talk about his/her problems, I try to steer the conversation to something else.	4	3	2	1
22) Another's laughter is not catching for me.	4	3	2	1
23) Sometimes at the movies I am amused by the amount of crying and sniffing around me.	4	3	2	1
24) I am able to make decisions without being influenced by other people's feelings.	4	3	2	1
25) I cannot continue to feel okay if people around me are depressed.	4	3	2	1
26) It is hard for me to see how some things upset people so much.	4	3	2	1
27) I am very upset when I see an animal in pain.	4	3	2	1
28) Becoming involved in books or movies is a little silly.	4	3	2	1
29) It upsets me to see helpless old people.	4	3	2	1
30) I become more irritated than sympathetic when I see someone's tears.	4	3	2	1
31) I become very involved when I watch a movie,	4	3	2	1

	Strongly Agree	Agree	Disagree	Strongly Disagree
32) I often find that I can remain cool in spite of the excitement around me.	4	3	2	1
33) Little children sometimes cry for no apparent reason	4	3	2	1



(Beth Daly)

(Beth Daly)

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Appendix A8

SONSO Personality Inventory

Rate yourself on each of the following descriptive words by circling one of the five numbers after each word. Work rapidly. Guess if you have to, but ensure that you circle one number for each word.

	Strongly describes me	Describes me	Neutral	Does not describe me	Strongly does not describe me		Strongly describes me	Describes me	Neutral	Does not describe me	Strongly do describe
1) CREATIVE	5	4	3	2	1	13) NERVOUS	5	4	3	2	1
2) TROUBLED	5	4	3	2	1	14) RESPONSIBLE	5	4	3	2	1
3) SHY	5	4	3	2	1	15) TENDER	5	4	3	2	1
4) THOROUGH	5	4	3	2	1	16) RECLUSIVE	5	4	3	2	1
5) WARM	5	4	3	2	1	17) IMAGINATIVE	5	4	3	2	1
5) INSIGHTFUL	5	4	3	2	1	18) FRUSTRATED	5	4	3	2	1
7) SOLEMN	5	4	3	2	1	19) ORGANIZED	5	4	3	2	1
3) PRACTICAL	5	4	3	2	1	20) UNDERSTANDING	5	4	3	2	1
3) TENSE	5	4	3	2	1	21) INQUISITIVE	5	4	3	2	1
10) INDIVIDUALISTIC	5	4	3	2	1	22) TEMPERMENTAL	5	4	3	2	1
11) KIND	5	4	3	2	1	23) PROMPT	5	4	3	2	1
12) QUIET	5	4	3	2	1	24) UNASSERTIVE	5	4	3	2	1

	Strongly describes me	Describes me	Neutral	Does not describe me	Strongly does not describe me		Strongly describes me	Describes me	Neutral	Does not describe me	Strongly do describe
25) PLEASANT	5	4	3	2	1	42) UNEASY	5	4	3	2	1
26) INVENTIVE	5	4	3	2	1	43) ORIGINAL	5	4	3	2	1
27) WORRYING	5	4	3	2	1	44) SYMPATHETIC	5	4	3	2	1
28) EFFICIENT	5	4	3	2	1	45) ORDERLY	5	4	3	2	1
29) BASHFUL	5	4	3	2	1	46) MILD	5	4	3	2	1
30) COMPASSIONATE	5	4	3	2	1	47) PHILOSOPHICAL	5	4	3	2	1
31) ARTISTIC	5	4	3	2	1	48) MOODY	5	4	3	2	1
32) DEPRESSED	5	4	3	2	1	49) PRECISE	5	4	3	2	1
33) RESERVED	5	4	3	2	1	50) NICE	5	4	3	2	1
34) GENTLE	5	4	3	2	1						
35) SYSTEMATIC	5	4	3	2	1						
36) UNCONVENTIONAL	5	4	3	2	1						
37) SILENT	5	4	3	2	1						
38) IRRITABLE	5	4	3	2	1						
39) DILIGENT	5	4	3	2	1						
40) SOFT-HEARTED	5	4	3	2	1						
41) SOLITARY	5	4	3	2	1						

APPENDIX B: Pearson Product Moment Correlation Coefficients for the Aspects of Empathy

Table B1

Pearson Product Moment Correlation Coefficients for the QMEE Literary Aspect of Empathy and the nine variables in the Dispositional Cluster

	1	2	3	4	5	6	7	8	9	10
1. Literary Empathy	1	-.14**	.10*	.05	.40**	.30**	-.03	-.70	.06	-.06
2. SONSO Shyness	-.14**	1	.03	.46**	.03	-.20**	-.04	-.11*	.04	.29**
3. SONSO Organization	.10*	.03	1	-.01	.24**	.06	-.14**	-.12*	-.10*	-.08
4. SONSO Nervousness	.05	.46**	-.01	1	-.09	.00	.19**	.23**	.32**	.51**
5. SONSO Sympathy	.40**	.03	.24**	-.09	1	.16**	-.26**	-.17**	-.12*	-.10*
6. SONSO Originality	.30**	-.20**	.06	.00	.16**	1	.08	.20**	.07	-.06
7. AQ Physical Aggression	-.03	-.04	-.14**	.19**	-.26**	.08	1	.48**	.54**	.45**
8. AQ Verbal Aggression	.07	-.11*	-.12*	.23**	-.17**	.21**	.48**	1	.53**	.38**
9. AQ Anger	.06	.04	.10*	.32**	-.12*	.07	.54**	.53**	1	.53**
10. AQ Hostility	-.06	.29**	-.08	.51**	-.10*	-.06	.45**	.38**	.53**	1

* $p < .05$ ** $p < .01$

Table B2
 Pearson Product Moment Correlation Coefficients for the QMEE Interpersonal Aspect of Empathy and the nine Variables in the Dispositional Cluster

	1	2	3	4	5	6	7	8	9	10
1. Interpersonal Empathy	1	.26**	-.02	.33**	.16**	-.15**	-.05	-.06	.11*	.23**
2. SONSO Shyness	.26**	1	.03	.46**	.03	-.20**	-.04	.11*	.04	.29**
3. SONSO Organization	-.02	.03	1	-.01	.24**	.06	-.14**	-.12*	-.10*	-.08
4. SONSO Nervousness	.33**	.46**	-.01	1	-.09	.00	.19**	.23**	.32**	.51**
5. SONSO Sympathy	.16**	.03	.24**	-.09	1	.16**	-.26**	-.17**	.12*	-.10*
6. SONSO Originality	-.15**	-.20**	.06	.00	.16**	1	.08	.20**	.07	-.06
7. AQ Physical Aggression	-.05	-.04	-.14**	.19**	-.26	.08	1	.48**	.54**	.45**
8. AQ Verbal Aggression	-.06	-.11*	-.12*	.23**	-.17**	.20**	.48**	1	.53**	.38**
9. AQ Anger	.11*	.04	-.10*	.32*	-.12*	.07	.54**	.53**	1	.53**
10. AQ Hostility	.23**	.29**	-.08	.51**	-.10*	-.06	.45**	.38**	.53**	1

* $p < .05$ ** $p < .01$

Table B3

Pearson Product Moment Correlation Coefficients for the QMEE Susceptible Aspect of Empathy and the nine Variables in the Dispositional Cluster

	1	2	3	4	5	6	7	8	9	10
1. Susceptible Empathy	1	-.08	.05	.04	.45**	.12*	-.08	-.01	-.03	-.04
2. SONSO Shyness	.08	1	.03	.46**	.03	-.20**	-.04	-.11*	.04	.29**
3. SONSO Organization	.05	.03	1	-.01	.24**	.06	-.14**	-.12*	-.10	-.08
4. SONSO Nervousness	.04	.46**	-.01	1	-.09	.00	.19**	.23**	.32**	.51**
5. SONSO Sympathy	.45**	.03	.24**	-.09	1	.16**	-.26**	-.17**	-.12*	-.10*
6. SONSO Originality	.12*	-.20**	.06	.00	.16**	1	.09	.20**	.07	-.06
7. AQ Physical Aggression	-.08	-.04	-.14**	.19**	-.26**	.08	1	.48**	.54**	.45**
8. AQ Verbal Aggression	-.01	-.11*	-.12*	.23**	-.17**	.20**	.48**	1	.53**	.38**
9. AQ Anger	-.03	.04	-.10*	.32**	-.12*	.07	.54**	.53**	1	.53**
10. AQ Hostility	-.04	.29**	-.08	.51**	-.10*	-.06	.45**	.38**	.53**	1

* $p < .05$ ** $p < .01$

Table B4
 Pearson Product Moment Correlation Coefficients for the QMEE Controlled Aspect of Empathy and the nine Variables in the Dispositional Cluster

	1	2	3	4	5	6	7	8	9	10
1. Controlled Empathy	1	-.08	.10*	.04	.38**	-.05	-.22*	-.09	-.07	-.03
2. SONSO Shyness	-.08	1	.03	.46**	.03	-.20**	-.04	-.11*	.04	.30**
3. SONSO Organization	.10*	.03	1	-.01	.24**	.06	-.14**	-.12*	-.10*	-.08
4. SONSO Nervousness	.04	.04	-.01	1	-.09	.00	.19**	.23**	.32**	.51**
5. SONSO Sympathy	.38**	.38**	.24**	-.09	1	.16**	-.26**	-.17**	.12*	-.10*
6. SONSO Originality	.05	.05	.06	.00	.16**	1	.08	.20**	.07	-.06
7. AQ Physical Aggression	-.22**	-.22**	-.14**	.19**	-.26**	.08	1	.48**	.54**	.45**
8. AQ Verbal Aggression	-.09	.09	-.12*	.23**	-.17**	.20**	.48**	1	.53**	.38**
9. AQ Anger	-.07	-.07	-.10*	.32**	-.12*	.07	.54**	.53**	1	.53**
10. AQ Hostility	-.03	-.03	-.08	.51**	-.10*	-.06	.45**	.38**	.53**	1

* $p < .05$ ** $p < .01$

Table B5
 Pearson Product Moment Correlation Coefficients for the QMEE Compassionate Aspect of Empathy and the nine Variables in the Dispositional Cluster

	1	2	3	4	5	6	7	8	9	10
1. Compassionate Empathy	1	.07	.10*	.06	.42**	.10	-.09	-.06	.00	-.04
2. SONSO Shyness	.07	1	.03	.46**	.03	-.20**	-.04	-.11*	.04	.29**
3. SONSO Organization	.10*	.03	1	-.01	.24**	.06	-.14**	-.12*	-.10*	-.08
4. SONSO Nervousness	.06	.46**	-.01	1	-.10	.00	.19**	.23**	.32	.51
5. SONSO Sympathy	.42**	.03	.24**	-.10	1	.16**	.26**	.17**	-.12*	-.10*
6. SONSO Originality	.10	-.20**	.06	.00	.16**	1	.08	.20**	.07	-.10
7. AQ Physical Aggression	-.10	-.04	-.14**	.19**	-.26**	.08	1	.48**	.54**	.45**
8. AQ Verbal Aggression	-.06	-.11*	-.12	.23**	-.17**	.20**	.48**	1	.53**	.38**
9. AQ Anger	.00	.04	-.10*	.32**	-.12*	.07	.54**	.53**	1	.53**
10. AQ Hostility	-.04	.30**	-.08	.51**	-.10*	.06	.45**	.38**	.53*	1

* $p < .05$ ** $p < .01$

Table B6
 Pearson Product Moment Correlation Coefficients for the QMEE Animal Aspect of Empathy and the nine Variables in the Dispositional Cluster

	1	2	3	4	5	6	7	8	9	10
1. Animal Empathy	1	-.05	.01	.00	.25**	.08	-.12*	-.04	-.06	-.02
2. SONSO Shyness	-.05	1	.03	.46**	.03	-.20**	-.04	-.11*	.04	.30**
3. SONSO Organization	.01	.03	1	.01	.24**	.06	-.14**	-.12*	-.10*	-.08
4. SONSO Nervousness	.00	.46**	-.01	1	-.09	.00	.19**	.23**	.32**	.51**
5. SONSO Sympathy	.25**	.03	.24**	-.09	1	.16**	-.26**	-.17**	-.12*	-.10*
6. SONSO Originality	.08	-.20**	.06	.00	-.16**	1	.08	.20**	.07	-.06
7. AQ Physical Aggression	-.12*	-.04	-.14**	.19**	-.26**	.08	1	.48**	.54**	.45**
8. AQ Verbal Aggression	-.04	-.11*	-.12*	.23**	-.17**	.20**	.48**	1	.53**	.38**
9. AQ Anger	-.06	.04	-.10*	.32**	-.12*	.07	.54**	.53**	1	.53**
10. AQ Hostility	-.02	.29**	-.08	.51**	-.10*	-.06	.45**	.38**	.53**	1

* $p < .05$ ** $p < .01$

Table B7

Pearson Product Moment Correlation Coefficients for QMEE Literary Aspect of Empathy and the Twelve Variables in the Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Literary Empathic	1	.29**	-.02	.07	-.01	.05	-.02	-.08	-.01	-.05	-.03	-.02	-.0
2. Sex	.29**	1	-.13**	-.06	-.02	.06	.06	-.05	.03	.00	-.02	-.02	-.0
3. Age	-.02	-.13**	1	.38**	.35*	.03	.19**	.21**	-.17**	-.08	.19**	-.14**	.0
4. Education	-.07	-.06	.38**	1	.16**	.01	.07	.04	-.08	-.03	.06	-.08	-.0
5. Children under 18	-.01	-.02	.35**	.16**	1	.10*	.23**	.08	-.09	-.04	.10*	-.07	-.0
6. Annual Income	.05	.06	.03	.01	.10*	1	.00	-.11*	.03	-.04	-.08	-.05	-.0
7. Number of siblings	-.02	.06	.19**	.07	.23**	.00	1	.09	-.02	.09	.03	-.07	-.0
8. Perceived fin. status	-.08	-.05	.21**	.04	.08	-.11*	.09	1	-.10*	.03	.31**	-.02	.28*
9. Always lived with pets	-.01	.03	-.17**	-.08	-.09	.03	-.02	-.10*	1	-.03	-.08	.08	.0
10. Grew up with pets	-.05	.00	-.08	-.03	-.04	-.04	.01	.03	-.03	1	.05	.03	.0
11. Humanistic Discipline	-.03	-.02	.19**	.06	.10*	-.08	.03	.31**	-.08	.05	1	.000	.0
12. Strict Discipline	.02	-.02	-.14**	-.08	0.07	-.05	-.07	-.02	.08	.03	.000	1	.1
13. Parents' Marital Status	-.06	-.04	-.03	-.07	-.05	-.06	-.01	.28**	.01	.05	.03	.11*	

* $p < .05$ ** $p < .01$

Table B8
 Pearson Product Moment Correlation Coefficients for the QMEE Interpersonal Aspect of Empathy and the Twelve Variables in the Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Interpersonal Empathic	1	.21**	-.05	-.02	.00	-.06	-.00	-.01	.01	.06	-.01	.03	-.10*
2. Sex	.21**	1	-.13**	-.06	-.02	.06	.06	-.05	.03	.00	-.02	-.02	.04
3. Age	-.05	-.13**	1	.38**	.35**	.03	.20**	.21**	-.17**	-.08	.19**	-.14**	-.03
4. Education	-.02	0.06	.38**	1	.16*	.01	.07	.04	-.08	-.03	.06	-.08	-.07
5. Children under 18	.00	-.02	.35**	.16**	1	.10*	.23**	.08	-.09	-.04	.10*	-.07	-.05
6. Annual Income	-.06	.06	.03	.01	.10*	1	.00	-.11*	.03	-.04	-.08	-.05	-.06
7. Number of Siblings	-.00	.06	.19**	.07	.23**	.00	1	.09	-.02	.01	.03	-.07	-.01
8. Perceived fin. status	-.01	-.05	.21**	.04	.08	-.11*	.09	1	-.10*	.03	.31**	-.02	.28**
9. Always lived with pets	.01	.03	-.17**	-.08	-.09	.03	-.02	-.10*	1	-.03	-.08	.08	.01
10. "Grew up with pets"	.06	.00	-.08	-.03	-.04	-.04	.01	.03	-.03	1	.05	.03	.05
11. Humanistic Disc.	-.01	-.02	.19**	.06	.10*	-.08	.03	.31**	.08	.05	1	1.00	.03
12. Strict Discipline	.03	-.02	-.14**	-.08	.07	-.05	-.07	0.02	.08	.03	.00	1	.11*
13. Parent's mar. status	-.10*	-.04	-.03	-.07	-.05	-.06	-.01	.28**	.01	.05	.03	.11*	1

* $p < .05$ ** $p < .01$

Table B9
Pearson Product Moment Correlation Coefficients for the QMEE Susceptible Aspect of Empathy and the Twelve Variables in the Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Susceptible Empathy	1	.35**	-.15**	-.10	.00	.08	-.06	-.07	.08	-.03	-.02	.02	-.06
2. Sex	.35**	1	-.13**	-.06	-.02	.06	.06	-.05	-.03	.00	-.02	-.02	-.04
3. Age	-.15**	-.13**	1	.38**	.35**	.03	.18**	.21**	-.17**	-.18	.19**	-.14**	-.03
4. Education	-.10	-.06	.38**	1	.16**	.01	.07	.04	-.08	-.03	.06	-.08	-.07
5. Children under 18	.00	-.02	.35**	.16**	1	.10*	.23**	.08	-.09	-.04	.10*	-.07	-.05
6. Annual Income	.08	.06	.03	.01	.10*	1	.00	-.11*	.03	-.04	0.08	-.05	-.06
7. Number of Siblings	-.06	.06	.20**	.07	.23**	.00	1	.09	-.02	.01	.03	-.07	-.01
8. Perceived fin. status	-.07	-.05	.21**	.04	.08	-.11*	.09	1	-.10*	.03	.31**	-.02	.8**
9. Always lived with pets	.08	.03	-.17**	-.08	-.09	.03	-.02	-.10*	1	-.03	-.08	.08	.01
10. Grew up with pets	-.03	.00	-.08	-.03	-.04	-.04	.01	.03	-.03	1	.05	.03	.05
11. Humanistic	-.02	-.02	.19**	.06	.10*	-.08	.03	.31**	-.08	.05	1	.00	.03
12. Strict Discipline	.02	-.02	-.14**	-.08	-.07	-.05	-.07	-.02	.08	.03	.00	1	.11*
13. Parent's marital status	-.06	-.04	-.03	-.07	-.05	-.06	0.01	.28**	.01	.05	.03	.11*	1

* $p < .05$ ** $p < .01$

Table B10
 Pearson Product Moment Correlation Coefficients for the QMEE Controlled Aspect of Empathy and the Twelve Variables in the Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Controlled Empathy	1	.44**	-.06	.08	-.01	.03	.02	-.09	-.01	-.02	-.09	-.05	-.04
2. Sex	.44**	1	-.13**	-.06	-.02	.06	.06	-.05	.03	.00	-.02	-.02	-.04
3. Age	-.06	-.13**	1	.38**	.35**	.03	.19**	.21**	-.17**	-.08	.19**	-.14**	-.03
4. Education	-.08	-.06	.38**	1	.16**	.01	.07	.04	-.08	-.03	.06	-.08	-.07
5. Children under 18	-.01	-.02	.35**	.16**	1	.10*	.23**	.08	-.09	-.04	.10*	-.07	-.05
6. Annual Income	.03	.06	.03	.01	.10*	1	.00	-.11*	.03	-.04	-.08	-.05	-.06
7. Number of Siblings	.02	.06	.19**	.07	.23**	.00	1	.09	-.02	.01	.03	-.07	.01
8. Perceived financial status	-.09	-.05	.21**	.04	.08	-.11*	.09	1	.10*	.03	.31**	-.02	.28**
9. Always lived with pets	-.01	.03	-.17**	-.08	-.09	.03	-.02	-.10*	1	-.03	-.08	.08	.01
10. Grew up with pets	-.02	.00	-.08	-.03	-.04	-.04	.01	.03	-.03	1	.05	.03	.05
11. Humanistic	-.09	-.02	.19**	.06	.10*	-.08	.03	.31**	-.08	.05	1	.00	.03
12. Strict Discipline	-.05	-.02	.14**	-.08	-.07	-.05	-.07	-.02	.08	.03	.00	1	.11*
13. Parents' mar. status	-.04	-.04	-.03	-.07	-.05	-.06	-.01	.28**	.01	.05	.03	.11*	1

* $p < .05$ ** $p < .01$

Table B11
 Pearson Product Moment Correlation Coefficients for QMEE Compassionate Aspect of Empathy and the Twelve Variables in the QMEE Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Compassionate Empathy	1	.35**	-.06	-.01	-.02	-.05	-.01	-.06	.05	-.01	.03	.01	-.14**
2. Sex	.35**	1	-.13**	-.06	-.02	.06	.06	0.05	.03	.00	-.02	-.02	-.04
3. Age	-.06	-.13**	1	.38**	.35**	.03	.19**	.21**	-.17**	-.08	.19**	-.14**	-.03
4. Education	-.01	-.06	.38**	1	.16**	.01	.07	.04	-.08	-.03	.06	-.08	-.07
5. Children under 18	-.02	-.02	.35**	.16**	1	.10*	.23**	.08	-.09	-.05	.10*	-.07	-.05
6. Annual Income	.05	.06	.03	.01	.10*	1	.00	-.11*	.03	-.04	-.08	-.05	.06
7. Number of Siblings	-.01	.06	.19**	.07	.23**	.00	1	.09	-.02	.01	.03	-.07	-.01
8. Perceived fin. status	-.06	-.05	.21**	.04	.08	-.11*	.09	1	-.10*	.03	.31**	-.02	.28**
9. Always lived with pets	.05	.03	-.17**	-.08	-.09	.03	-.02	-.10*	1	-.03	-.08	.08	.01
10. Grew up with pets	-.01	.00	-.08	-.13	-.04	-.04	.01	.03	-.03	1	.05	.03	.05
11. Humanistic	-.03	-.02	.19**	.06	.10*	-.08	.03	.31**	-.08	.05	1	.00	.03
12. Strict Discipline	.01	-.02	-.14**	-.08	-.07	-.05	-.07	-.02	.08	.03	.00	1	.11*
13. Parent's mar. status	-.14*	-.04	-.03	-.07	-.05	-.06	-.01	.28**	.01	.05	.03	.11*	1

* $p < .05$ ** $p < .01$

Table B12
 Pearson Product Moment Correlation Coefficients for the QMEE Animal Aspect of Empathy and the Twelve Variables in the Situational Cluster

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Animal Empathy	1	.21**	-.12*	-.09	-.18**	-.03	-.09	-.01	.34**	.08	.01	.00	.02
2. Sex	.21**	1	-.13**	-.06	-.02	-.06	.06	-.05	.03	.00	-.02	-.02	-.04
3. Age	-.12*	-.13**	1	.38**	.35**	.03	.19**	.21**	-.17**	-.08	.19**	-.14**	-.03
4. Education	-.09	-.06	.38**	1	.16**	.01	.07	.04	-.08	-.03	.06	.08	-.07
5. Children under 18	-.18**	-.02	.35**	.16**	1	.10*	.23**	.08	-.09	-.04	.10*	-.07	-.05
6. Annual Income	-.03	.06	.03	.01	.10*	1	.00	-.11*	.03	-.04	-.08	-.05	-.06
7. Number of Siblings	-.10	.06	.19**	.07	.23**	.00	1	.09	-.02	.01	.03	-.07	-.01
8. Perceived financial status	-.01	-.05	.21**	.04	.08	-.11*	.09	1	-.10*	.03	.31**	-.02	.28**
9. Always lived with pets	.34**	.03	.17**	-.08	-.09	.03	-.02	-.10*	1	-.03	-.08	.08	.01
10. Grew up with pets	.08	.00	-.08	-.03	-.04	-.04	.01	.03	.03	1	.05	.03	.05
11. Humanistic Disc.	.01	-.02	.19**	.06	.10*	-.08	.03	.31**	-.08	-.05	1	.00	.03
12. Strict Discipline	.00	-.02	-.14**	.08	-.07	-.05	-.07	-.02	.08	.03	.00	1	.11*
13. Parent's marital stat.	.02	-.04	-.03	-.07	.05	-.06	-.01	.28**	.01	.05	.03	.11*	1

* $p < .05$ ** $p < .01$



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Table B13
 Pearson Product Moment Correlation Coefficients for QMEE Literary Aspect of Empathy and the Seven
 Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. Literary Empathy	1	.07	.15**	.03	.16**	.21**	.01	.09
2. PP1 Would Love a Cat	.07	1	.23**	.17**	.10*	.32**	-.33**	.02
3. PP2 Would Love a Horse	.15*	.23**	1	.25**	.31**	.32**	-.05	-.01
4. PP3 Would Love a Fish	.03	.17**	.25**	1	.15**	.09	-.08	.05
5. PP4 Would Love a Dog	.16**	.10*	.31**	.15**	1	.51**	-.44**	.10*
6. PAS Lover of Pets	.21**	.32**	.32**	.09	.51**	1	.01	.00
7. PAS Avoider of Pets	-.01	-.17**	-.05	.08	.44**	.01	1	.00
8. PAS Humanizer of Pets	.09	.15**	.12*	.05	.10*	.00	.00	1

* $p < .05$ ** $p < .01$

Table B14

Pearson Product Moment Correlation Coefficients for the QMEE Interpersonal Aspect of Empathy and the Seven Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. Interpersonal Empathy	1	.16**	.02	.07	.03	.01	-.08	.17**
2. PP1 Would Love a Cat	.16**	1	.23**	.17**	.10*	.32**	-.17**	.15**
3. PP2 Would Love a Horse	.01	.23**	1	.25**	.31**	.32**	-.05	.12*
4. PP3 Would Love a Fish	.07	.17**	.25**	1	.15**	.09	-.08	.05
5. PP4 Would Love a Dog	.03	.10*	.31**	.15**	1	.51**	-.44**	.10*
6. PAS Lover of Pets	.01	.32**	.32**	.09	.51**	1	.01	.00
7. PAS Avider of Pets	-.08	-.17**	-.05	.08	-.44**	.01	1	.00
8. PAS Humanizers of Pets	.17**	.15**	.12*	.05	.10*	.00	.00	1

* $p < .05$ ** $p < .01$

Table B15

Pearson Product Moment Correlation Coefficients for the QMEE Susceptible Aspect of Empathy and the Seven Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. Susceptible Empathy	1	.14**	.17**	-.01	.19**	.19**	-.14**	-.01
2. PP1 Would Love a Cat	.14**	1	.23**	.17**	.10*	.32**	-.17**	.15**
3. PP2 Would Love a Horse	.17**	.23**	.25**	1	.31**	.32**	-.05	.12*
4. PP3 Would Love a Fish	-.01	.17**	.25**	1	.15**	.09	-.08	.05
5. PP4 Would Love a Dog	.19**	.10*	.31**	.15**	1	.51**	-.44**	.10*
6. PAS Lover of Pets	.19**	.32**	.32**	.09	.51**	1	.01	.00
7. PAS Avider of Pets	-.14**	-.17**	-.05	-.08	-.44**	.09	1	.00
8. PAS Humanizer of Pets	-.01	.15**	.12*	.05	.10*	.00	.00	1

* $p < .05$ ** $p < .01$

Table B16

Pearson Product Moment Correlation Coefficients for the QMEE Controlled Aspect of Empathy and the Seven Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. Controlled Empathy	1	.13**	.18*	.03	.18**	.11*	-.30**	.06
2. PP1 Would Love a Cat	.13**	1	.23*	.17**	.10*	.32**	-.17**	.15**
3. PP2 Would Love a Horse	.18**	.23**	1	.2**	.31**	.32**	-.05	.12*
4. PP3 Would Love a Fish	.03	.17**	.25**	1	.15**	.09	-.08	.05
5. PP4 Would Love a Dog	.18**	.10*	.31**	.15**	1	.51**	-.44**	.10*
6. PAS Lovers of Pets	.11*	.32**	.32**	.09	.51**	1	.01	.00
7. PAS Avoiders of Pets	-.25**	-.17**	-.05	-.08	-.44**	.01	1	.00
8. PAS Humanizers of Pets	.06	.15**	.12*	.05	.10*	.00	.00	1

* $p < .05$ ** $p < .01$

Table B17

Pearson Product Moment Correlation Coefficients for the QMEE Compassionate Aspect of Empathy and the Seven Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. Compassionate Empathy	1	.15**	.23**	.02	.14**	.21**	-.05	.10
2. PP1 Would Love a Cat	.15**	1	.23*	.17**	.10*	.32**	-.17**	.15**
3. PP2 Would Love a Horse	.23**	.23**	1	.25**	.31**	.32**	-.05	.12*
4. PP3 Would Love a Fish	.02	.17**	.25**	1	.15**	.08	-.08	.05
5. PP4 Would Love a Dog	.14**	.10*	.31**	.15**	1	.51	-.44**	.10*
6. PAS Lovers of Pets	-.21*	.10*	.32**	.09	.51**	1	.01	.00
7. PAS Avoiders of Pets	-.50	-.17**	-.05	-.08	-.44**	.01	1	.00
8. PAS Humanizers of Pets	.10	.15**	.12*	.05	.10*	.00	.00	1

* $p < .05$ ** $p < .01$

Table B18

Pearson Product Moment Correlation Coefficients for the QMEE Animal Aspect of Empathy and the Seven Variables in the Biophilial Cluster

	1	2	3	4	5	6	7	8
1. Animal Empathy	1	.27**	.21**	.02	.43**	.42**	-.46**	.32**
2. PP1 Would Love a Cat	.27**	1	.23**	.17**	.10*	.32**		
3. PP2 Would Love a Horse	.21**	.23**	1	.25**	.31**	.32**	-.05	.12*
4. PP3 Would Love a Fish	.02	.17**	.25**	1	.15**	.09	-.08	.05
5. PP4 Would Love a Dog	.43**	.10*	.31**	.15**	1	.51**	-.44**	.10*
6. PAS Lovers of Pets	.42**	.32**	.32**	.09	.51**	1	.01	.00
7. PAS Avoiders of Pets	-.46**	-.17**	-.05	.08	-.44**	.01	1	.00
8. PAS Humanizers of Pets	.32**	.15**	.12*	.05	.10*	.00	.00	1

* $p < .05$ ** $p < .01$

APPENDIX C: Forward Regressions of the Aspects of Empathy

Table C1
Forward Regression of the QMEE Total Score

Variable	Beta	T-Score	p-value	Step
SONSO Sympathy	.385	8.30	<.001	1
SONSO Nervousness	.156	3.23	<.001	4
SONSO Shyness	-.097	-2.00	<.05	6
SONSO Originality	.032	.71	>.05	
AQ Physical Aggression	-.033	-.70	>.05	
AQ Anger	.020	.43	>.05	
AQ Hostility	-.021	.41	>.05	
Would Love a Cat	.003	.08	>.05	
Would Love a Horse	-.013	-.30	.77	
Would Love a Dog	.005	.10	.92	
PAS Lover of Pets	.174	3.97	<.001	3
Avoider of Pets	-.093	-.21	<.05	5
Humanizer of Pets	.067	1.55	>.05	
Sex	.320	7.00	<.001	2
Age	-.020	-.45	>.05	
Children under 18	.076	1.74	>.05	
Always Lived with Pets	-.054	-1.14	>.05	
Parents' Marital Status	-.050	-1.16	>.05	

Table C2
Forward Regression of the Literary Aspect

Variable	Beta	T-Score	p-value	Step
SONSO Sympathy	.325	6.39	<.001	1
SONSO Nervousness	.078	1.41	>.05	
SONSO Shyness	-.129	-2.74	<.01	5
SONSO Originality	.179	3.70	<.001	2
AQ Physical Aggress. Aggression	.101	2.07	<.01	6
AQ Anger	.056	1.02	>.05	
AQ Hostility	.004	.08	>.05	
Would Love a Cat	-.046	-.95	>.05	
Would Love a Horse	-.013	-.28	>.05	
Would Love a Dog	.037	.73	.46	
PAS Lover of Pets	.124	2.70	<.01	4
PAS Avider of Pets	.058	1.22	>.05	
PAS Humanizer of Pets	.078	1.67	>.05	
Sex	.222	4.52	<.001	3
Age	-.015	-.32	>.05	
Children under 18 in residence	.013	.281	>.05	
Always Lived with Pets	-.082	-1.73	>.05	
Parents' Marital Status	-.034	-.73	>.05	

Table C3
Forward Regression of the Interpersonal Aspect

Variable	Beta	t-Score	p-value	Step
SONSO Sympathy	.190	3.72	<.001	2
SONSO Nervousness	.324	6.67	<.001	1
SONSO Shyness	.069	1.23	>.05	
SONSO Originality	-.179	-2.70	<.001	3
AQ Physical Aggression	.010	.19	>.05	
AQ Anger	.041	.80	>.05	
AQ Hostility	.095	1.69	>.05	
Would Love a Cat	.088	1.81	>.05	
Would Love a Horse	-.032	-.65	>.05	
Would Love a Dog	.003	.06	>.05	
PAS Lover of Pets	.011	.22	>.05	
PAS Avoider of Pets	-.052	-1.07	>.05	
PAS Humanizer of Pets	.117	2.41	<.05	5
Sex	.127	2.50	<.05	4
Age	-.013	-.27	>.05	
Children under 18	.024	.50	>.05	
Always Lived with Pets	.039	.81	>.05	
Parents' Marital Status	-.081	-1.68	>.05	

Variable	Beta	T-Score	p-value	Step
SONSO Sympathy	.368	7.59	<.001	1
SONSO Nervousness	.044	.85	>.05	
SONSO Shyness	-.090	-1.97	.05	6
SONSO Originality	.021	.44	>.05	
AQ Physical Aggression	.085	1.76	>.05	
AQ Anger	.043	.94	>.05	
AQ Hostility	.042	.88	>.05	
Would Love a Cat	.003	.07	>.05	
Would Love a Horse	-.003	-.06	>.05	
Would Love a Dog	.013	.26	>.05	
PAS Lover of Pets	.114	2.41	<.01	4
PAS Avoider of Pets	.007	.15	>.05	
PAS Humanizer of Pets	-.064	-1.37	.17	
Sex	.252	5.25	<.001	2
Age	-.151	-3.04	<.001	3
Children under 18	.117	2.35	<.05	5
Always Lived with Pets	-.021	-.44	>.05	
Parents' Marital Status	-.016	-.35	>.05	

Table C4

Forward Regression of the Susceptible Aspect

Table C5
Forward Regression of the Controlled Aspect

Variable	Beta	T-Score	p-value	Step
SONSO Sympathy	.264	5.46	<.001	2
SONSO Nervousness	.027	.58	>.05	
SONSO Shyness	-.078	-1.70	>.05	
SONSO Originality	.019	.58	>.05	
AQ Physical Aggression	-.022	-.46	>.05	
AQ Anger	.004	.08	>.05	
AQ Hostility	.001	.030	>.05	
Would Love a Cat	.013	.29	>.05	
Would Love a Horse	.058	1.25	>.05	
Would Love a Dog	.001	.017	>.05	
PAS Lover of Pets	.057	1.24	>.05	
PAS Avoider of Pets	-.158	-3.41	<.001	3
PAS Humanizer of Pets	-.023	-.50	>.05	
Sex	.338	7.04	<.001	1
Age	.022	.46	>.05	
Children under 18	.043	.93	>.05	
Always Lived with Pets	-.074	-1.51	>.05	
Parents' Marital Status	-.016	-.34	>.05	

Table C6
Forward Regression of the Compassionate Aspect

Variable	Beta	T-Score	p-value	Step
SONSO Sympathy	.336	6.63	<.001	1
SONSO Nervousness	.025	.52	>.05	
SONSO Shyness	.039	.82	>.05	
SONSO Originality	.028	.58	.56	
AQ Physical Aggression	.050	.10	>.05	
AQ Anger	.027	.57	>.05	
AQ Hostility	-.029	-.61	>.05	
Would Love a Cat	.032	.65	>.05	
Would Love a Horse	.045	.89	>.05	
Would Love a Dog	-.002	-.03	>.05	
PAS Lover of Pets	.103	2.12	.04	3
PAS Avoider of Pets	.061	1.26	>.05	
PAS Humanizer of Pets	.052	1.10	>.05	
Sex	.263	5.26	<.001	2
Age	-.013	-.27	>.05	
Children under 18 in residence	.004	.09	>.05	
Always Lived with Pets	-.018	-.37	>.05	
Parents' Marital Status	-.093	-1.94	>.05	

Table C7
Forward Regression of the Animal Aspect

Variable	Beta	T-Score	p-value	Step
SONSO Sympathy	.128	3.39	<.001	4
SONSO Nervousness	-.047	-1.24	>.05	
SONSO Shyness	-.061	-1.63	>.05	
SONSO Originality	.013	.35	>.05	
AQ Physical Aggression	-.032	-.83	>.05	
AQ Anger	-.030	-.78	>.05	
AQ Hostility	-.06	-1.63	>.05	
Would Love a Cat	-.015	-.38	>.05	
Would Love a Horse	-.07	-1.73	>.05	
Would Love a Dog	-.002	-.04	>.05	
PAS Lover of Pets	.377	9.86	<.001	2
PAS Avoider of Pets	-.422	-10.50	<.001	1
PAS Humanizer of Pets	.310	8.39	<.001	3
Sex	.057	1.46	>.05	
Age	.02	.433	>.05	
Children under 18	-.028	-.74	>.05	
Always Lived with Pets	.107	2.65	<.05	5
Parents' Marital Status	-.003	-.09	>.05	

VITA AUCTORIS

Beth Daly was born in Chicago but grew up in Windsor. She obtained both a B.A. and an M.A. in English from the University of Windsor, and a B.Ed. from the University of Western Ontario. After 6 years of teaching elementary school, she returned to the University of Windsor and earned a Ph.D. in Educational Studies from the Faculty of Education, where she is now an Assistant Professor. She lives in Windsor with her yellow Labrador retriever, Huckleberry.